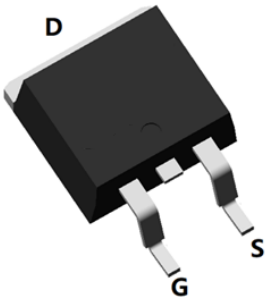
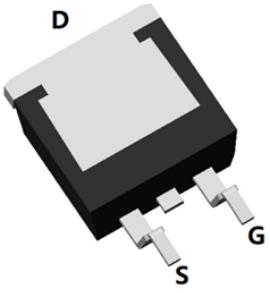
N-Channel Enhancement Mode Field Effect Transistor

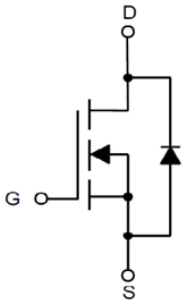


Top View



Bottom View

TO-263



Product Summary

- V_{DS} 60V
- I_D 220A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜2.3mΩ
- 100% EAS Tested
- 100% ▽V_{DS} Tested

General Description

- Split gate trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Halogen Free
- Epoxy Meets UL 94 V-0 Flammability Rating

Applications

- Power switching application
- Uninterruptible power supply
- DC-DC convertor

■ Limiting Values

Parameter	Conditions		Symbol	Min	Max	Unit
Drain-source Voltage			V_{DS}	-	60	V
Gate-source Voltage			V_{GS}	-20	20	
Continuous Drain Current (Note 1,2)	Steady-State	T_A=25℃,V_{GS}= 10V	I_D	-	28.4	A
		T_A=100℃,V_{GS}= 10V		-	20.1	
Continuous Drain Current (Note 1,3)	Steady-State	T_C=25℃,V_{GS}= 10V,Chip limitation		-	220	
		T_C=100℃,V_{GS}= