



GUIDANCE SELECTION FOR
**POWER DEVICE
& INTEGRATED CIRCUIT**

Focusing on the R&D and Sales of High-End Power Device and Integrated Circuit



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01 POWER DEVICE

The company's independently developed power devices feature high voltage and high current handling capabilities, capable of withstanding high power consumption. They also offer low on-current, reducing energy loss and improving efficiency. Their fast switching speeds allow for rapid transitions between on and off states. These products are widely used in special equipment, automotive, industrial control, new energy, and wireless communications.

Product Categories

The power device product line includes MCTs, SiC MOSFETs, IGBTs, and MOSFETs for medium, low, and high voltage applications.

Quality Assurance Grades

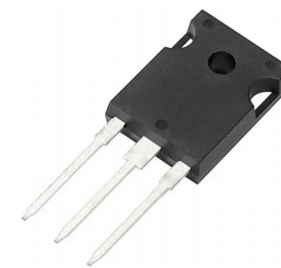
Industrial Grade: Meets industrial-grade electronic product requirements – no letter;

Military Temperature Grade: Meets requirements for in-vehicle and ground equipment–Z Grade;

Enterprise Military Grade: Meets special military or customized requirements–JP Grade.

SiC MOSFET

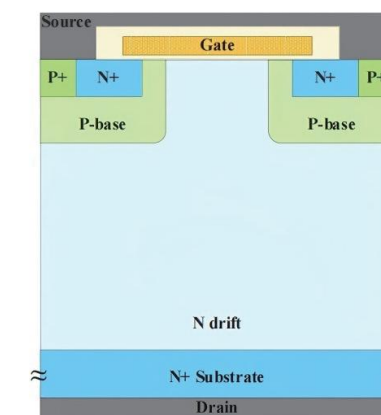
Product Introduction



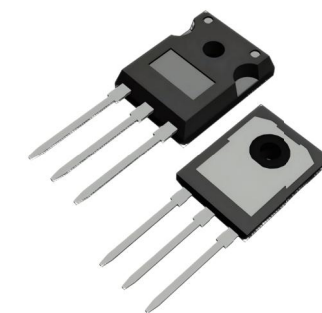
As a third-generation SiC MOSFET series product, it covers voltage grades from 650V to 1700V and is widely used in high-end server power supplies, photovoltaic inverters, motor drives, UPS power supplies, and new energy vehicle charging stations.

Operating Principle

The SiC MOSFET utilizes a vertical conductive structure, with a core consisting of a source (current input), a gate (control terminal), a drain (current output), and a low-doped drift layer (responsible for high-voltage blocking). When conducting, a positive voltage is applied to the gate, forming an N-type conductive channel on the surface of the P-type body region. Electrons are injected from the source through the channel into the drift layer, enabling current flow. When off, the gate voltage drops below the threshold, eliminating the conductive channel and blocking the drain-source current. Remaining carriers complete the shutdown process by recombination or sweeping out of the depletion region.



SiC MOSFET Structural diagram

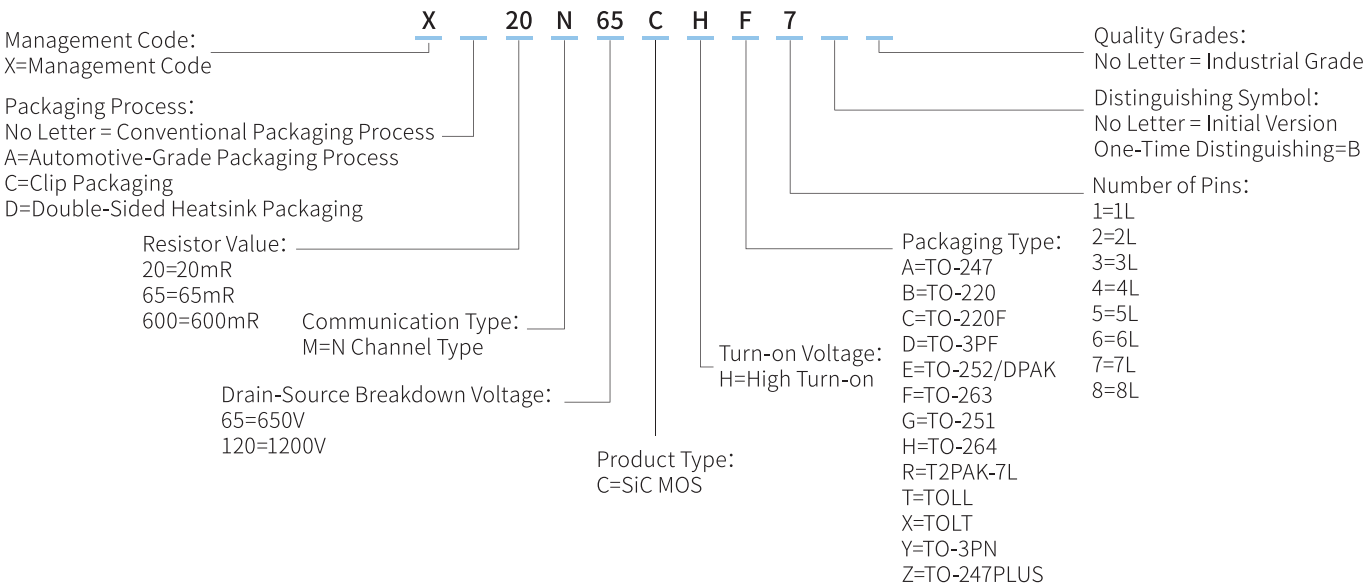


Product Features

High breakdown voltage, high current density

Extremely low switching losses, maximum operating junction temperature of 175°C

Selection Example



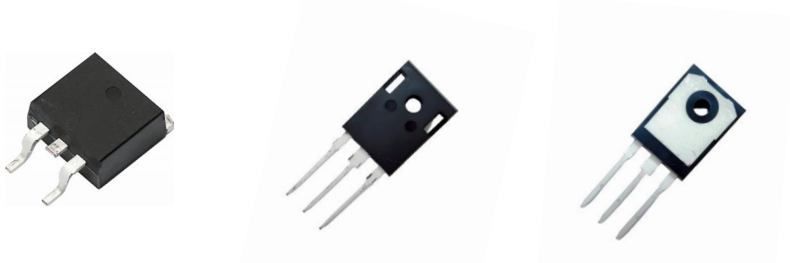
Specifications

Product Model	Drain-Source Voltage	Rated Current	Threshold Voltage (th)	On-current[mΩ] @Vgs=18V		Packaging
				@25°C	@175°C	
				Typical Value	Typical Value	
X20N65CHF7	650	100	-	20	28	TO-263-7L
X40N75CHA4	750	64	2.8	40	57	TO-247-4L
X40N75CHR7	750	64	2.8	40	65	T2PAK-7L
X38N75CHT2	750	64	2.8	38	57	TOLL-2L
X38N75CHF7	750	69	2.8	38	65	TO-263-7L
X25N75CHA4	750	92	2.8	25	38	TO-247-4L
X25N75CHT2	750	92	2.8	25	40	TOLL-2L
X20N75CHT2	750	97	-	20	28	TOLL-2L
X25N75CHF7	750	98	2.8	25	38	TO-263-7L
X12N75CHA4	750	160	2.8	12	20	TO-247-4L
X10N75CHA4	750	172	2.8	10	18	TO-247-4L
X160N120CHA4	1200	20	2.8	-	-	TO-247-4L
X160N120CHA3	1200	20	2.8	-	-	TO-247-3L
X160N120CHF7	1200	21	2.8	-	-	TO-263-7L

Product Model	Drain-Source Voltage	Rated Current	Threshold Voltage (th)	On-current[mΩ] @Vgs=18V		Packaging
				@25°C	@175°C	
				Typical Value	Typical Value	
X60N120CHF7	1200	39	2.8	60	109	TO-263-7L
X69N120CHA4	1200	43	3.1	69	105	TO-247-4L
X60N120CHA4B	1200	44	2.8	60	109	TO-247-4L
X60N120CHA3	1200	44	2.8	60	109	TO-247-3L
X35N120CHA4	1200	65	2.8	35	64	TO-247-4L
X32N120CHA3	1200	73	2.8	32	59	TO-247-3L
X32N120CHR7	1200	75	2.8	32	59	T2PAK-7L
X35N120CHF7	1200	75	2.8	35	64	TO-263-7L
X32N120CHA4D	1200	76	2.8	32	59	TO-247-4L
X32N120CHA4E	1200	76	2.8	32	59	TO-247-4L
X27N120CHA4	1200	87	2.8	27	47	TO-247-4L
X38N120CHA3	1200	88	3.2	38	53	TO-247-3L
X38N120CHA4	1200	88	3.2	38	53	TO-247-4L
X32N120CHA4	1200	92	2.6	32	49	TO-247-4L
X32N120CHA4B	1200	94	3.2	32	47	TO-247-4L
X23N120CHA4	1200	97	2.8	23	42	TO-247-4L
X23N120CHF7	1200	107	2.8	23	42	TO-263-7L
X14N120CHA4	1200	152	2.8	14	27	TO-247-4L
X13N120CHA4C	1200	155	2.8	13	23.7	TO-247-4L
X13N120CHA4B	1200	167	2.9	13	20	TO-247-4L
X13N120CHA3	1200	175	2.8	13	28	TO-247-3L
X37N150CHA4	1500	72	2.8	37	64	TO-247-4L
X600N170CHF7	1700	8.4	2.8	600	900	TO-263-7L
X40N170CHA4	1700	66	3.1	40	48	TO-247-4L
X35N17CHT2	1700	67	2.8	35	80	TOLL-2L
X20N170CHA4	1700	90	3.3	20	41	TO-247-4L
X28N170CHA3	1700	105	3.1	28	38	TO-247-3L

IGBT

Product Introduction



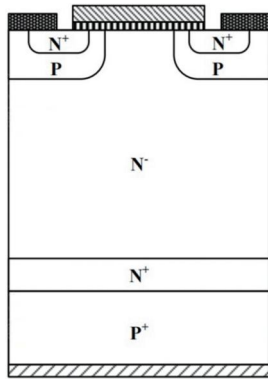
IGBTs are fully controlled, voltage-driven, composite power semiconductor devices composed of a BJT and a MOSFET. They combine the advantages of high input impedance and low on-state voltage drop. They are widely used in servo motors, frequency converters, variable-frequency home appliances, photovoltaic inverters, welding machines, UPSs, on-board charging stations, and other applications.

IGBT products cover multiple series with voltage grades ranging from 650V to 1700V. They offer a wide range of specifications with currents ranging from 5A to 200A. The high-efficiency series, based on Trench Field Stop technology, incorporates the Ultra Thin Wafer Process and localized lifespan control technologies to significantly increase device power density, enabling higher operating temperature tolerance, greater conversion efficiency, and longer lifespan.

Operating Principle

An IGBT is a fully controlled, voltage-driven power device that combines a MOSFET and a BJT. Its core structure consists of four semiconductor layers (P+/N-/P/N+). The gate voltage controls the formation of a conductive channel. When a positive voltage is applied to the gate, a channel forms in the MOSFET portion, allowing electrons to inject into the N+ drift region and simultaneously triggering the PNP transistor to conduct, generating a large current. When the device is turned off, the gate voltage decreases, the channel disappears, electron injection ceases, and holes in the drift region gradually recombine to eliminate, blocking the current.

IGBTs combine the high input impedance and fast switching characteristics of MOSFETs with the low on-state voltage drop of BJTs. During conduction, they reduce current and losses through the conductivity modulation effect. Their operation is gate voltage-dependent, with positive voltage turning them on and zero or negative voltage turning them off. They exhibit unidirectional conductivity. IGBTs are widely used in power electronics applications such as inverters, motor control, and new energy, serving as core components for efficient power conversion.



IGBT Structure Diagram

Product Features

- Excellent on-state voltage drop and low switching losses
- Strong short-circuit capability enables higher power density

Selection Example

Management Code: X
X=Management Code

Packaging Process:
No Letter = Conventional Packaging Process
A=Automotive-Grade Packaging Process
C=Clip Packaging
D=Double-Sided Heatsink Packaging

Current Value:
6=6A
65=65A
650=650A
1K2=1200A

Product Type:
G=IGBT

Drain-Source Breakdown Voltage:
065=65V
65=650V
120=1200V

Quality Grades:
No Letter = Industrial Grade

Numbers of Pins:
2=2L
3=3L
4=4L
5=5L
6=6L
7=7L
8=8L

Packaging Type:
A=TO-247
B=TO-220
C=TO-220F
D=TO-3PF
E=TO-252/DPAK
F=TO-263
G=TO-251
H=TO-264
I=SOP-8
X=TOLT
Y=TO-3PN
Z=TO-247PLUS

Turn-on Characteristics:
L = Low Frequency
M = Mid Frequency
H = High Frequency

Sealed Type:
No letter = No Sealed
For Sealed FRD, at Tc = 100°C:
IF/IC = 1, select F;
3/4 ≤ IF/IC < 1, select F2;
1/2 < 1F/IC < 3/4, select F1;
IF/IC = 1/2, select H;
1/4 ≤ IF/IC < 1/2, select H2;
0 < 1F/IC < 1/4, select H1;
C = Sealed SiC SBD;
R = RC IGBT

Specifications

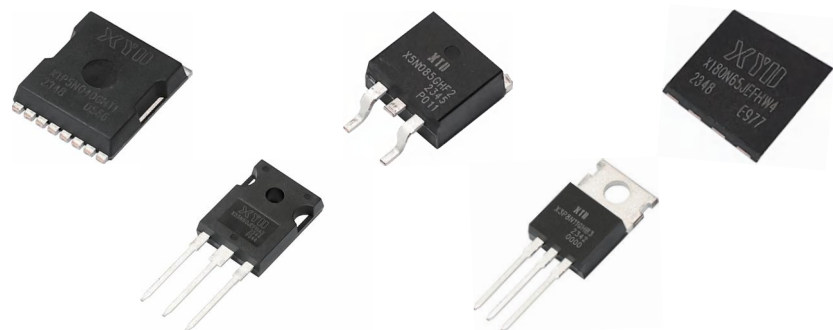
Product Model	Pressure Resistant [V]	Current IC_Tc=100°C [A]	Freewheeling Diode IF_Tc=100°C [A]	Turn-on Frequency [KHZ]	Packaging
X5G65FLE2	650	5	5	1~16	TO-252-2L
X15G65FMB3	650	15	15	10~30	TO-220-3L
X15G65FMC3	650	15	15	10~30	TO-220F-3L
X20G65FMC3B	650	20	20	10~40	TO-220F-3L
X20G65FMF2	650	20	20	10~40	TO-263-2L
X20G65FMB3	650	20	20	10~40	TO-220-3L
X20G65FMA3	650	20	20	10~40	TO-247-3L
X40G65FMA3	650	40	40	16~40	TO-247-3L
X40G65FMA3B	650	40	40	16~40	TO-247-3L
X40G65FMA3C	650	40	40	16~40	TO-247-3L
X40G65H2MY3	650	40	18	16~40	TO-3P-3L
X40G65FMY3	650	40	45	16~40	TO-3P-3L
X50G65F2MA3	650	50	40	10~30	TO-247-3L
XA50G65FMA3	650	50	50	10~30	TO-247-3L

Product Model	Pressure Resistant [V]	Current IC_Tc=100°C [A]	Freewheeling Diode IF_Tc=100°C [A]	Turn-on Frequency [KHZ]	Packaging
X50G65FMF7	650	50	50	16~40	TO-263-7L
X60G65HMA3B	650	60	30	16~40	TO-247-3L
X60G65F1MA3	650	60	40	16~40	TO-247-3L
X60G65F1MA3B	650	60	40	16~40	TO-247-3L
X60G65FMA3C	650	60	60	16~40	TO-247-3L
X60G65F1MA3C	650	60	40	16~40	TO-247-3L
X60G65F1MA4	650	60	40	16~40	TO-247-4L
X60G65FMA3B	650	60	60	16~40	TO-247-3L
X65G65H2MY3	650	65	20	16~40	TO-3P-3L
XA75G65H2LA3	650	75	30	1~16	TO-247-3L
X75G65FMA3	650	75	75	16~40	TO-247-3L
X75G65FMA3C	650	75	75	16~40	TO-247-3L
X75G65FMA3D	650	75	75	10~30	TO-247-3L
X75G65FMA3E	650	75	75	16~40	TO-247-3L
X75G65FMA3F	650	75	75	16~40	TO-247-3L
X80G65FMA3	650	80	80	16~40	TO-247-3L
X100G65FMA3B	650	100	100	10~30	TO-247-3L
X100G65FMZ3	650	100	100	10~30	TO-247PLUS-3L
X160G65FLZ3	650	160	160	1~16	TO-247PLUS-3L
X200G75FLZ3	750	200	200	1~16	TO-247PLUS-3L
X10G120FLA3	1200	10	10	1~16	TO-247-3L
X15G120FLA3	1200	15	15	1~16	TO-247-3L
X25G120FLA3	1200	25	25	1~16	TO-247-3L
X25G120F1MA3	1200	25	15	16~40	TO-247-3L
X25G120H2MA3	1200	25	10	16~40	TO-247-3L
XA40G120FMA3	1200	40	40	10~30	TO-247-3L
X40G120FMA3B	1200	40	40	10~30	TO-247-3L

Product Model	Pressure Resistant [V]	Current IC_Tc=100°C [A]	Freewheeling Diode IF_Tc=100°C [A]	Turn-on Frequency [KHZ]	Packaging
X40G120FLF2	1200	40	40	1~16	TO-263-2L
XA40G120FLA3	1200	40	40	1~16	TO-247-3L
XA40G120FLA3B	1200	40	40	1~16	TO-247-3L
X50G120FMA3	1200	50	50	10~30	TO-247-3L
X50G120FLA3	1200	50	50	1~16	TO-247-3L
X75G120FMZ3	1200	75	75	10~30	TO-247PLUS-3L
X75G120FLZ3	1200	75	75	1~16	TO-247PLUS-3L
X100G120FMZ3	1200	100	100	10~30	TO-247PLUS-3L
X140G120FLZ3	1200	140	140	1~16	TO-247PLUS-3L
X40G170FLA3	1700	40	40	1~16	TO-247-3L

MOSFET

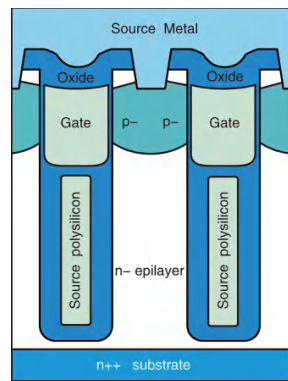
Product Introduction



The MOSFET series covers voltage grades from -100V to 1500V. Utilizing advanced manufacturing techniques, superior process conditions, and meticulously optimized device structures, this series undergoes continuous product optimization and iteration. Featuring low on-current, high performance, high efficiency, high cost-effectiveness, and high reliability, it is widely used in power supply applications such as power switches, synchronous rectification, BMS, motor drives, and industrial switches.

Operating Principle

MOSFETs are core components for efficient power control. They regulate the conductive channel between the source and drain electrodes through gate voltage, enabling current on/off and current regulation. They require no gate current and consume very little power. Their high-frequency switching, high-voltage withstand, and high-current characteristics make them widely used in power supplies, motor drives, and new energy applications. They provide precise power management for devices, helping to improve system efficiency and stability, and serve as the "power control valve" of modern electronic devices.



SGT Structure Diagram

Product Features

Lower Figure of Merit (FOM = $R_{os(on)} \times Q_g$), faster switching speed
Strong shock current, high avalanche current, and high reliability

Selection Example

Management Code: X Management Code

Packaging Process:
No Letter = Conventional Packaging Process
A=Automotive-Grade Packaging Process
C=Clip Packaging
D=Double-Sided Heatsink Packaging

Resistor Value/Current Value:
TR MOS、SGT MOS、SJ MOS Instead of Resistor Value
P65=0.65mR
1P6=1.6mR
6=6mR
65=65mR
650=650mR
1K2=1200mR
VD Technique Instead of Current Value
P65=0.65A
1P6=1.6A
6=6A
65=65A
650=650A
1K2=1200A

Communication Type:
N=N Channel Type
P=P Channel Type

Drain-Source Breakdown Voltage:
065=65V
65=650V
120=1200V

Turn-on Voltage:
L=Low Turn-on
H=High Turn-on

Product Type:
D=VD MOS
G=SGT MOS
J=SJ MOS
T=TR MOS

Quality Grades:
No Letter = Industrial Grade

Packaging Type:
A=TO-247
B=TO-220
C=TO-220F
E=TO-252/DPAK
F=TO-263
I=SOP-8
K=DFN5*6
M=SOT-23/SOT23-3
P=TO-220CB
Q=TO-220MF
T=TOLL
U=PDFN3*3/3.3*3.3
V=PDFN5*6
Y=TO-3PN
Z=TO-247PLUS
AC=DFN2*2
ME=SOT-363
MF=SOT-523
MG=SOT-723

Number of Pins:
2=2L
3=3L
4=4L
5=5L
6=6L
7=7L
8=8L

Specifications(P Tube)

Product Model	Drain-Source Voltage	Rated Current	Threshold Voltage (th)	On-current[mΩ] @Vgs=				Packaging
	[V]	[A]@25°C	[V]@25°C	-10V		-4.5V		
			Typical Value	Typical Value	Maximum Value	Typical Value	Maximum Value	
HJ52P10TLE2	-100	-28	-1.8	40	52	42	56	TO-252-2L
X108P060TLM3	-60	-6	-1.8	83	108	103	136	SOT-23
X160P060TLM3	-60	-1.6	-1.8	120	160	160	240	SOT-23
X6KP050TLM3	-50	-0.18	-1.6	2300	6000	2700	7000	SOT-23
X5KP050TLM3	-50	-0.13	-1.4	1700	5000	1900	6000	SOT-23
X35P040TLM6	-40	-7	-1.5	28	35	38	50	SOT-23-6L
X88P040TLM3	-40	-5	-1.5	61	88	81	100	SOT-23
X140P040TLM3	-40	-2.7	-2	101	140	150	200	SOT-23
X13P030TLU8	-30	-35	-1.5	8	13	11	22	PDFN3.3*3.3-8L
X12P030TLI8	-30	-12	-1.6	7	12	11	15	SOP8
X65P030TLM3	-30	-4.2	-0.9	50	65	60	75	SOT-23
X50P030TLM3	-30	-4.2	-0.9	33	50	40	60	SOT-23-3L
X88P030TLM3	-30	-2.7	-1.5	73	88	110	138	SOT-23

Product Model	Drain-Source Voltage	Rated Current	Threshold Voltage (th)	On-current[mΩ] @Vgs=				Packaging
	[V]	[A]@25°C	[V]@25°C	-10V		-4.5V		
			Typical Value	Typical Value	Maximum Value	Typical Value	Maximum Value	
X150P030TLM3	-30	-1.9	-1.5	85	150	125	250	SOT-23
X50P020TLM3	-20	-4	-0.65	-	-	33	50	SOT-23
X112P020TLM3	-20	-2.3	-0.7	-	-	70	112	SOT-23
X45P012TLM3	-12	-4.1	-0.65	-	-	30	45	SOT-23

Specifications(N Tube-Medium and Low Pressure)

Product Model	Drain-Source Voltage	Rated Current	Threshold Voltage (th)	On-current[mΩ] @Vgs=				Packaging
	[V]	[A]@25°C	[V]@25°C	-10V		-4.5V		
			Typical Value	Typical Value	Maximum Value	Typical Value	Maximum Value	
X260N020TLMG3	20	0.75	0.7	-	-	170	260	SOT-723
X42N020TLM3	20	3.5	0.95	-	-	32	42	SOT-23
X32N020TLM3B	20	6	0.7	-	-	17	32	SOT-23
X19N020TLM3	20	7	0.8	14	19	16	22	SOT-23
X2N030TLV8	30	270	1.7	1.3	2	2.6	4	PDFN5*6-8L
X60N030TLM3	30	3.3	1.55	37	60	57	75	SOT-23
X35N030TLM3B	30	5.8	0.9	25	35	27	40	SOT-23
X27N030TLM3B	30	5.8	1	20	27	22	30	SOT-23-3L
X30N030TLAC6	30	6	1.7	18	30	24	42	DFN2*2-6L
X3P5N040TLE2	40	180	1.6	2.2	3.5	2.9	5	TO-252-2L
X1P4N040GLV8	40	290	1.7	1.2	1.4	2.3	3	PDFN5*6-8L
X2P2N040GLV8	40	150	1.8	1.7	2.2	2.5	3	PDFN5*6-8L
X2P2N040GLE2	40	186	1.8	1.7	2.2	2.8	3.5	TO-252-2L
XC1P5N040GLV8	40	225	1.8	1.2	1.5	2	2.5	PDFN5*6 Clip-8L
XC1P1N040GLV8	40	280	1.8	0.9	1.1	1.35	1.8	PDFN5*6 Clip-8L
X1P4N040GHV8	40	245	3	1.1	1.4	1.7	2.3	PDFN5*6-8L
X1P8N040GHP3	40	285	3	1.5	1.8	-	-	TO-220CB-3L

Product Model	Drain-Source Voltage	Rated Current	Threshold Voltage (th)	On-current[mΩ] @Vgs=				Packaging
	[V]	[A]@25°C	[V]@25°C	-10V		-4.5V		
			Typical Value	Typical Value	Maximum Value	Typical Value	Maximum Value	
X1P5N040GHT1	40	287	3	1.2	1.5	-	-	TOLL-1L
X1P4N040GHV8B	40	380	3	1.2	1.4	-	-	PDFN5*6-8L
XC1P6N045GHV8	45	216	3	1.3	1.6	-	-	PDFN5*6 Clip-8L
X3K5N050TLM3	50	0.22	1.2	880	3500	1500	6000	SOT-23
X2K5N050TLM3	50	0.34	1.1	900	2500	1000	6000	SOT-23
X2K5N050TLME6	50	0.34	1.1	800	2500	850	3000	SOT-363
X2K5N060TLMF3	60	0.34	1.5	850	2500	950	3000	SOT-523
X2K5N060TELMF3	60	0.34	1.5	900	2500	1100	3000	SOT-523
X2K5N060TLME6	60	0.34	1.5	850	2500	950	3000	SOT-363
X2K5N060TELME6	60	0.34	1.5	900	2500	1100	3000	SOT-363
X2K5N060TLM3B	60	0.34	1.3	900	2500	1100	3000	SOT-23
X3N060GLV8	60	120	1.6	2.5	3	4.2	5.4	PDFN5*6-8L
X7P2N060GLI8	60	18	1.7	6.2	7.2	8.2	10.7	SOP-8L
X3P5N060GLQ3	60	113	1.75	2.55	3.5	3.7	4.8	TO-220MF-3L
X3P5N060GLP3	60	160	1.75	2.55	3.5	3.7	4.8	TO-220CB-3L
X2P8N060GLE2	60	180	1.8	2.3	2.8	3.1	4	TO-252-2L
X2P8N060GLV8	60	180	1.8	2.3	2.8	3.1	4	PDFN5*6-8L
X1P5N060GHT1	60	356	2.7	1.1	1.5	-	-	TOLL-1L
X90N060TLM3	60	3	1.2	70	90	82	123	SOT-23
XC1P5N060GHV8	60	209	3	1.3	1.5	-	-	PDFN5*6 Clip-8L
X4KN100TLM3	100	0.17	1.8	2100	4000	2200	5000	SOT-23
X250N100TLM3	100	2	1.5	195	250	208	270	SOT-23
X23N10GLI8	100	8	1.7	19	23	26	34	SOP-8L
X11N10GLU8	100	42	1.7	9.1	11	12	15	PDFN3*3-8L
HJ8N10GHV8	100	85	3	6.5	8	-	-	PDFN5*6-8L
X8N10GHV8	100	85	3	6.5	8	-	-	PDFN5*6-8L
X8N10GLV8	100	97	1.8	6	8	8.5	11	PDFN5*6-8L

Product Model	Drain-Source Voltage	Rated Current	Threshold Voltage (th)	On-current[mΩ] @Vgs=				Packaging
	[V]	[A]@25°C	[V]@25°C	-10V		-4.5V		
			Typical Value	Typical Value	Maximum Value	Typical Value	Maximum Value	
XC3P8N10GHV8	100	140	3	3	3.8	-	-	PDFN5*6 Clip-8L
X4N10GHP3	100	155	3	3.2	4	-	-	TO-220CB-3L
X4P1N10GLB3	100	190	1.7	3.6	4.1	4.7	5.5	TO-220-3L
X3N10GHP3	100	199	3	2.4	3	-	-	TO-220CB-3L
X3N10GHF6B	100	219	2.9	2.3	3	3	4	TO-263-6L
X3P2N10GHX1	100	220	2.9	2.5	3.2	-	-	TOLT
X2P4N10GHT1	100	224	3	2	2.4	-	-	TOLL-1L
X3N10GHB3B	100	239	3	2.6	3	3.4	5	TO-220-3L
X2P7N10GHX1	100	270	2.9	2.1	2.7	-	-	TOLT
X2N10GHT1B	100	348	2.9	1.7	2	-	-	TOLL-1L
X1P6N10GHT1	100	349	3	1.3	1.6	-	-	TOLL-1L
X1P5N10GHT1	100	370	3	1.2	1.5	-	-	TOLL-1L
X1P5N10GHF6	100	420	3	1.2	1.5	-	-	TO-263-6L
X1P3N10GHT1	100	460	2.75	1.2	1.3	-	-	TOLL-1L
X3P3N11GHT1	110	224	3.3	2.6	3.3	-	-	TOLL-1L
X4P7N12GHP3	120	144	3	3.9	4.7	-	-	TO-220CB-3L
X12N15GHV8	150	94	3	9.3	12	-	-	PDFN5*6-8L
X7P5N15GHF6	150	113	3	6.2	7.5	-	-	TO-263-6L
X7P5N15GHT1	150	132	2.8	6.2	7.5	-	-	TOLL-1L
X6P5N15GHP3	150	160	3	5.4	6.5	-	-	TO-220CB-3L
X4N15GHA3	150	320	3	3.6	4	-	-	TO-247-3L
X99N20GHU8	200	12.7	3.4	82	99	-	-	PDFN3*3-8L

Specifications(N Tube-High Pressure)

Product Model	Drain-Source Voltage	Rated Current	Threshold Voltage (th)	On-current[mΩ] @Vgs=18V		Packaging
	[V]	[A]@25°C	[V]@25°C	@25°C	@175°C	
			Typical Value	Typical Value	Typical Value	
X7N40DHC3	400	7	3	1080	1350	TO-220F-3L
X7N40DHE2	400	7	3	1170	1300	TO-252-2L
X10N40DHC3	400	10	3	470	690	TO-220F-3L
X12N40DHC3	400	12	3.3	330	450	TO-220F-3L
X28N40DHA3	400	28	3.3	120	160	TO-247-3L
X4N50DHE2	500	4	3.2	1500	1700	TO-252-2L
X7N50DHC3	500	7	2.9	700	900	TO-220F-3L
X7N50DHE2	500	7	3	700	900	TO-252-2L
X10N50DHC3	500	10	2.9	470	800	TO-220F-3L
X13N50DHC3	500	13	2.7	360	500	TO-220F-3L
X18N50DHC3	500	18	3	280	340	TO-220F-3L
X20N50DHC3	500	20	3.2	240	320	TO-220F-3L
X28N50DHA3	500	28	3	170	240	TO-247-3L
X40N50DHA3	500	40	2.7	88	100	TO-247-3L
X40N50DHY3	500	40	2.6	90	100	TO-3PN-3L
X7N60DHC3	600	7	2.9	1000	1300	TO-220F-3L
X7N60DHE2	600	7	3	1000	1300	TO-252-2L
X10N60DHC3	600	10	2.9	700	900	TO-220F-3L
X12N60DHC3	600	12	3	640	750	TO-220F-3L
X16N60DHC3	600	16	3.3	380	560	TO-220F-3L
X20N60DHC3	600	20	2.9	320	460	TO-220F-3L
X28N60DHA3	600	28	3.2	250	400	TO-247-3L
X4N65DHE2	650	4	2.9	2400	2900	TO-252-2L
X5N65DHE2	650	5	3.1	2300	2800	TO-252-2L
X600N65JMHE2	650	7	3	500	600	TO-252-2L

Product Model	Drain-Source Voltage	Rated Current	Threshold Voltage (th)	On-current[mΩ] @Vgs=18V		Packaging
	[V]	[A]@25°C	[V]@25°C	@25°C	@175°C	
			Typical Value	Typical Value	Typical Value	
X7N65DHC3	650	7	2.8	1200	1500	TO-220F-3L
X8N65DHC3	650	8	3	1100	1400	TO-220F-3L
X10N65DHC3	650	10	3.3	800	1100	TO-220F-3L
X12N65DHC3	650	12	2.8	500	800	TO-220F-3L
X16N65DHC3	650	16	3.3	450	650	TO-220F-3L
X20N65DHC3	650	20	3.3	380	530	TO-220F-3L
X4N70DHE2	700	4	3.4	2900	3000	TO-252-2L
X7N70DHC3	700	7	3.3	1400	1800	TO-220F-3L
X10N70DHC3	700	10	3.3	1000	1200	TO-220F-3L
X12N70DHC3	700	12	3.3	750	1000	TO-220F-3L
HJ6N90DHB3	900	6	4	1700	2300	TO-220-3L
X6N90DHC3	900	6	4	1700	1900	TO-220F-3L
X6N90DHF2	900	6	4	1800	1900	TO-263-2L
X9N90DHA3	900	9	3.8	1000	1200	TO-247-3L
X12N90DHA3	900	12	3.8	730	880	TO-247-3L
X24N90DHZ3	900	24	3.7	300	500	TO-247-PLUS
X9N100DHA3	1000	9	4	1150	1490	TO-247-3L
X3N150DHY3	1500	3	3.8	5300	8000	TO-3PF-3L

MCT

Product Introduction



The MCT (XM30N18T2) is a voltage-driven, compact, high-power, solid-state pulse switch. It features high blocking voltage, high forward and reverse pulse peak current capability, and simple operation. It can be used in applications such as capacitor discharge units, high-power pulse power supplies, and electronic fuses.

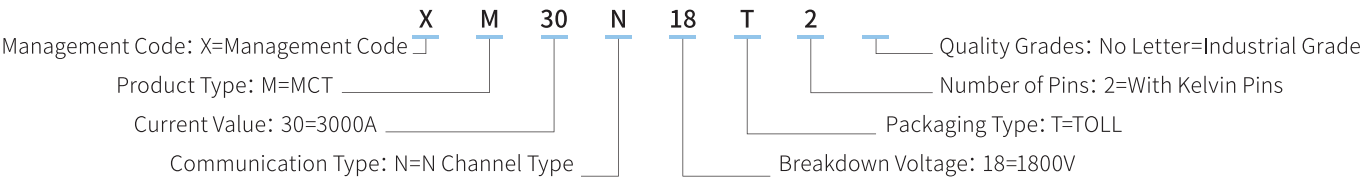
Operating Principle

An MCT is a thyristor based on MOSFET gate control. This MOSFET gate-controlled pulse power device combines the MOSFET and thyristor structures, utilizing the on/off behavior of the MOSFET to control the conduction and shutdown of the thyristor. When the gate voltage is positive, the NMOSFET conducts, generating an electron current that flows into the N-drift region. This current serves as the thyristor's trigger current, turning the device on. When the gate voltage is negative, the PMOSFET conducts, forming a hole conduction channel that short-circuits the PN junction between the N cathode region and the P-type base region. This draws the charge stored in the P-base region to the cathode, disrupting the positive feedback loop within the thyristor and turning the device off.

Product Features

0V shutdown, strong anti-interference

Selection Example



Specifications

Maximum Withstand Voltage (Test Conditions Tj=25°C)

Product Model	V(BR)AK	Repetitive Forward Peak Current	Shelf-to-cathode Threshold Voltage	Packaging
	[V]	[A]@25°C	[V]	
			Typical Value	
XM30N18T2	1800	3000	4	TOLL-2L

Parameter	Maximum	Value Unit
Maximum Anode-Cathode Breakdown Voltage	1800	V
Maximum Off-State Voltage Rise Rate	1000	V/ μ s
Maximum Single Forward Peak Current (Half-Cycle Sine Pulse Width = 1 μ s)	3500	A
Maximum Repetitive Forward Peak Current (Half-Cycle Sine Pulse Width = 1 μ s)	3000	A
Maximum Repetitive Reverse Peak Current (Half-Cycle Sine Pulse Width = 1 μ s)	500	A
Maximum On-State Current Rise Rate	50	kA/ μ s
Maximum Gate-Cathode Voltage (Continuous)	± 20	V
Maximum Gate-Cathode Voltage (Peak)	± 25	V
Pin Soldering Temperature (During Soldering, 5 Seconds) (Th)	260	$^{\circ}$ C
Junction Temperature Range (Tj)	125	$^{\circ}$ C
Storage Temperature Range (TStg)	150	$^{\circ}$ C

Recommended Operating Conditions

Parameter	Minimum Value	Maximum Value	Unit
Recommended Operating Temperature Range	-55	85	$^{\circ}$ C

Electrical Parameters (Test Conditions: Tj = 25 $^{\circ}$ C)

Parameter	Symbol	Test Conditions	Minimum Value	Typical Value	Maximum Value	Unit
Anode-Cathode Breakdown Voltage	V(BR)AK	VGK =0V, IAK(off) =1mA	1800	-	-	V
Anode-Cathode Leakage Current	IAK(off)	VGK =0 V,VAK =1800V	-	15	100	μ A
Gate-Cathode Leakage Current	IGK	VGK = ± 30 V, VAK =0V	-	-	± 500	nA
Gate-Cathode Threshold Voltage	VGK(th)	VAK =VGK, IAK =1mA	-	4	-	V
Anode-Cathode Saturation Voltage Drop	VAKsat	VGK =15V, IAK =50A	-	2.4	-	V
Current Change Rate	Di/dt	C=0.22 μ F, L=28nH,	-	43	-	kA/ μ s
Peak Anode Current	Ip	VGK =7V, VAK =1600V	-	3000	-	A

Module

Product Introduction



The modules cover IGBT and diode types, with withstand voltages from 400V to 1700V and currents from 10A to 3600A. They utilize IHM-B and EconoDUAL3 packages, offering high integration and low losses. These modules are widely used in industrial drives, power management, and new energy applications. They efficiently convert energy to meet diverse power requirements, satisfying the high efficiency and reliability demands of diverse scenarios.

Operating Principle

Utilizing the switching characteristics of semiconductor power devices, various topological combinations achieve corresponding circuit functions, reducing the complexity of external circuitry and improving system integration and reliability.

By controlling the on/off state of switching devices such as IGBTs through gate voltage, electrical energy is switched on and off, enabling conversion (e.g., DC to AC). The diode module acts as a freewheeling element, providing a path for inductive current when the switch is off, preventing overvoltage damage.

Product Features

High voltage and high power, integrated power modules, simplified system design.

Selection Example

Management Code:
X = Management Code
HJ = Management Code

Product Type:
D = Diode Module
G = IGBT Module
T = Thyristor Module
M = IPM Module
S = SiC Module

Topological Form:
F = Half-Bridge
Z = Single Switch
S = Three-Phase Full-Bridge
P = Power Integrated Module (PIM)
(Three-Phase Rectifier + Brake + Three-Phase Full-Bridge)
B = Power Integrated Module
(Single-Phase Rectifier + Three-Phase Full-Bridge)
R = Switched Reluctance Module
F4 = H-Bridge
D = Chopper Module
K = Diode Module
3L = Three-grades Module

Current Grades:
400=400A

Separator:
R/H is used as the separator.
If the module is all Si/SiC, use R.
If the module is a mixed Si/SiC, use H.

X

G

F

400

R/H

12

B

A2

V2

Quality Grade:
No Letter = Industrial Grade

Product Version:
No numbers = First Edition
2 = Second Edition

Chip Version:
Letters indicate topologically
supplemented structural variants;
Numbers indicate chip version.

Package Type:
A=Module Package-34mm
B=Module Package-62mm
H1...=IHM、IHM-B
J1...=IHV、IHV-B
K1..K3=Easy PIM1B...3B
L2...3=Econo PIM2...3
M2...3=EconoDUAL2...3
N1...4=EconoPACK1...4
P=PrimePARKTM
W1...2 Easy PACK1...2

Specifications

Product Model	Product Type	Topological Form	Parameter	Packaging
XZ3600R17H1	IGBT Module	Single Switch	1700V 3600A	IHM-B
XGF450R17M3V2	IGBT Module	Single Switch	1700V 450A	EconoDUAL3
XGF600R12M3V2	IGBT Module	Single Switch	1200V 600A	EconoDUAL3
XGP10R12K1	IGBT Module	Power Integrated Module	1200V 10A	EasyPIM 1B
XGP15R12K1V3	IGBT Module	Power Integrated Module	1200V 15A	EasyPIM 1B
X120F40M4	Diode Module	Diode Module	400V 2*120A	SOT-227
X30F40M4	Diode Module	Diode Module	400V 2*30A	SOT-227
X100F40M4	Diode Module	Diode Module	400V 2*60A	SOT-227
X12F40M4	Diode Module	Diode Module	400V 2*12A	SOT-227
X70F40M4	Diode Module	Diode Module	400V 2*70A	SOT-227
X15F40M4	Diode Module	Diode Module	400V 2*15A	SOT-227
X140F40M4	Diode Module	Diode Module	400V 2*140A	SOT-227

02INTEGRATED CIRCUIT

The company provides independently developed integrated circuit products with reliable performance. They are currently widely used in data acquisition, battery power supply, embedded system power management, industrial control and other fields, and can meet the application requirements of various fields.

Product Introduction

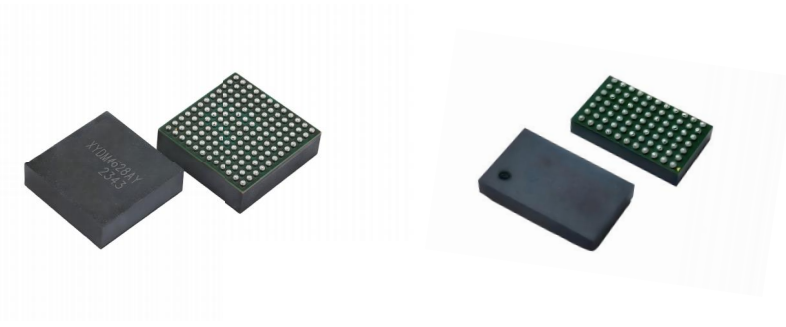
The company offers the 46 series of power modules, LDO linear regulators, and storage products. The 46 series is highly efficient and stable, while the LDOs offer high current and low noise, high-capacity FLASH storage, and industrial-grade reliability. DDR supports high-speed transmission for high-performance scenarios. The full product line covers consumer, industrial, and automotive applications, ensuring stable device operation.

Quality Assurance Grades

- Industrial Grade: Meets the requirements of industrial-grade electronic products (no letter);
- Military Temperature Grade: Meets the requirements of automotive and ground equipment (Grade Z);
- Enterprise Military Grade: Meets special military or customized requirements (Grade N1).

Micro Power Module 46 Series

Product Introduction

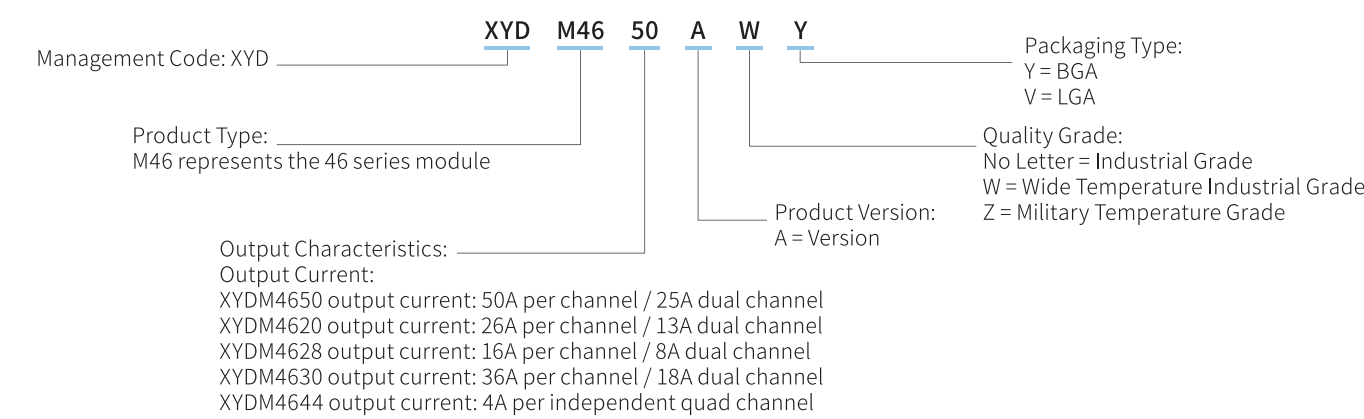


The POL is a SiP power management solution utilizing a compact surface-mount BGA package for easy installation and space-saving design. As a DC/DC converter specifically designed for use near LSIs, it accurately converts high voltage to low voltage to meet the power supply needs of electronic devices. Its wide input voltage range ensures stable operation in a variety of complex power supply environments, making it widely used in industrial control, communications equipment, and other fields.

Product Features

High reliability, high-precision control, and miniaturization

Selection Example



Specifications

Product Model	Functional Description	Input Voltage [V]	Output Voltage [V]	Output Current	Packaging
XYDM4613Y	Up to 36V Input, Up to 15V Output, 8A Output, DC/DC Micromodule Regulator	5~36	3.3~15	Single Channel 8A	BGA133
XYDM4620Y	Dual-Channel 13A or Single-Channel 26A DC/DC Micromodule Regulator	4.5~16	0.6~5.5	Dual Channel 13A or Single Channel 26A	BGA144
XYDM4622Y	Dual-Channel Ultra-Thin 2.5A or Single 5A Step-Down DC/DC Micromodule Regulator	3.6~20	0.6~5.5	Dual Channel 2.5A or Single Channel 5A	BGA25
XYDM4628AY	Dual-Channel 8A or Single-Channel 16A/DC Micromodule Regulator	4.5~26.5	0.6~5.5	Single Channel 16A or Dual Channel 8A	BGA144
XYDM4630Y	Dual-Output 18A or Single-Output 36A/DC Micro-module Regulator	4.5~16	0.6~5.5	Dual Channel 18A or Single Channel 36A	BGA144
XYDM4644Y	Four-Channel DC/DC Micromodule Regulator with Configurable 4A Output Array	4~14	0.6~5.5	Single Channel 4A Output or Multi-channel Cascaded Maximum Output 16A	BGA77
XYDM4644TY	Four-Channel DC/DC Micromodule Regulator with Configurable 4A Output Array, Thin Package	4~14	0.6~5.5	Single Channel 4A Output or Multi-channel Cascaded Maximum Output 16A	BGA77
XYDM4650Y	Dual-Channel 25A or Single-Channel 50A DC/DC Micromodule Regulator	4.5~15	0.6~1.8	Dual Channel 25A or Single Channel 50A Output	BGA144
XYDM4650AY	Independent Dual-Channel 25A or Single-Channel 50A Step-Down DC/DC Micromodule Regulator	4.5~16	0.6~5.5	Dual Channel 25A or Single Channel 50A Output	BGA144

LDO

Product Introduction

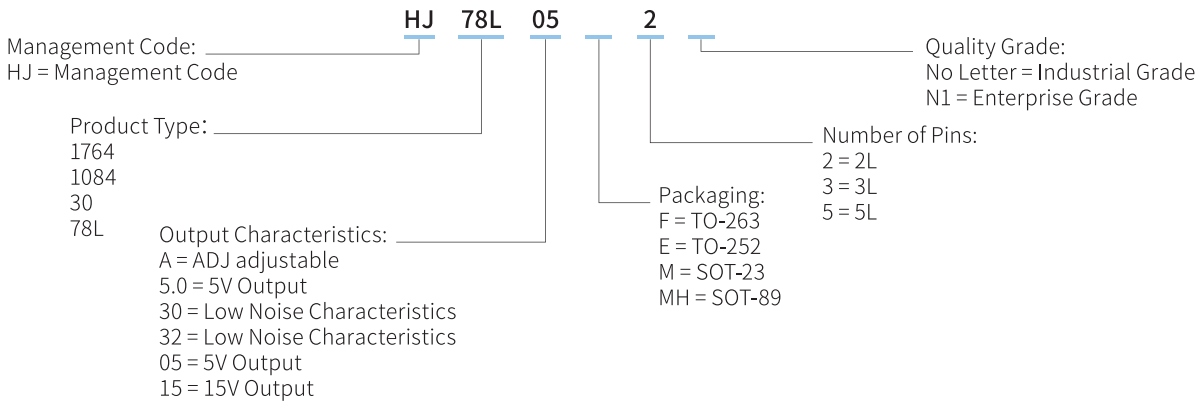


The LDO series of chips are high-performance power management devices. Featuring an extremely low voltage dropout, they operate stably even when the input and output voltages are close, effectively reducing power consumption. They also offer high-precision voltage regulation, ensuring stable and reliable output voltage. Their highly innovative design architecture provides high-performance power for RF and sensor systems, with excellent ripple suppression and fast transient response, making them suitable for a wide range of electronic devices with demanding power requirements.

Product Features

Low noise, low dropout voltage, high power supply rejection.

Selection Example



Specifications

Product Model	Input Voltage	Output Voltage	Power Supply Rejection Ratio	Quiescent Current	Maximum Output Current	Packaging
	[V]	[V]	[dB]	[mA]	[A]	
HJ3030	2.4~20	0.5~16	120 (@f=100Hz)	3.2	0.2	DFN10-EP
HJ3032	2.7~20	1.2~ $V_{IN}-V_{DO}$	100(@f=10 Hz)	1	0.3	SOT-23-5L
HJ1764A	2.7~20	ADJ	55(@f=120Hz)	1	3	TO-263-5L
HJ1084-5.0	2.75~20	5	60(@f=120Hz)	5	5	TO-252-3L
HJ78L05	25	5	62(@f=120Hz)	3	0.1	SOT-89-3L
HJ78L15	36	15	39(@f=120Hz)	3	0.1	SOT-89-3L

Flash

Product Introduction



Flash, as a widely used non-volatile memory product, retains data during power outages and maintains data integrity without requiring an additional power supply. It offers relatively fast read and write speeds, enabling efficient data storage and retrieval operations, thereby meeting the demand for rapid data processing in numerous devices. Flash is commonly employed in mobile devices such as smartphones and tablets for storing system and user data. Simultaneously, it plays a critical role in fields like industrial control and mobile devices, providing reliable data storage solutions for equipment.

Product Features

non-volatile storage with high capacity, fast read/write speeds, and high reliability

Selection Example

Management Code:
X = Management Code

Product Type:
25=SPI Flash Memory
29G=Parallel Flash Memory

Types:
Q=Quad I/O
D=Dual I/O
B=Quad I/O, QE= 1
FQ=Quad I/O ,
High-Performance
T=Quad I/O ,
High-Performance,
High-Reliability
X=Qctal I/O ,
High-Performance,
High-Reliability

Capacitance:
05=512Kbit
10= 1Mbit
20=2Mbit
40=4Mbit
80=8Mbit
16= 16Mbit
32=32Mbit
64=64Mbit
128=128Mbit
256/257=256Mbit
512/M512/M513=512Mbit
1G/M1G/M1G1=1Gbit
M2G=2Gbit
512=512Mbit (single die)
1G= 1Gbit (Stacked 512Mb)
2G=2Gbit (Stacked 512Mb)

Product Version:
A= 65/55nm Version
B= 65/55nm Version
C= 65/55nm Version
E= 48/50nm Version
(improvement)
F= 48/50nm Version
G= 55nm Version

Voltage:
S=2.7V3.6V/
2.3V- 3.6V
L=1.65V2.0V
W=1.65V-3.6V
U= 2.5V-3.6V
X= 2.0V-3.6V

Packaging Form:
D=USON60.72*1.0mm(0.45mm)
F=SOP16 300mil
I=USON6 0.7*1.0mm(0.5mm)
J=USON6 0.7*1.2mm(0.5mm)
K=USON8 2*3mm(0.75mm)
L=WLCSP
M=USON82*3mm(0.50mm)
O=TSSOP8 173mil
Q=USON8 4*4mm
S=SOP8 208mil
T=SOP8 150mil
U=USON8 2*3mm(0.55mm)
V=VSOP8 208mil
X=USON8 2*3mm(0.45mm)

Packaging Method:
(T)=Tube
(R)=Tape & Reel
(Y)=Tray

Quality Grade:
I = Industrial Grade

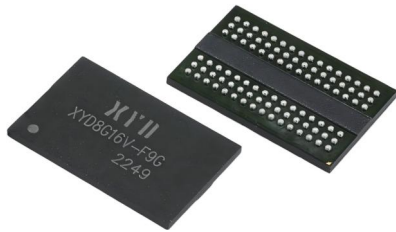
Special Options:
G = Lead-Free with Halogen-Free Eco-Friendly Package
P = Lead-Free with Halogen-Free Green Package and Power Meter or Electricity Meter Application For Power Meter or Electricity
E = Special Application
X = Silver-Free with NiPdAu

Specifications

Product Model	Product Series Model	Product Model	Input	Capacitance	Frequency (MHz)	Packaging
SPI NOR FLASH	X25Q80ES	X25Q80ESSIG	3.3V	8Mb	108(x1,x2,x4)	SOP8-208mil
SPI NOR FLASH	X25Q32ES	X25Q32ESMIG	3.3V	32Mb	120(x1,x2,x4)	USON8-2*3mm
SPI NOR FLASH	X25Q128ES	X25Q128ESSIG	3.3V	128Mb	120(x1,x2,x4)	SOP8-208mil
SPI NOR FLASH	X25Q256FS	X25Q256FSSIG	3.3V	256Mb	100(x1,x2,x4) 50(x4,DTR)	SOP8-208mil
SPI NOR FLASH	X25Q256FS	X25Q256FSWIG	3.3V	256Mb	100(x1,x2,x4) 50(x4,DTR)	WSON -5*6mm
SPI NOR FLASH	X25Q256FS	X25Q256FSEIG	3.3V	256Mb	100(x1,x2,x4) 50(x4,DTR)	WSON -6*8mm
SPI NOR FLASH	X25Q256FS	X25Q256FSFIG	3.3V	256Mb	100(x1,x2,x4) 50(x4,DTR)	SOP16-300mil
SPI NOR FLASH	X25QM512FS	X25QM512FSEIG	3.3V	512Mb	100(x1,x2,x4) 50(x4,DTR)	WSON -6*8mm
SPI NOR FLASH	X25QM512FS	X25QM512FSFIG	3.3V	512Mb	100(x1,x2,x4) 50(x4,DTR)	SOP16-300mil
SPI NOR FLASH	X25FQ256ES	X25FQ256ESFIG	3.3V	256Mb	133(x1,x2,x4)	SOP16-300mil
SPI NOR FLASH	X25FQ32EL	X25FQ32ELSIG	1.8V	32Mb	133(x1,x2,x4)	SOP8-208mil
SPI NOR FLASH	X25FQ128EL	X25FQ128ELSIG	1.8V	128Mb	133(x1,x2,x4)	SOP8-208mil
SPI NOR FLASH	X25FQ128EL	X25FQ128ELWIG	1.8V	128Mb	133(x1,x2,x4)	WSON8-5*6mm
SPI NOR FLASH	X25FQ256EL	X25FQ256ELSIG	1.8V	256Mb	133(x1,x2,x4)	SOP8-208mil
SPI NOR FLASH	X25FQ256EL	X25FQ256ELFIG	1.8V	256Mb	133(x1,x2,x4)	SOP16-300mil
SPI NOR FLASH	X25FQ256EL	X25FQ256ELWIG	1.8V	256Mb	133(x1,x2,x4)	WSON8-5*6mm
Parallel NOR FLASH	X29G1GFS	X29G1GFSEBIG	3.3V	1Gb	x8,x16	TFBGA11*13-64BALL
Parallel NOR FLASH	X29G1GFS	X29G1GFSGIG	3.3V	1Gb	x8,x16	TSOP56 14*20mm
Parallel NOR FLASH	X29GM2GFS	X29GM2GFSEBIG	3.3V	2Gb	x8,x16	TFBGA11*13-64BALL

DDR

Product Introduction

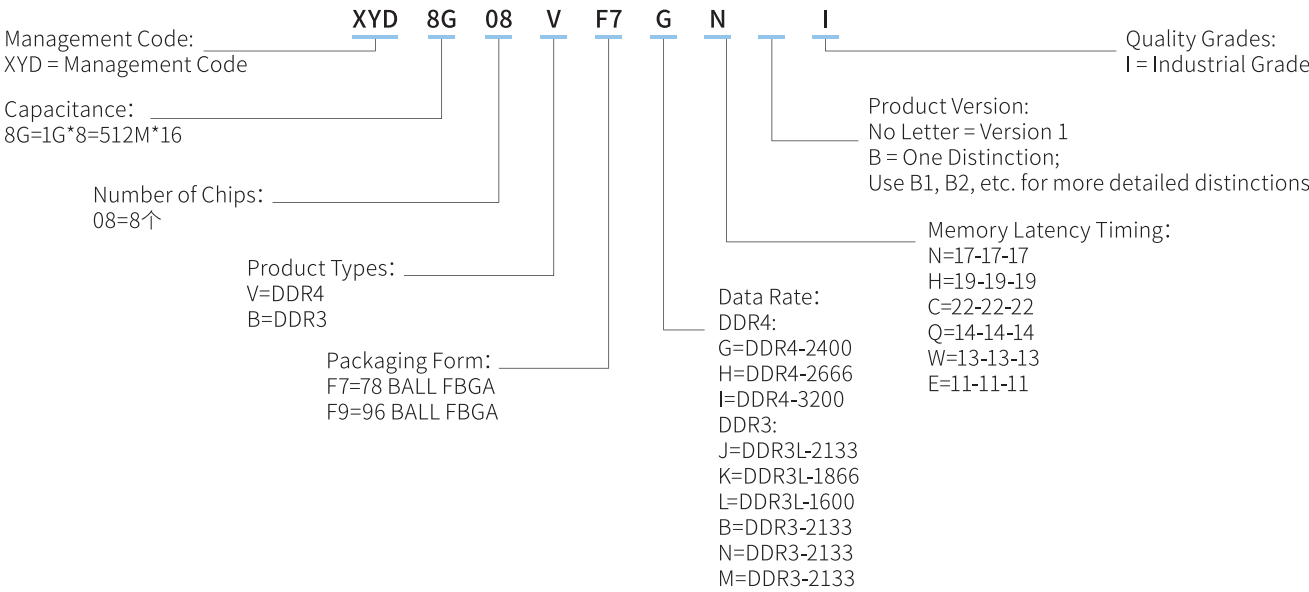


DDR3 and DDR4 represent key generations of Synchronous Dynamic Random-Access Memory (SDRAM) technology. As the previous mainstream memory standard, DDR3 delivers bandwidth performance that meets the requirements of conventional applications. DDR4, as the successor to DDR3, offers significant improvements in both energy efficiency and performance. Leveraging an optimized signal transmission architecture, it provides approximately double the bandwidth of its predecessor. With high-speed data processing capabilities and enhanced stability, DDR4 has become the standard configuration for new-generation servers, high-performance computing platforms, and mainstream end devices, fully supporting emerging applications such as cloud computing and artificial intelligence.

Product Features

- DDR3: Moderate frequency, excellent compatibility
- DDR4: Higher bandwidth, lower power consumption, superior performance

Selection Example



Specifications (DDR4)

Specifications	Product Part Number	Data Rate (Mb/s)	Memory Timings	Packaging
512Mx8	XYD4G08V-F7GNI	DDR4-2400	17-17-17	78 Ball FBGA
512Mx8	XYD4G08V-F7HPI	DDR4-2666	19-19-19	78 Ball FBGA
512Mx8	XYD4G08V-F7JSI	DDR4-3200	22-22-22	78 Ball FBGA
256Mx16	XYD4G16V-F9GNI	DDR4-2400	17-17-17	96 Ball FBGA
256Mx16	XYD4G16V-F9HPI	DDR4-2666	19-19-19	96 Ball FBGA
256Mx16	XYD4G16V-F9JSI	DDR4-3200	22-22-22	96 Ball FBGA
1Gx8	XYD8G08V-F7GNI	DDR4-2400	17-17-17	78 Ball FBGA
1Gx8	XYD8G08V-F7HPI	DDR4-2666	19-19-19	78 Ball FBGA
1Gx8	XYD8G08V-F7IRI	DDR4-2933	21-21-21	78 Ball FBGA
1Gx8	XYD8G08V-F7JSI	DDR4-3200	22-22-22	78 Ball FBGA
512Mx16	XYD8G16V-F9GNI	DDR4-2400	17-17-17	96 Ball FBGA
512Mx16	XYD8G16V-F9HPI	DDR4-2666	19-19-19	96 Ball FBGA
512Mx16	XYD8G16V-F9IRI	DDR4-2933	21-21-21	96 Ball FBGA
512Mx16	XYD8G16V-F9JSI	DDR4-3200	22-22-22	96 Ball FBGA

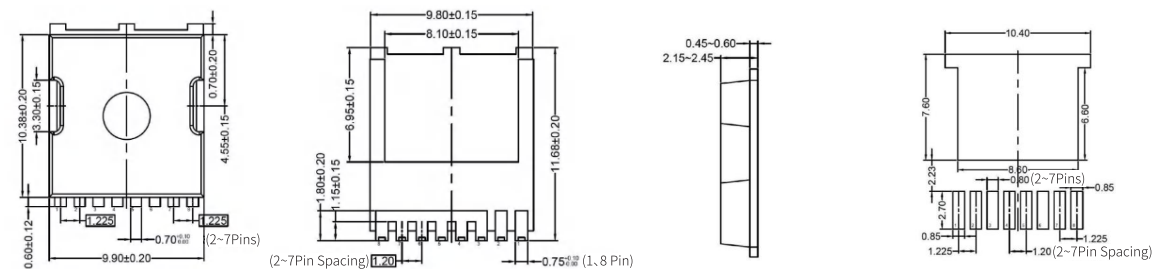
Specifications (DDR3)

Specification	Product Model	Rate			Packaging
		Clock(MHz)	Data Rate(Mb/s)	Memory Latency Timing	
512Mx8	XYD4G08B-F7JQI	1066	DDR3L-2133	14-14-14	78 Ball FBGA
512Mx8	XYD4G08B-F7KWI	933	DDR3L-1866	13-13-13	78 Ball FBGA
512Mx8	XYD4G08B-F7LEI	800	DDR3L-1600	11-11-11	78 Ball FBGA
512Mx8	XYD4G08B-F7BQI	1066	DDR3-2133	14-14-14	78 Ball FBGA
512Mx8	XYD4G08B-F7NWI	933	DDR3-1866	13-13-13	78 Ball FBGA
512Mx8	XYD4G08B-F7MEI	800	DDR3-1600	11-11-11	78 Ball FBGA
256Mx16	XYD4G16B-F9JQI	1066	DDR3L-2133	14-14-14	96 Ball FBGA
256Mx16	XYD4G16B-F9KWI	933	DDR3L-1866	13-13-13	96 Ball FBGA
256Mx16	XYD4G16B-F9LEI	800	DDR3L-1600	11-11-11	96 Ball FBGA
256Mx16	XYD4G16B-F9BQI	1066	DDR3-2133	14-14-14	96 Ball FBGA
256Mx16	XYD4G16B-F9NWI	933	DDR3-1866	13-13-13	96 Ball FBGA
256Mx16	XYD4G16B-F9MEI	800	DDR3-1600	11-11-11	96 Ball FBGA
512Mx16	XYD8G16B-F9KWI	933	DDR3-1866	13-13-13	96 Ball FBGA
512Mx16	XYD8G16B-F9LEI	800	DDR3-1600	11-11-11	96 Ball FBGA
512Mx16	XYD8G16B-F9NWI	933	DDR3L-1866	13-13-13	96 Ball FBGA
512Mx16	XYD8G16B-F9MEI	800	DDR3L-1600	11-11-11	96 Ball FBGA

PACKAGING
FORM 03

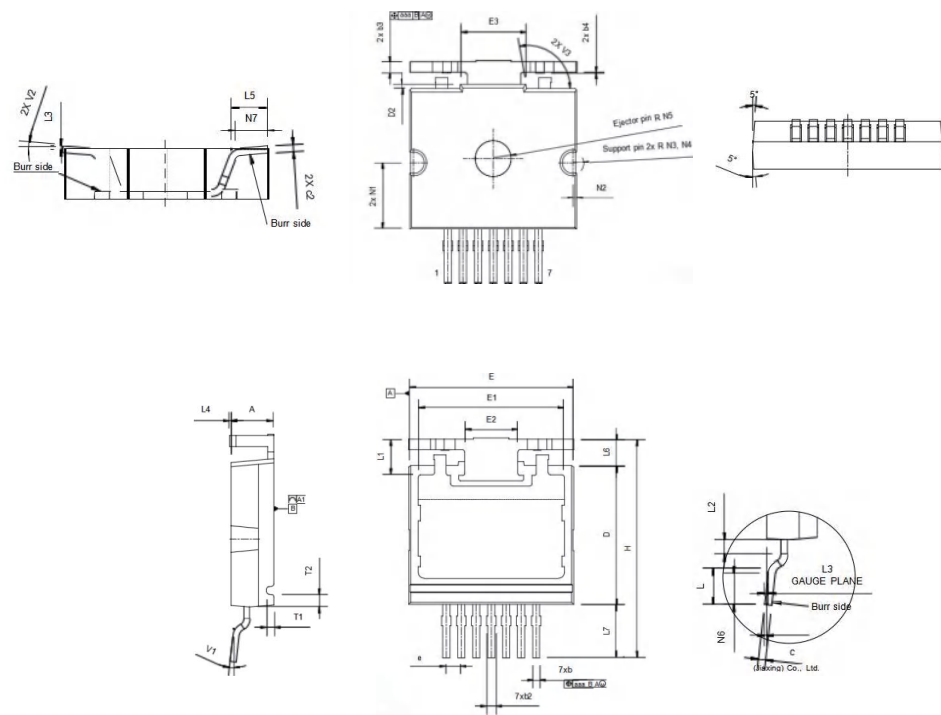
MCT

TOLL-2L



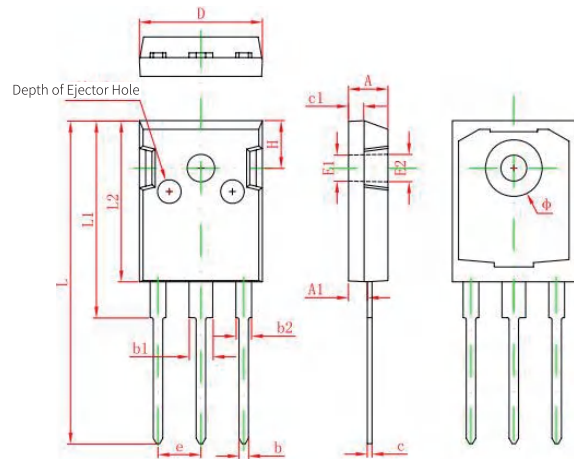
SiC MOSFET

T2PAK-7L



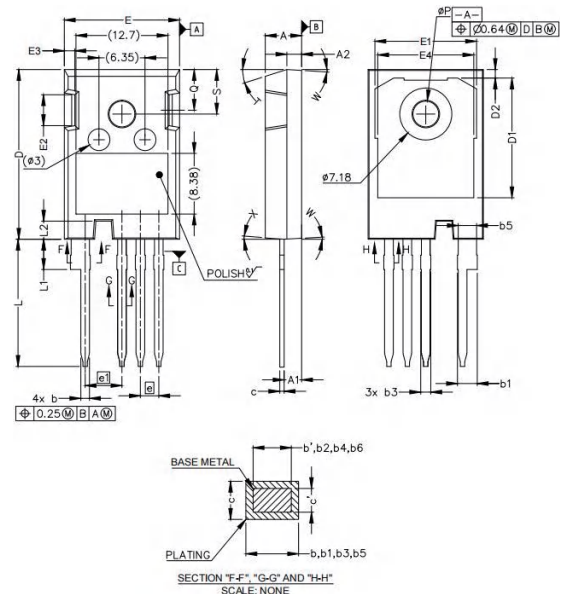
SYMBOL	Common DIMENSIONS MILLIMETER		
	MIN.	NOM.	MAX.
A	3.40	3.50	3.60
A1	0.05		
b	0.50	0.60	0.70
b2	0.70	0.80	0.90
b3	0.80	0.90	0.98
b4	Ref only, 0.05 mm		
c	0.40	0.50	0.60
c2	0.40	0.50	0.60
D	11.70	11.80	11.90
D1	7.78	7.88	7.98
D2	0.24	0.34	0.44
E	13.90	14.00	14.10
E1	12.30	12.40	12.50
E2	4.45	4.50	4.55
E3	5.45	5.50	5.55
e	1.27		
H	18.00	18.58	19.00
L	2.42	2.62	2.62
L1	3.04		
L2	0.90	1.00	1.10
L3	0.26		
L4	0.075	0.125	0.175
L5	2.38	2.48	2.58
L6	2.14	2.24	2.34
L7	4.44	4.54	4.64
N1	5.46	5.56	5.66
N2	0.25	0.30	0.35
N3	0.80	0.90	1.00
N4	1.00	1.10	1.20
N5	1.40	1.50	1.60
N6	2.185	2.285	2.385
N7	2.10	2.20	2.30
T1			
T2			
T3			
V1			
V2			
V3			
aaa	0.1		

TO-247-3L



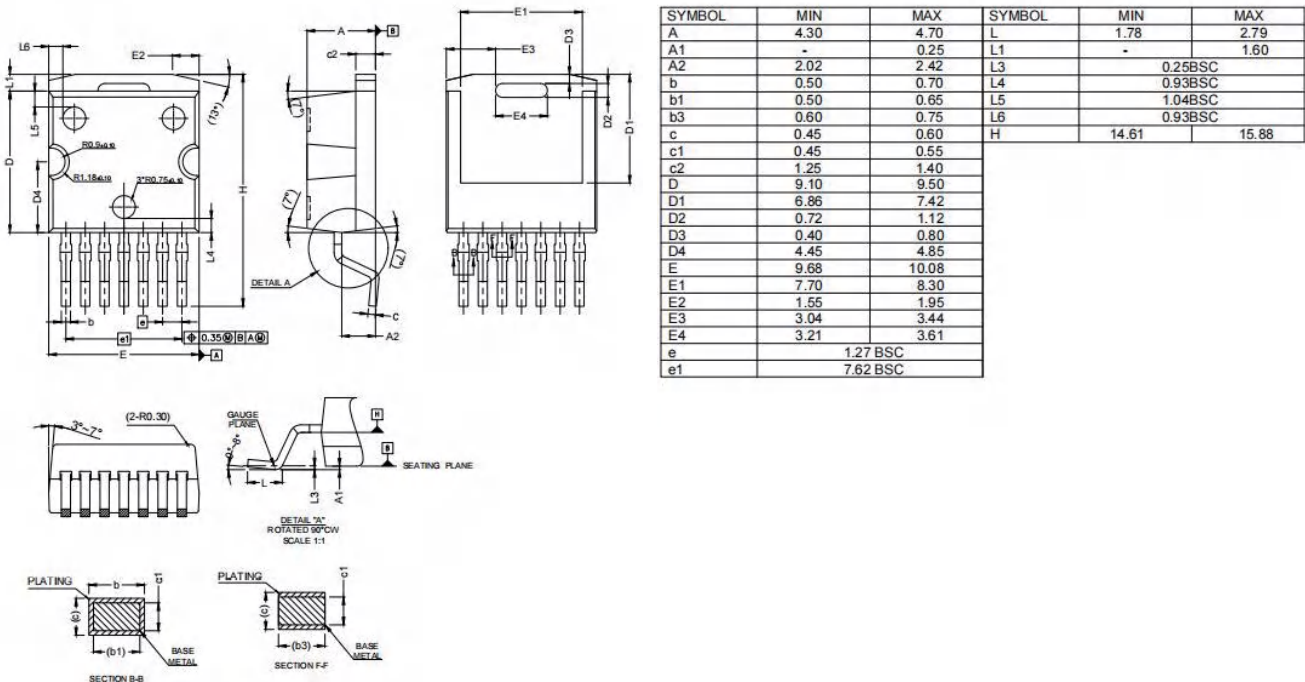
Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	4.850	5.150	0.191	0.200
A1	2.200	2.600	0.087	0.102
b	1.000	1.400	0.039	0.055
b1	2.800	3.200	0.110	0.126
b2	1.800	2.200	0.071	0.087
c	0.500	0.700	0.020	0.028
c1	1.900	2.100	0.075	0.083
D	15.450	15.750	0.608	0.620
E1	3.500 REF		0.138 REF	
E2	3.600 REF		0.142 REF	
L	40.900	41.300	1.610	1.626
L1	24.800	25.100	0.976	0.988
L2	20.300	20.600	0.799	0.811
Φ	7.100	7.300	0.280	0.287
e	5.450 TYP		0.215 TYP	
H	5.980 REF		0.235 REF	
h	0.000	0.300	0.000	0.012

TO-247-4L

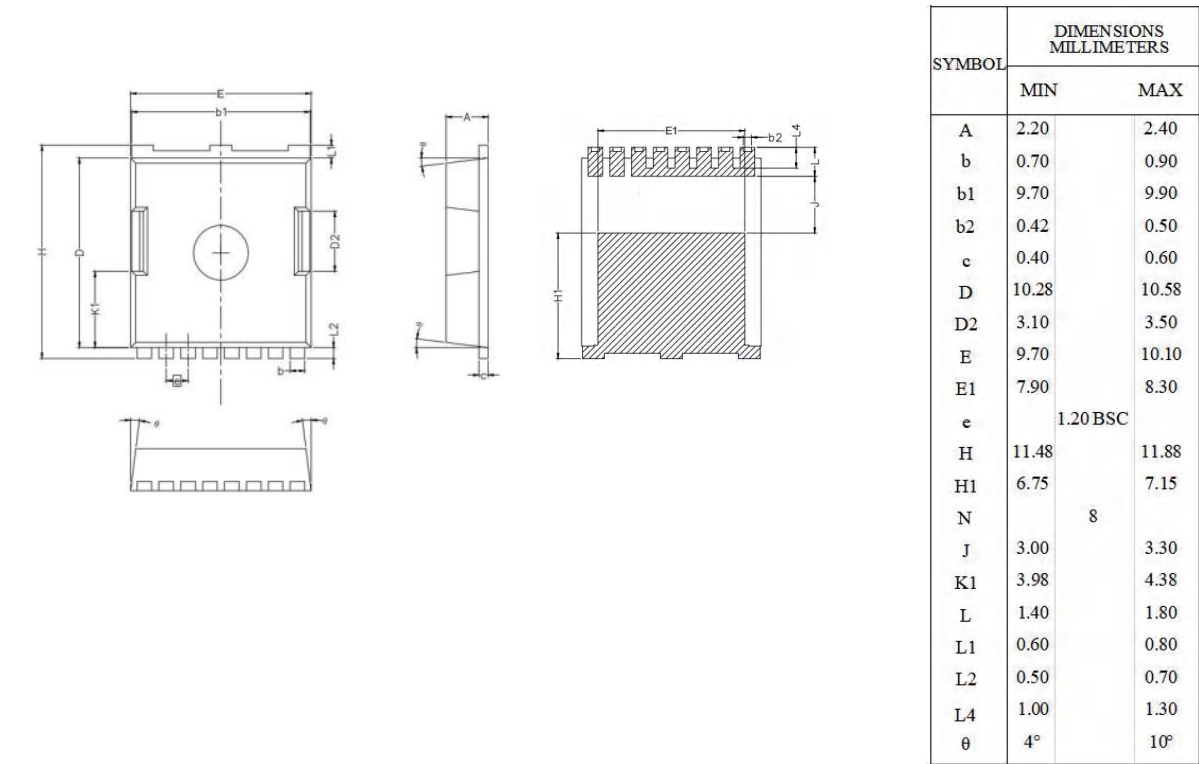


SYMBOL	MILLIMETERS	
	MIN	MAX
A	4.83	5.21
A1	2.29	2.54
A2	1.91	2.16
b'	1.07	1.28
b	1.07	1.33
b1	2.39	2.94
b2	2.39	2.84
b3	1.07	1.60
b4	1.07	1.50
b5	2.39	2.69
b6	2.39	2.64
c'	0.55	0.65
c	0.55	0.68
D	23.30	23.60
D1	16.25	17.65
D2	0.95	1.25
E	15.75	16.13
E1	13.10	14.15
E2	3.68	5.10
E3	1.00	1.90
E4	12.38	13.43
e	2.54 BSC	
e1	5.08 BSC	
N	4	
L	17.31	17.82
L1	3.97	4.37
L2	2.35	2.65
øP	3.51	3.65
Q	5.49	6.00
S	6.04	6.30
T	17.5° REF.	
W	3.5° REF.	
X	4° REF.	

TO-263-7L

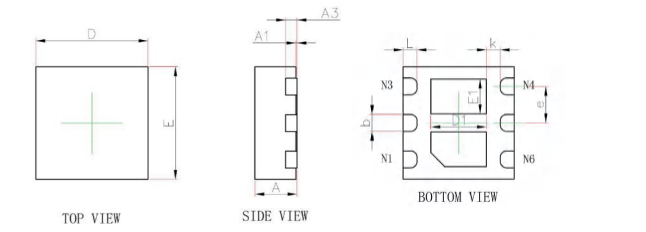


TOLL-2L



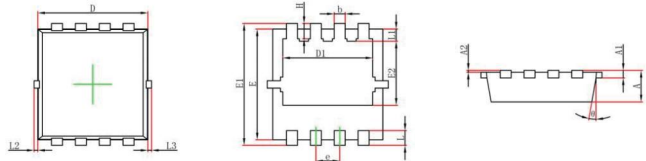
MOSFET

DFN2*2-6L



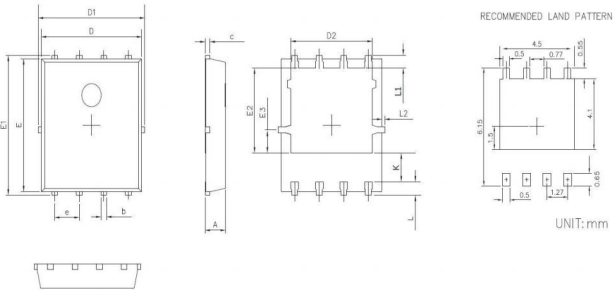
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0	0.050	0	0.002
A3	2.03REF		0.008REF	
D	1.900	2.100	0.075	0.083
E	1.900	2.100	0.075	0.083
D1	0.900	1.100	0.035	0.043
E1	0.520	0.720	0.020	0.028
k	0.200MIN		0.008MIN	
b	0.250	0.350	0.010	0.014
e	0.65BSC		0.026TYP	
L	0.174	0.326	0.007	0.013

PDFN3.3*3.3-8L



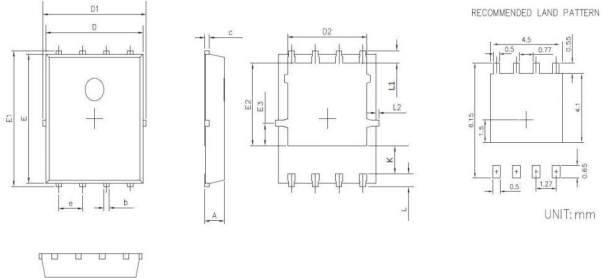
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.152REF		0.006REF	
A2	0.000	0.050	0.000	0.002
D	2.900	3.200	0.114	0.126
D1	2.300	2.600	0.091	0.102
E	2.900	3.200	0.114	0.126
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0.000	0.100	0.000	0.004
L3	0.000	0.100	0.000	0.004
H	0.315	0.515	0.012	0.020
theta	0°	12°	0°	12°

PDFN5*6 Clip-8L



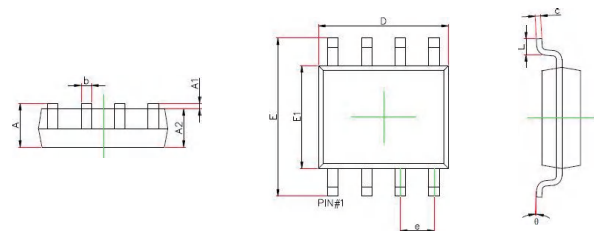
Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.10	0.035	0.043
b	0.25	0.50	0.010	0.020
c	0.10	0.30	0.004	0.012
D	4.80	5.30	0.189	0.209
D1	4.90	5.50	0.193	0.217
D2	3.92	4.20	0.154	0.165
E	5.65	5.85	0.222	0.230
E1	5.90	6.20	0.232	0.244
E2	3.33	3.78	0.131	0.149
E3	0.80	1.00	0.031	0.039
e	1.27		0.050	
L	0.40	0.70	0.016	0.028
L1	0.65		0.026	
L2	0.00	0.15	0.000	0.006
K	1.00	1.50	0.039	0.059

PDFN5*6-8L



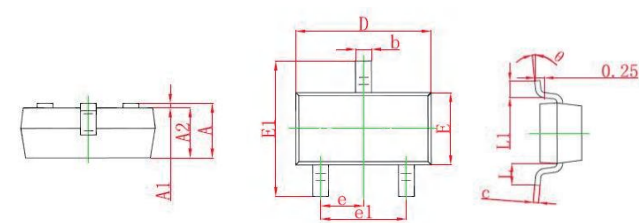
Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.10	0.035	0.043
b	0.25	0.50	0.010	0.020
c	0.10	0.30	0.004	0.012
D	4.80	5.30	0.189	0.209
D1	4.90	5.50	0.193	0.217
D2	3.92	4.20	0.154	0.165
E	5.65	5.85	0.222	0.230
E1	5.90	6.20	0.232	0.244
E2	3.33	3.78	0.131	0.149
E3	0.80	1.00	0.031	0.039
e	1.27		0.050	
L	0.40	0.70	0.016	0.028
L1	0.65		0.026	
L2	0.00	0.15	0.000	0.006
K	1.00	1.50	0.039	0.059

SOP-8L



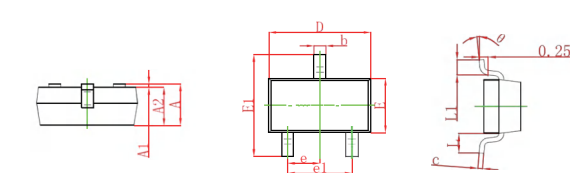
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.156	0.250	0.006	0.010
D	4.700	5.100	0.185	0.201
e	1.270(BSC)		0.050(BSC)	
E	5.800	6.200	0.228	0.244
E1	3.700	4.100	0.146	0.161
L	0.400	1.270	0.016	0.05
θ	0°	8°	0°	8°

SOT-23



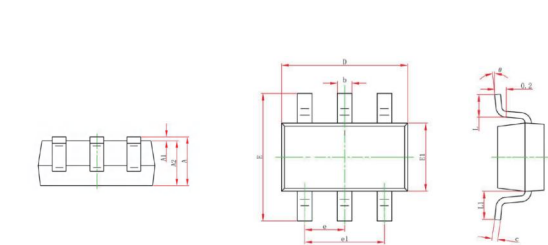
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23-3L



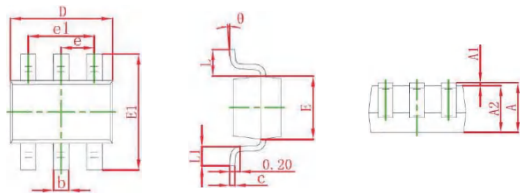
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23-6L



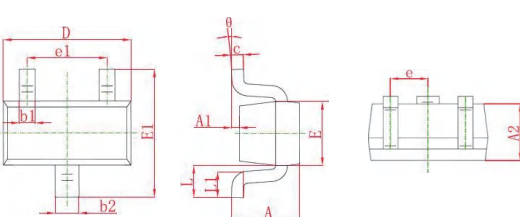
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0	0.150	0.000	0.006
A2	1.050	1.250	0.041	0.049
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	2.650	2.950	0.104	0.116
E1	1.500	1.700	0.059	0.067
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
L1	0.600REF		0.024REF	
θ	0°	8°	0°	8°

SOT-363



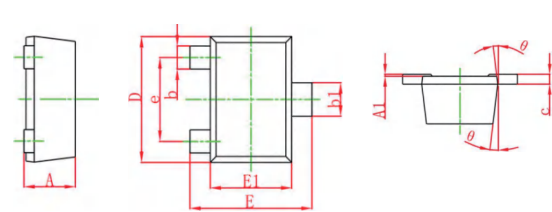
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.100	0.150	0.004	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.400	0.085	0.094
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

SOT-523



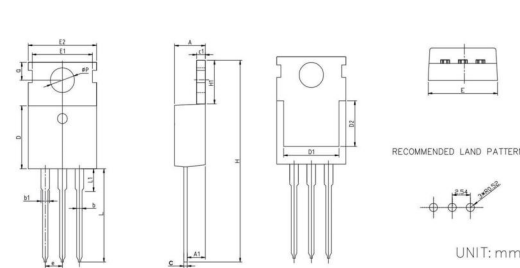
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP		0.020 TYP	
e1	0.900	1.100	0.035	0.043
L	0.400 REF		0.016 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

SOT-723



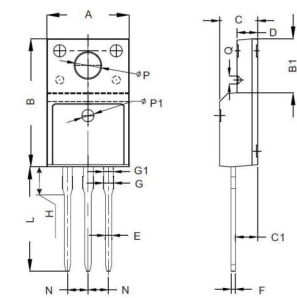
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.400	0.500	0.016	0.020
A1	0.000	0.050	0.000	0.002
b	0.150	0.270	0.006	0.011
b1	0.200	0.370	0.008	0.015
c	0.060	0.160	0.002	0.006
D	1.100	1.300	0.043	0.051
E	1.100	1.300	0.043	0.051
E1	0.700	0.900	0.028	0.035
e	0.8TYP		0.031TYP	
θ	8°REF		8°REF	

TO-220-3L



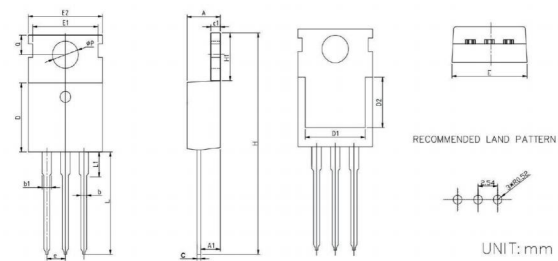
Symbol	Dimensions In Millimeters		
	Min.	Typical Value	Max.
A	4.40	4.60	4.80
A1	2.25	2.40	2.55
b	0.72	0.82	0.92
b1	1.12	1.27	1.42
c	0.40	0.50	0.60
e1	1.20	1.30	1.40
D	8.80	9.10	9.40
D1	7.75	7.95	8.15
D2	6.55	6.75	6.95
e	2.54BSC		
E	9.65	10.00	10.35
E1	8.70		
E2	9.70	10.00	10.30
H	28.70	29.20	29.70
H1	6.25	6.50	6.85
L	13.20	13.50	13.80
L1	2.80	3.10	3.40
Q	2.60	2.80	3.00
ΦP	3.45	3.60	3.75

TO-220F-3L



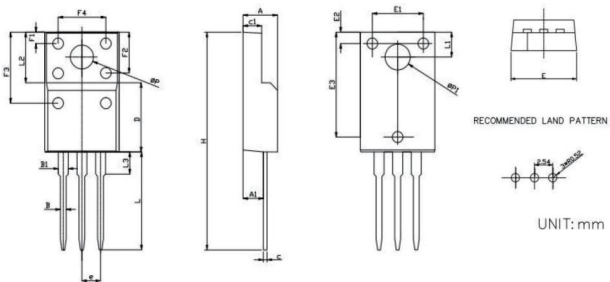
Symbol	Millimeters		Symbol	Millimeters	
	Min	Max		Min	Max
A	9.60	10.4	G	1.12	1.42
B	15.4	16.2	G1	1.10	1.40
B1	6.30	6.90	H	3.40	3.80
C	4.30	4.90	L	12.0	14.0
C1	2.20	3.00	N	2.34	2.74
D	2.40	2.90	ΦP	3.00	3.30
E	0.60	1.00	ΦP1	1.35	1.75
F	0.30	0.60	Q	0.80	1.20

TO-220CB-3L



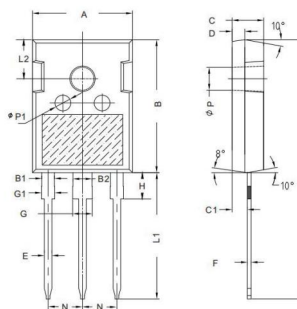
SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.40	4.80	0.173	0.189
A1	2.25	2.55	0.089	0.100
b	0.72	0.92	0.028	0.036
b1	1.12	1.42	0.044	0.056
c	0.40	0.60	0.016	0.024
c1	1.20	1.40	0.047	0.055
D	8.80	9.40	0.346	0.370
D1	7.75	8.15	0.305	0.321
D2	6.55	6.95	0.258	0.274
e	2.54		0.100	
E	9.65	10.35	0.380	0.407
E1	8.70		0.343	
E2	9.70	10.30	0.382	0.406
H	28.70	29.70	1.130	1.169
H1	6.25	6.85	0.246	0.270
L	13.20	13.80	0.520	0.543
L1	2.80	3.40	0.110	0.134
Q	2.60	3.00	0.102	0.118
ΦP	3.45	3.75	0.136	0.148

TO-220MF-3L



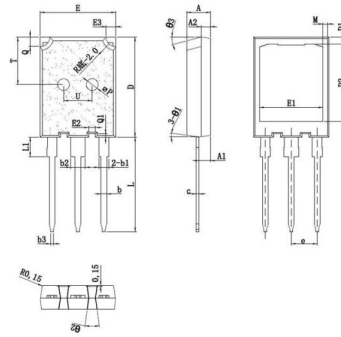
SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.50	4.90	0.177	0.193
A1	2.63	2.89	0.104	0.114
B	0.75	0.90	0.030	0.035
B1	1.15	1.55	0.045	0.061
C	0.40	0.60	0.016	0.024
C1	2.34	2.74	0.092	0.108
D	8.87	9.47	0.349	0.373
e	2.54		0.100	
E	9.86	10.46	0.388	0.412
E1	6.86	7.06	0.270	0.278
E2	1.40	1.60	0.055	
E3	13.80	14.00	0.543	0.551
F1	1.40	1.60	0.055	
F2	5.15	5.65	0.203	0.222
F3	9.10	9.70	0.358	0.382
F4	6.70	7.30	0.264	0.287
H	28.50	29.50	1.122	1.161
L	12.58	13.38	0.495	0.527
L1	3.15	3.45	0.124	0.136
L2	6.70		0.264	
L3	2.63	3.23	0.104	0.127
ΦP	2.90	3.48	0.114	0.137
ΦP1	3.15	3.75	0.124	0.148

TO-247-3L



SYMBOL	MILLIMETERS		SYMBOL	MILLIMETERS	
	MIN	MAX		MIN	MAX
A	15.6	16	G	2.90	3.30
B	19.9	21.2	G1	1.90	2.30
B1	1.80	2.20	H	3.90	4.30
B2	2.80	3.20	L	46.5	41.4
C	4.80	5.20	L1	19.7	20.2
C1	2.20	2.60	L2	6.04	6.30
D	1.90	2.10	N	5.30	5.68
E	1.00	1.40	ΦP	3.40	3.80
F	0.50	0.70	ΦP1	2.20	2.50

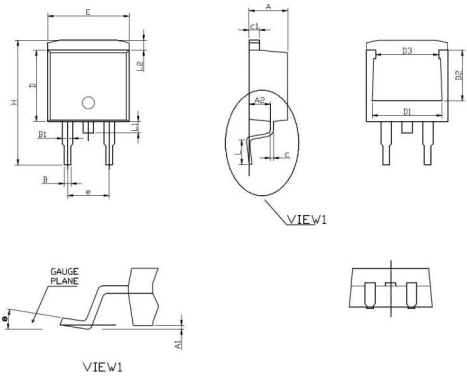
TO-247-PLUS



SYMBOL	mm			SYMBOL	mm		
	MIN	NOM	MAX		MIN	NOM	MAX
*A	4.90	5.00	5.10	E3	1.80	2.00	2.20
*A1	2.30	2.40	2.50	*e	5.40	5.44	5.48
A2	1.90	2.00	2.10	*L	19.80	19.95	20.10
b	1.15	1.20	1.25	*L1	-	-	4.30
*b1	1.95	2.10	2.25	M	0.50	0.70	0.90
*b2	2.95	3.10	3.25	Φp	2.30	2.50	2.70
b3	0.45	0.60	0.75	Q	1.80	2.00	2.20
*C	0.55	0.60	0.68	Q1	0.50	0.68	0.80
*D	20.90	21.00	21.10	T	9.80	10.00	10.20
D1	1.00	1.20	1.40	U	5.80	6.00	6.20
D2	16.05	16.35	16.65	Ø1	5"	7"	9"
E	15.70	15.80	15.90	Ø2	13"	16"	19"
E1	13.10	13.30	13.50	Ø3	13"	15"	17"
E2	1.25	1.45	1.65				

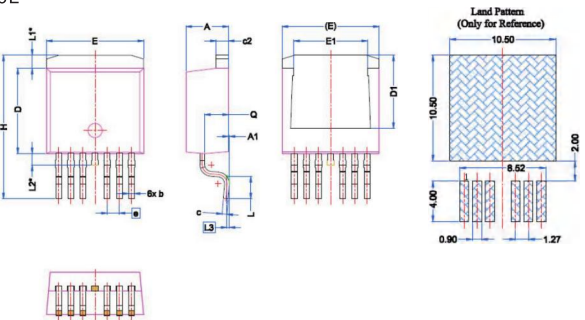
*Key Control Dimensions

TO-263-2L



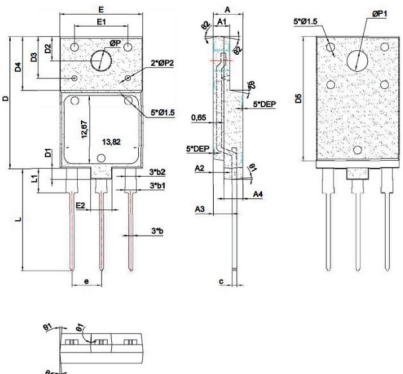
SYMBOL	mm		
	MIN	NOM	MAX
A	4.50	4.70	4.90
A1	0.05	0.15	0.30
A2	2.45	2.60	2.70
B	0.72	0.82	0.92
B1	1.12	1.27	1.42
c	0.28	0.38	0.48
c1	1.17	1.27	1.37
D	8.46	8.66	8.86
D1	7.90	8.10	8.40
D2	5.50	6.70	5.90
D3	7.10	7.30	7.50
E	9.85	10.15	10.45
e	5.08BCS		
H	14.75	15.15	15.55
I	2.30	2.55	2.80
L1	1.20	1.40	1.60
L2	1.01	1.23	1.50
Ø	0"	7"	8"

TO-263-6L



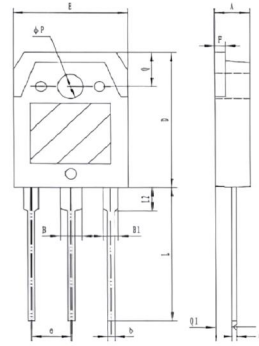
SYMBOL	DIMENSIONS		
	MIN	NOM	MAX
A	4.24	4.44	4.64
A1	0.00	0.10	0.25
b	0.50	0.60	0.70
c	0.40	0.50	0.60
c2	1.15	1.27	1.40
D	8.82	8.92	9.02
D1	6.86	7.65	-
E	9.96	10.16	10.36
E1	6.89	7.77	7.89
e	1.27MSC		
H	14.61	15.00	15.88

TO-3PF-3L



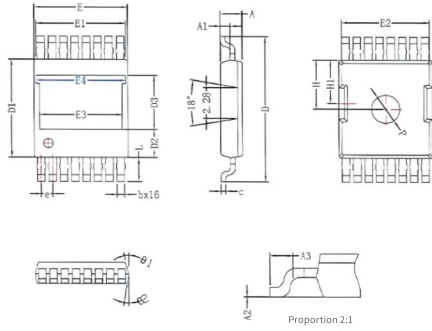
SYMBOL	mm			SYMBOL	mm		
	MIN	NOM	MAX		MIN	NOM	MAX
*A	5.30	5.50	5.70	D5	22.75	23.00	23.25
A1	2.85	3.05	3.25	*E	15.15	15.35	15.55
A2	1.85	2.00	2.15	E	9.75	10.00	10.25
*A3	3.30	3.45	3.60	E1	3.85	4.00	4.15
A4	3.35	3.50	3.65	E2	3.85	4.00	4.15
*b	0.68	0.75	0.83	*e	5.40	5.45	5.50
*b1	2.06	2.16	2.26	*L	18.70	18.90	19.10
*b2	1.92	2.00	2.08	*L1	4.40	4.55	4.70
*c	0.82	0.90	0.98	*ΦP	3.57	3.67	3.77
*D	24.20	24.40	24.60	*ΦP1	3.80	3.90	4.00
D1	1.85	2.05	2.25	ΦP2	0.90	1.00	1.10
D2	3.35	4.50	4.65	Ø1	2"	5"	8"
D3	7.55	7.70	7.85	Ø2	7"	10"	13"
D4	9.76	9.96	10.16	*DEP	0.00	-	0.15

TO-3PN-3L



SYMBOL	MILLIMETER	
	MIN	MAX
A	4.60	5.00
B	2.90	3.20
B1	1.90	2.20
b	0.90	1.10
c	0.50	0.70
D	19.70	20.70
E	15.40	15.80
e	5.45type	
F	1.40	1.60
L	19.00	20.00
L2	3.30	3.70
Q	3.50	3.80
Q1	2.30	2.50
P	3.10	3.50

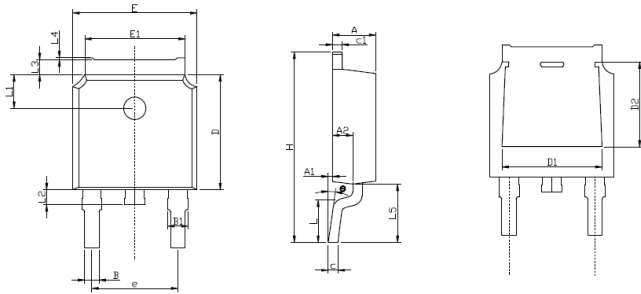
TOLT



*Key Control Dimensions

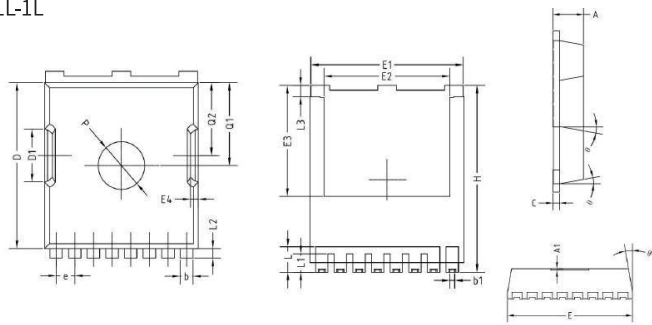
SYMBOL	mm			SYMBOL	mm		
	MIN	NOM	MAX		MIN	NOM	MAX
*A	2.25	2.30	2.35	E1	9.60REF		
*A1	1.00	1.04	1.08	E2	9.25REF		
*A2	0.01	0.08	0.16	E3	8.25REF		
A3		1.50REF		E4	8.70REF		
*b	0.68	0.70	0.74	*c	1.18	1.20	1.22
*C	0.45	0.50	0.55	*D	5.00	5.20	5.40
*D	14.80	15.00	15.20	H1	4.40	4.60	4.80
*D1	10.80	10.10	10.30	*L	2.40	2.45	2.50
D2	2.60	2.80	3.00	*P	2.80	3.00	3.20
D3		5.77REF		0.1	7*	-	9*
E	9.70	9.90	10.10	0.2	7	-	9*

TO-252-2L



	MIN	NOM	MAX
A	2.15	2.30	2.45
A1	0.05	0.10	0.20
A2	0.91	1.07	1.22
B	0.66	0.76	0.86
B1	0.93	1.08	1.23
C	0.40	0.50	0.60
C1	0.40	0.50	0.60
D	5.95	6.10	6.25
D1		4.8REF	
D2		3.8REF	
E	6.45	6.60	6.75
E1	5.12	5.32	5.52
L		1.65	
L1	5.18	1.78	1.98
L2	0.60	0.80	1.00
L3	0.70	0.85	1.00
L4	0.00	0.05	0.20
L5	2.80	3.10	3.40
H	9.80	10.10	10.40
θ	0°		8°
e		4.572REF	

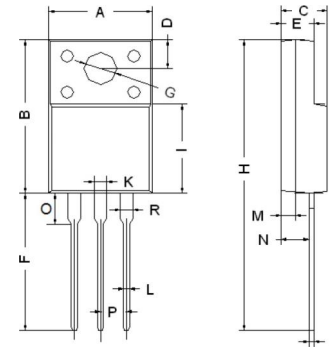
TOLL-1L



SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.20	2.40	0.087	0.094
A1	0.05	0.20	0.002	0.008
b	0.65	0.85	0.026	0.033
b1	0.30	0.50	0.012	0.020
C	0.35	0.65	0.014	0.026
D	10.35	10.70	0.407	0.421
D1	3.15	3.45	0.124	0.136
E	9.80	10.00	0.386	0.394
E1	9.65	9.95	0.380	0.392
E2	7.90	8.30	0.311	0.327
E3	6.80	7.20	0.268	0.283
E4	0.30	0.75	0.012	0.030
e	1.15	1.25	0.045	0.049
L	1.35	1.85	0.053	0.073
L1	0.95	1.35	0.037	0.053
L2	0.40	0.80	0.016	0.031
L3	0.60	0.85	0.024	0.033
Ø	7"	7"	12"	12"
P	2.90	3.10	0.114	0.122
Q	4.50	4.70	0.177	0.185
Q1	5.10	5.30	0.201	0.209
H	11.55	11.95	0.455	0.470

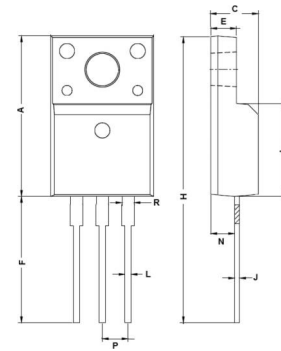
IGBT

TO-220-3L



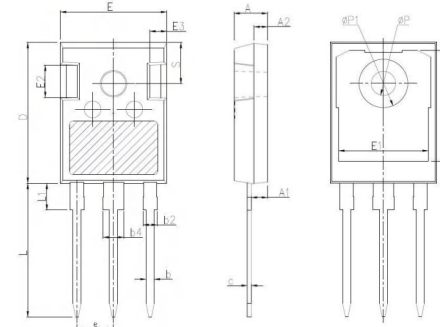
TO-220		
Dim	Min	Max
A	9.90	10.30
B	14.80	15.20
C	4.30	4.70
D	2.50	2.90
E	2.80	3.30
F	13.00	13.60
G	3.10	3.30
H	28.00	28.60
I	7.90	8.90
J	0.40	0.60
L	0.70	0.90
M	1.30	1.50
N	2.60	2.80
O	2.60	3.10
P	2.45	2.65
K/R	1.10	1.30
All Dimensions in mm		

TO-220F-3L



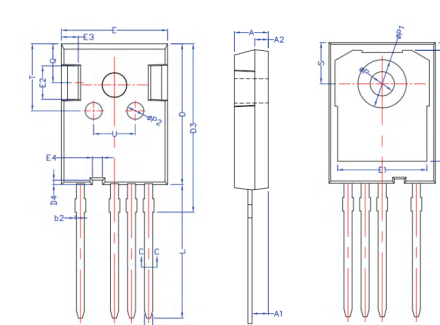
TO-220F		
Dimension	Min.	Max.
A	15.60	16.00
C	4.50	4.90
E	2.44	2.64
F	12.20	12.60
H	27.80	28.60
I	8.70	9.70
J	0.40	0.60
L	0.70	0.90
N	2.50	2.70
P	2.45	2.65
R	1.10	1.30

TO-247-3L



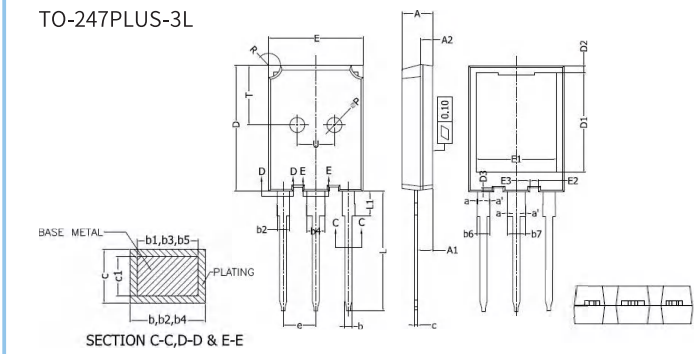
SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.59
A2	1.85	2.00	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
b4	2.91	3.01	3.21
c	0.51	0.61	0.75
D	20.80	21.00	21.30
D1	16.25	16.55	16.85
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.80	5.00	5.20
E3	2.30	2.50	2.70
e		5.44 BSC	
	19.82	19.92	20.22
L1	-	-	4.30
ΦP	3.40	3.60	3.80
ΦP1	-	-	7.30
S		6.15 BSC	

TO-247-4L



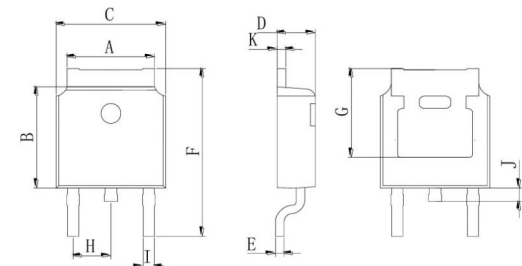
COMMON DIMENSIONS (UNITS OF MEASURE=MILLIMETER)				
SYMBOL	MIN	NOM	MAX	
A	4.90	5.00	5.10	
A1	2.31	2.41	2.51	
A2	1.80	2.00	2.10	
b	1.16	1.20	1.25	
b1	1.15	1.20	1.25	
c2	0.9	—	0.20	
c3	0.59	—	0.66	
C1	0.58	0.60	0.65	
D	20.90	21.00	21.10	
D1	16.25	16.55	16.85	
D2	1.12	1.25	1.38	
D3	24.92	25.12	25.27	
D4	0.55, 0.65	0.75	0.90	
E	15.70	15.80	15.90	
E1	13.10	13.20	13.30	
E2	4.90	5.00	5.10	
F3	2.40	2.50	2.60	
F4	1.40, 1.50	1.60	1.80	
G	2.44	2.50	2.60	
H1	4.98	5.08	5.18	
L	19.80	19.92	20.10	
P	3.50	3.60	3.70	
P1	—	—	2.40	
P2	2.40	2.50	2.60	
Q	5.60	—	6.00	
S	—	6.15BSC	—	
T	9.80	—	10.20	
U	6.00	—	6.40	

TO-247PLUS-3L



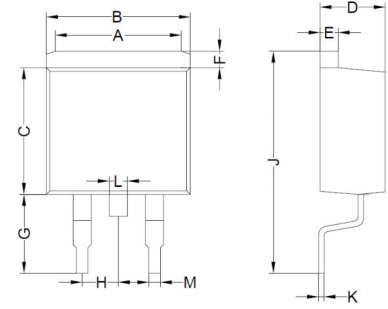
SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.90	5.00	5.10
A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
a	0.00	-	0.15
a'	0.00	-	0.15
b	1.16	-	1.26
b1	1.15	1.20	1.22
b2	1.96	-	2.06
b3	1.95	2.00	2.02
b4	2.96	-	3.06
b5	2.96	3.00	3.02
b6	-	-	2.25
b7	-	-	3.25
c	0.59	-	0.66
c1	0.59	0.60	0.66
D	20.90	21.00	21.10

TO-252-2L



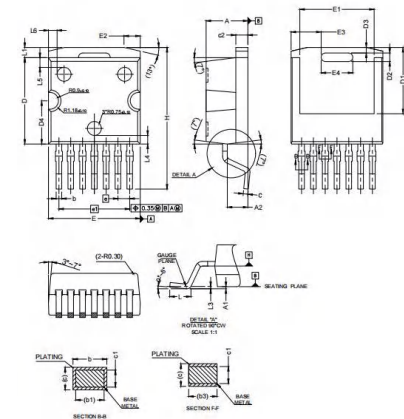
TO-252		
Dimension	Min.	Max.
A	5.05	5.65
B	5.80	6.40
C	6.25	6.85
D	2.20	2.40
E	0.40	0.60
F	9.71	10.31
G	5.05	5.65
H	2.10	2.50
I	0.70	0.90
J	0.50	0.70
K	0.40	0.60

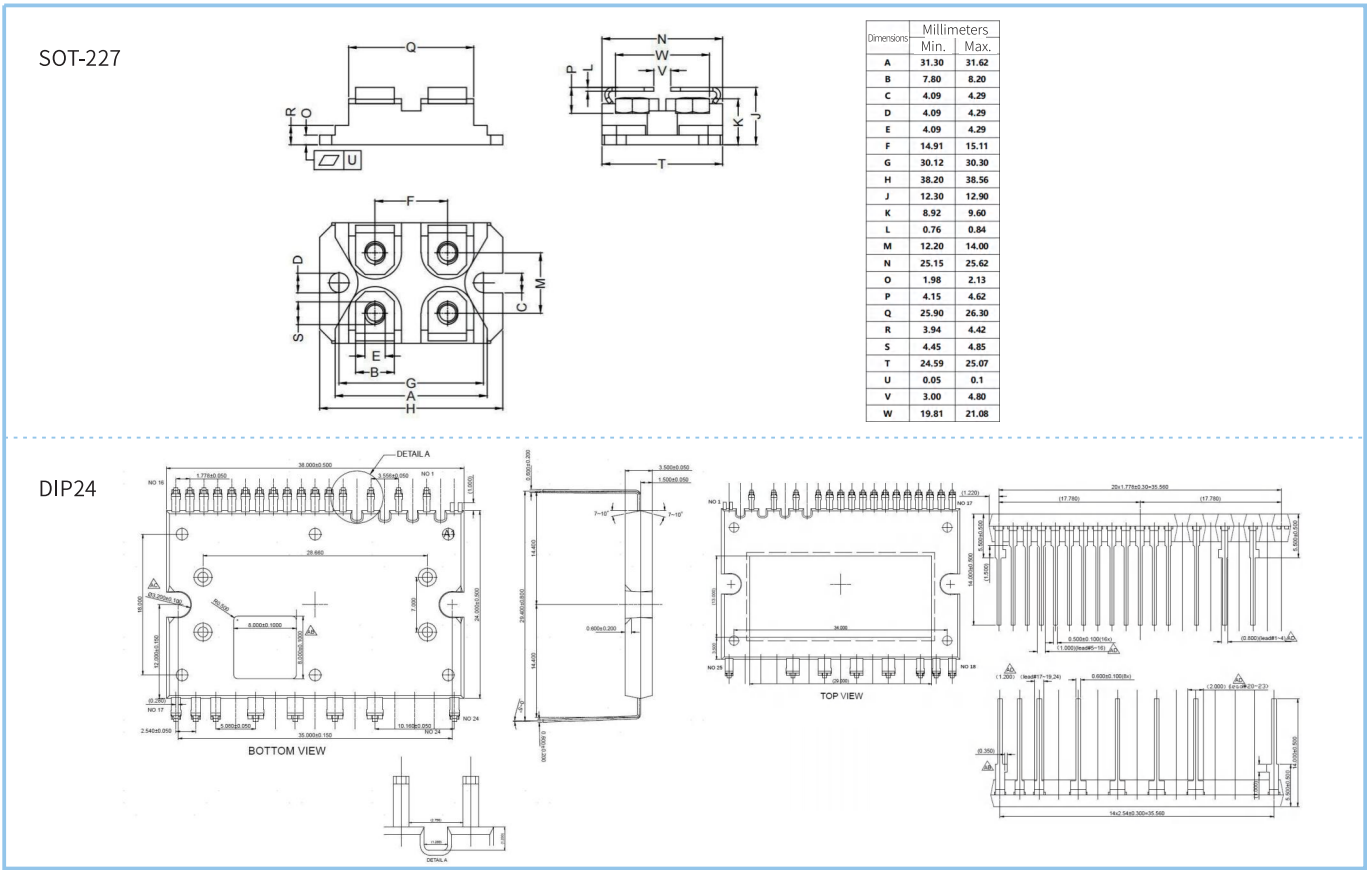
TO-263-2L



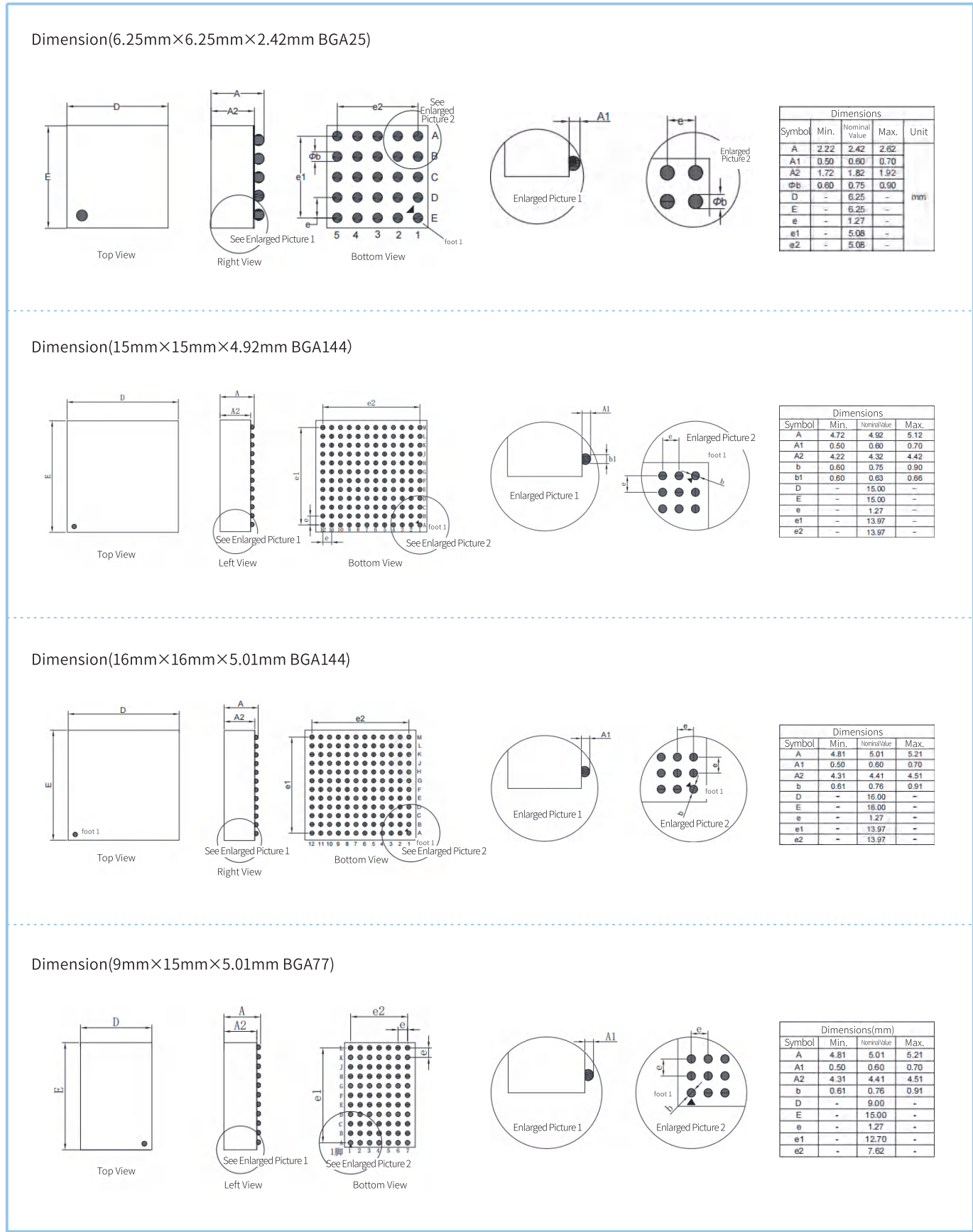
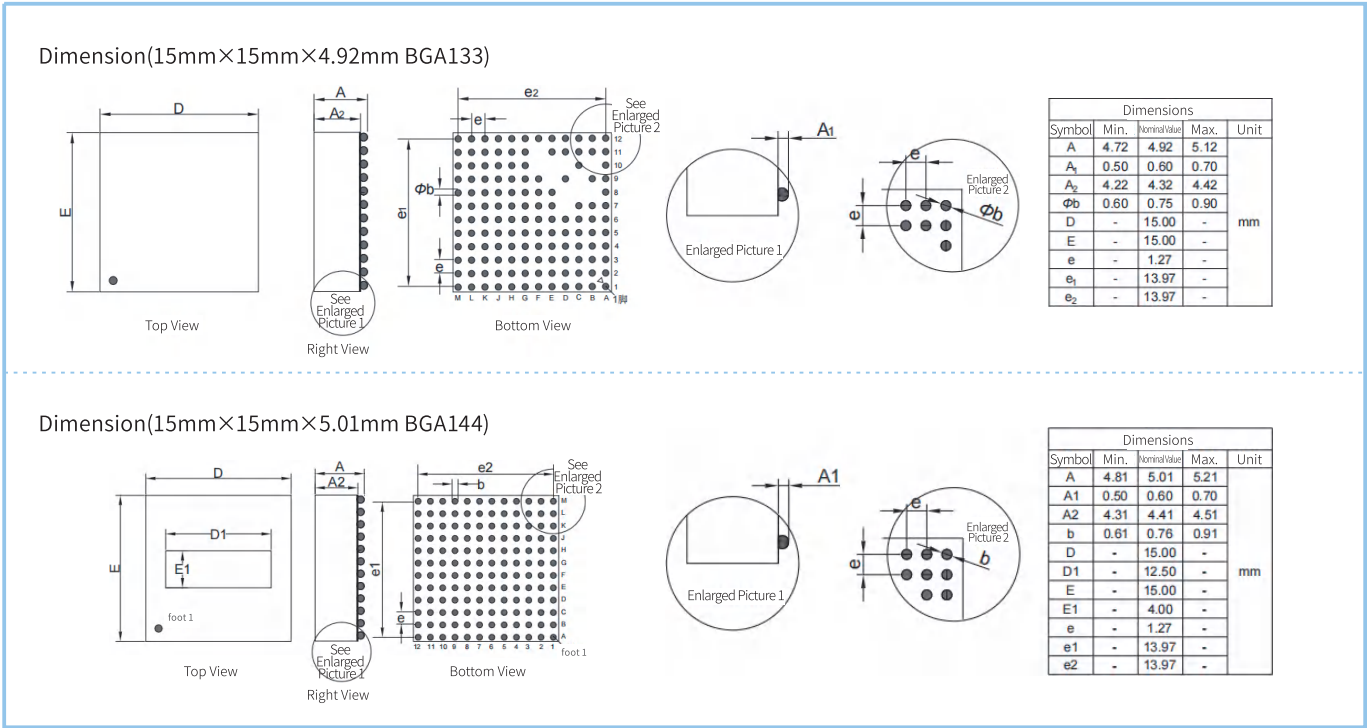
TO-263		
A	7.30	7.70
B	9.90	10.30
C	8.70	9.10
D	4.37	4.77
E	1.07	1.47
F	1.06	1.26
G	5.34	5.74
H	2.44	2.64
J	15.30	15.90
K	0.28	0.48
L	1.17	1.37
M	0.71	0.91

TO-263-7L

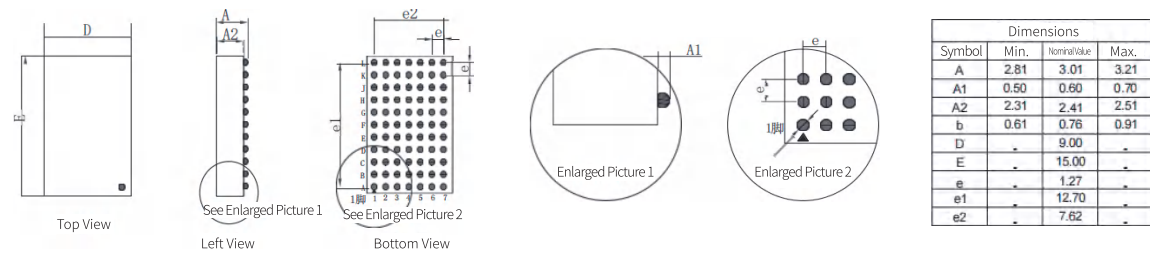




Micro Power Module (46 Series)

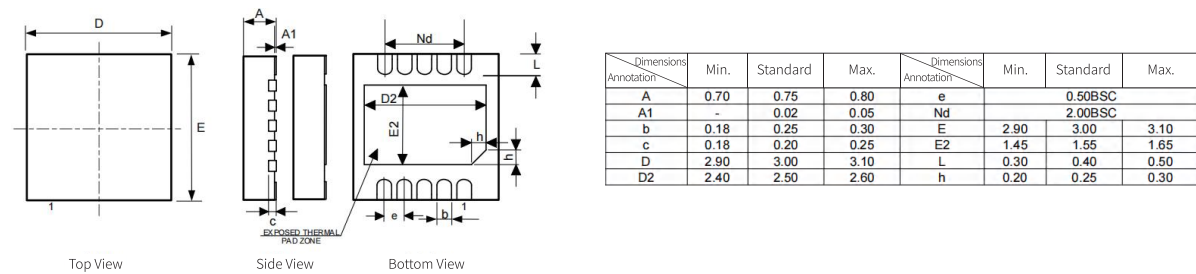


Dimension(9mm×15mm×3.01mm BGA77)

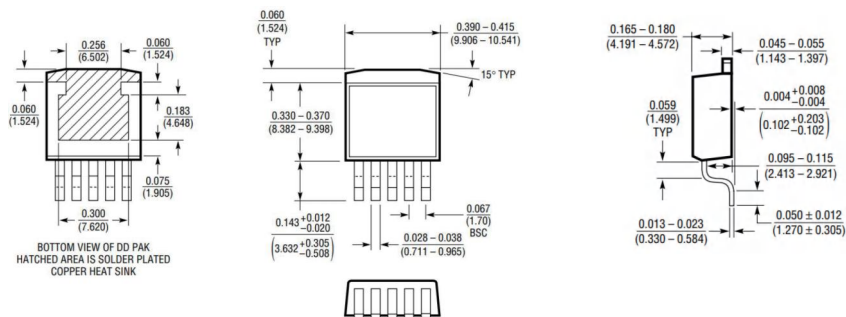


LDO

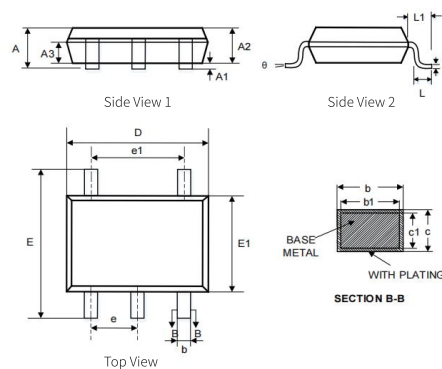
DFN10-EP



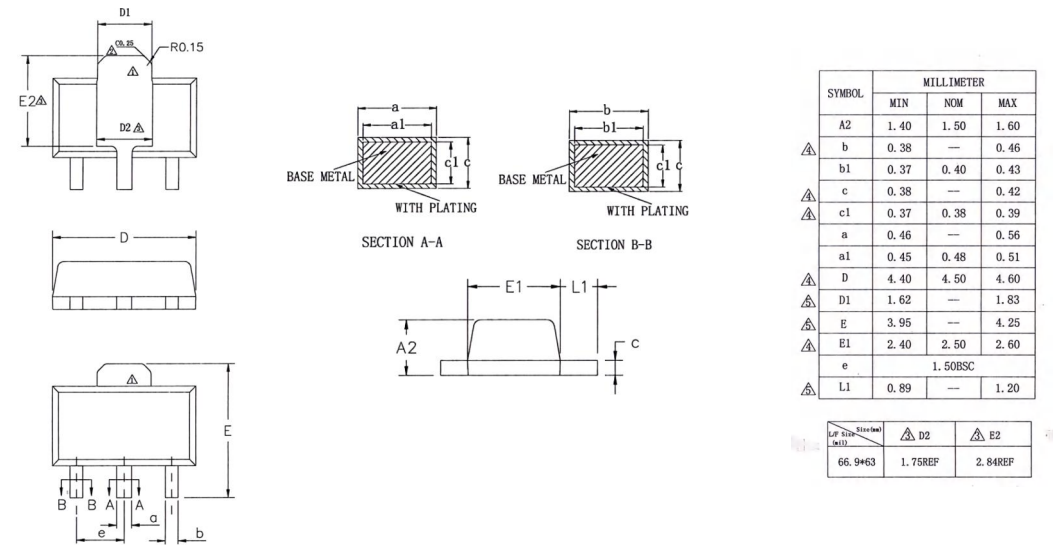
TO-263-5L



SOT-23-5L

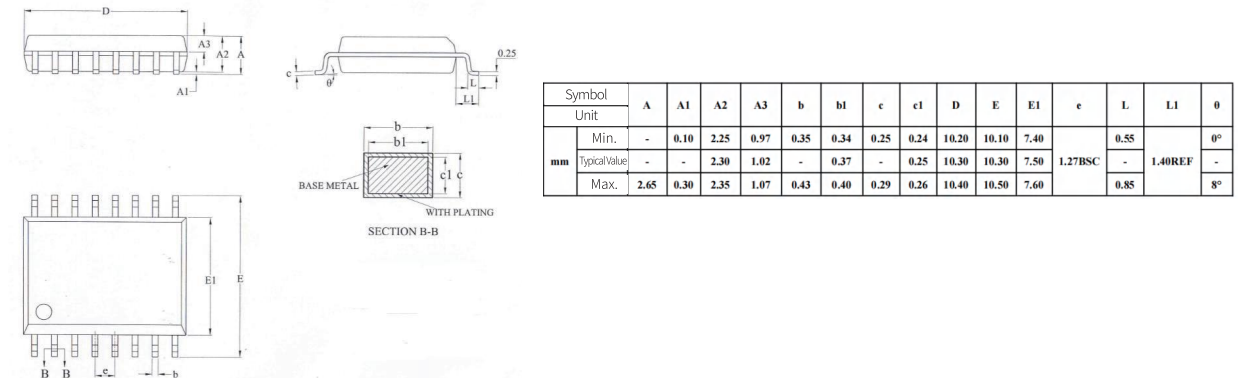


SOT-89-3L

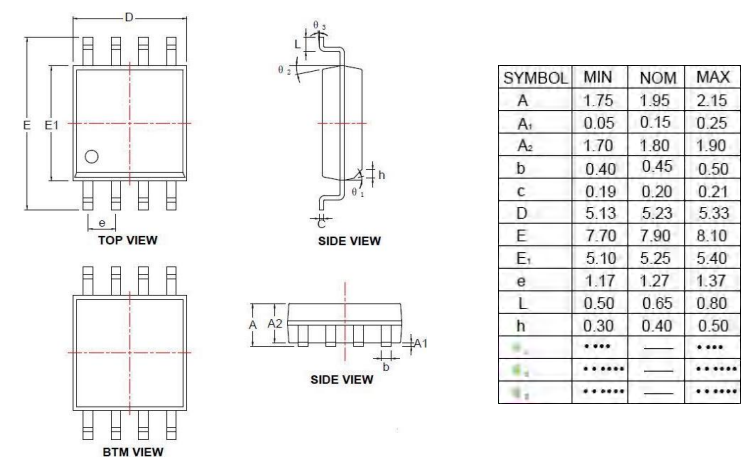


Flash

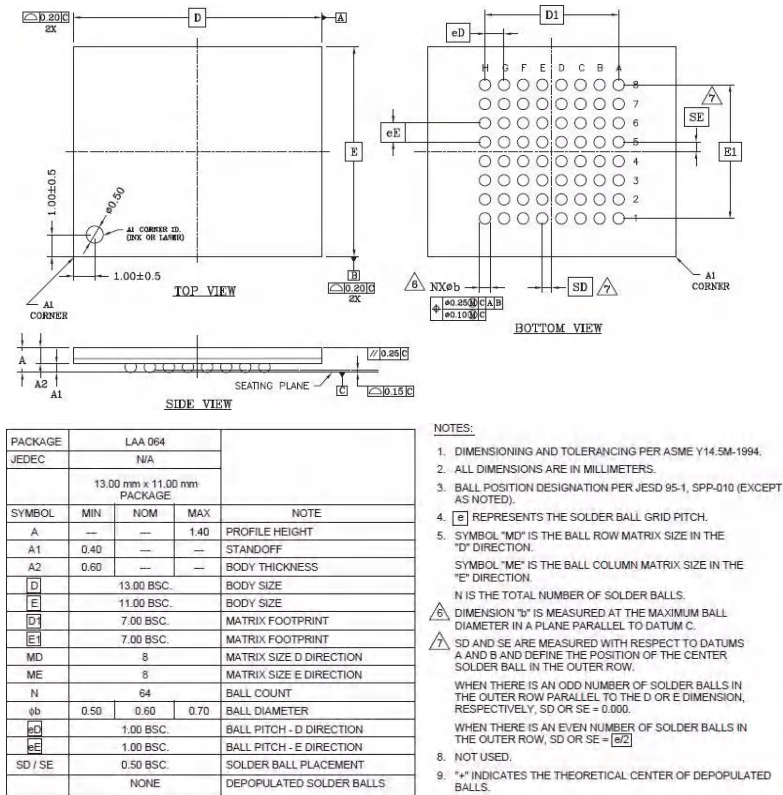
SOP16-300mil



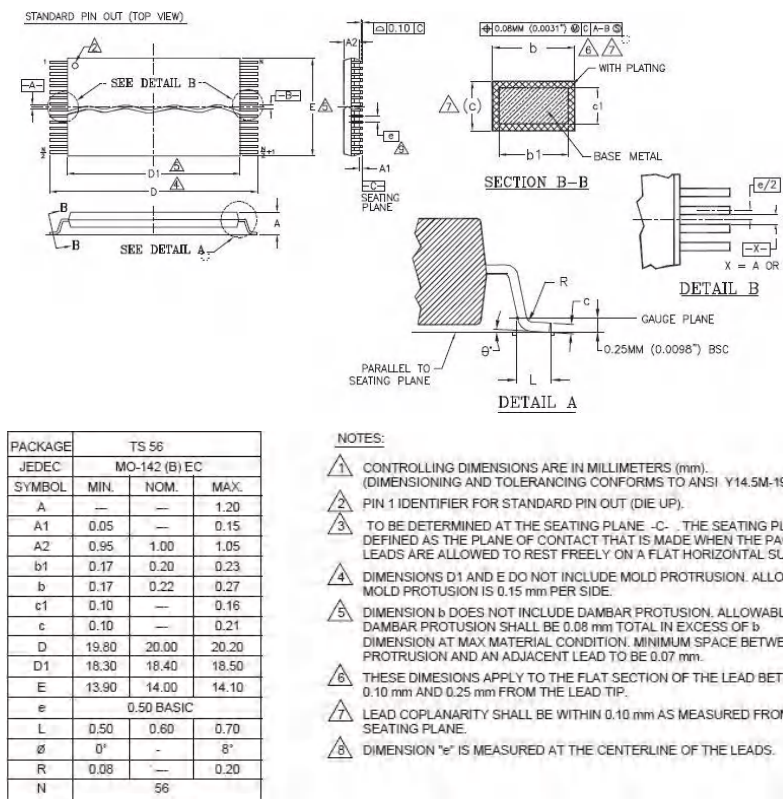
SOP8-208mil



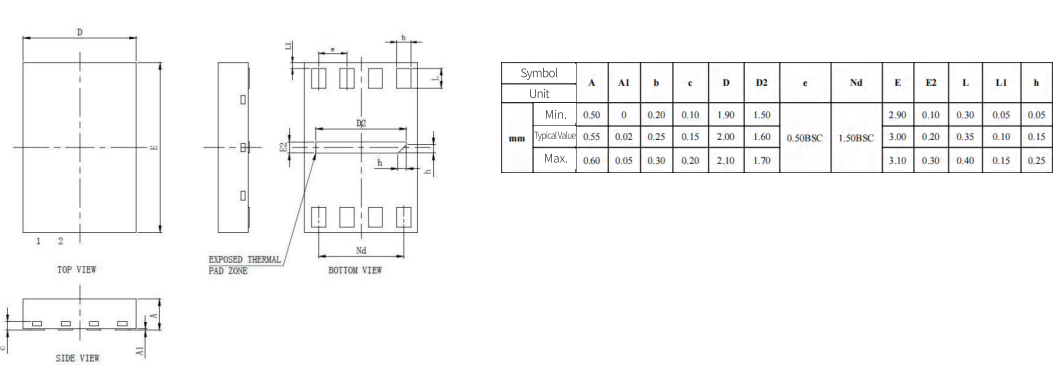
TFBGA11*13-64BALL



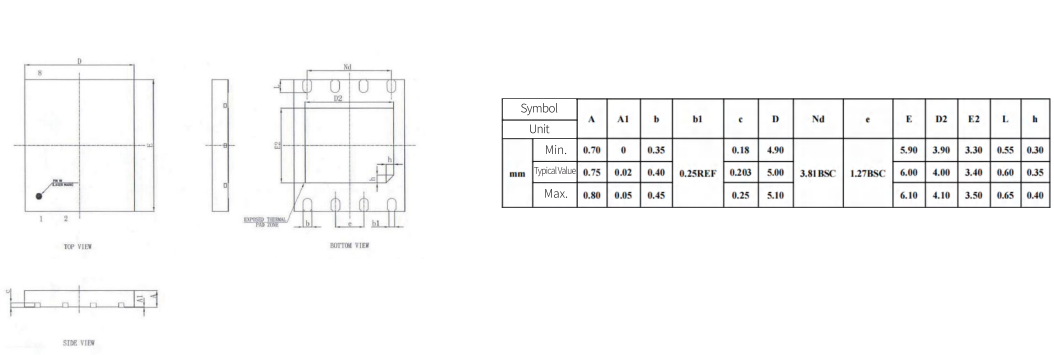
TSOP56 14*20mm



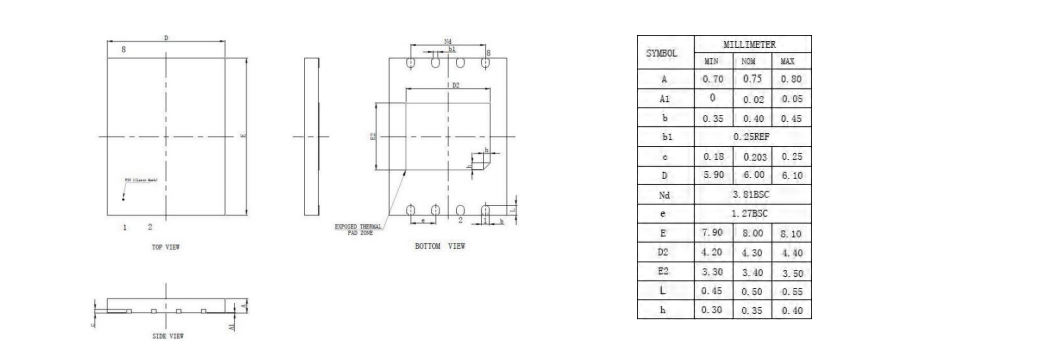
USON8-2*3mm



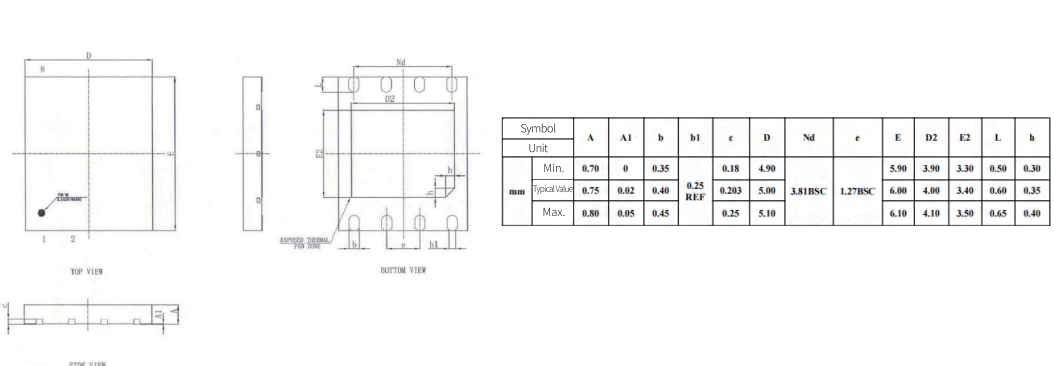
WSON-5*6mm



WSON-6*8mm

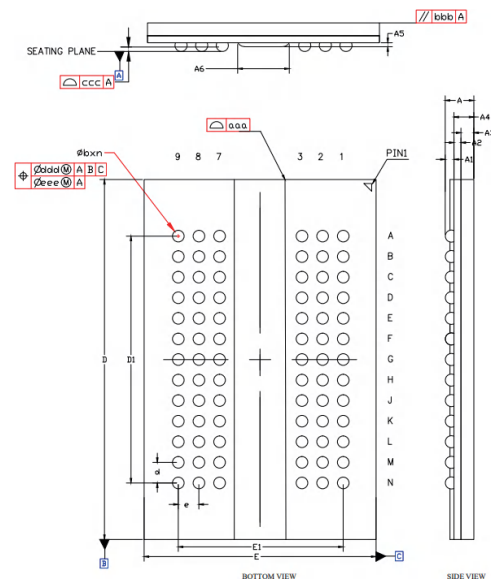


WSON8-5*6mm



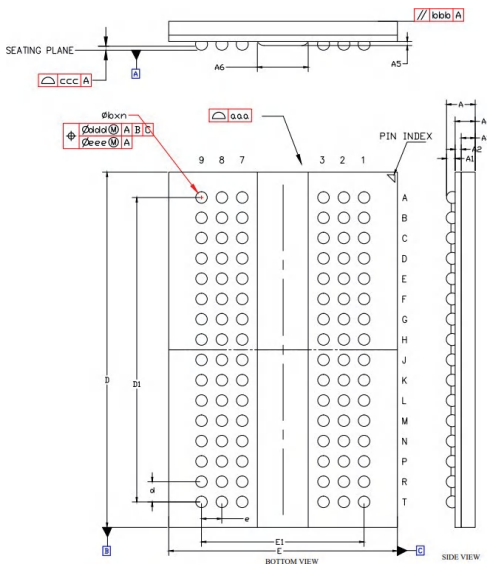
DDR

78 Ball FBGA



	Symbol	Dimension in mm			Dimension in inch		
		Min	Normal	Max	Min	Normal	Max
TOTAL THICKNESS	A	---	1.12	1.20	---	0.0441	0.0472
STAND OFF	A1	0.30	0.34	0.38	0.0118	0.0134	0.0150
SUBSTRATE THICKNESS	A2	0.20	0.23	0.26	0.0079	0.0091	0.0102
MOLD THICKNESS	A3	0.52	0.55	0.58	0.0205	0.0217	0.0228
SBT+MOLD THICKNESS	A4	0.73	0.78	0.83	0.0287	0.0307	0.0327
SLOT THICKNESS	A5	0.142	0.155	0.168	0.0056	0.0061	0.0066
SLOT WIDTH	A6	1.90	2.00	2.10	0.0748	0.0787	0.0827
BALL WIDTH	Φb	0.42	0.47	0.52	0.0165	0.0185	0.0205
BALL PITCH	d	0.8			0.0315		
	e	0.8			0.0315		
BALL COUNT	n	78					
BODY SIZE	D	13.90	14.00	14.10	0.5472	0.5512	0.5551
	E	8.90	9.00	9.10	0.3504	0.3543	0.3583
EDGE BALL CENTER TO CENTER	D1	9.50	9.60	9.70	0.3740	0.3780	0.3819
	E1	6.30	6.40	6.50	0.2480	0.2520	0.2559
PKG EDGE TOLERANCE	aaa	0.10			0.0039		
MOLD FLATNESS	bbb	0.10			0.0039		
COPLANARITY	ccc	0.10			0.0039		
BALL OFFSET(PACKAGE)	ddd	0.15			0.0059		
BALL OFFSET(BALL)	eee	0.05			0.0020		
JEDEC		MO-276(REF)					

96 Ball FBGA



	Symbol	Dimension in mm			Dimension in inch		
		Min	Normal	Max	Min	Normal	Max
TOTAL THICKNESS	A	---	1.12	1.20	---	0.0441	0.0472
STAND OFF	A1	0.30	0.34	0.38	0.0118	0.0134	0.0150
SUBSTRATE THICKNESS	A2	0.20	0.23	0.26	0.0079	0.0091	0.0102
MOLD THICKNESS	A3	0.51	0.55	0.59	0.0201	0.0217	0.0232
SBT+MOLD THICKNESS	A4	0.73	0.78	0.83	0.0287	0.0307	0.0327
SLOT THICKNESS	A5	0.142	0.155	0.168	0.0056	0.0061	0.0066
SLOT WIDTH	A6	1.90	2.00	2.10	0.0748	0.0787	0.0827
BALL WIDTH	Φb	0.42	0.47	0.52	0.0165	0.0185	0.0205
BALL PITCH	d	0.8			0.0315		
	e	0.8			0.0315		
BALL COUNT	n	96					
BODY SIZE	D	13.90	14.00	14.10	0.5472	0.5512	0.5551
	E	8.90	9.00	9.10	0.3504	0.3543	0.3583
EDGE BALL CENTER TO CENTER	D1	11.90	12.00	12.10	0.4685	0.4724	0.4764
	E1	6.30	6.40	6.50	0.2480	0.2520	0.2559
PKG EDGE TOLERANCE	aaa	0.10			0.0039		
MOLD FLATNESS	bbb	0.10			0.0039		
COPLANRITY	ccc	0.10			0.0039		
BALL OFFSET(PACKAGE)	ddd	0.15			0.0059		
BALL OFFSET(BALL)	eee	0.05			0.0020		
JEDEC		MO-276(REF)					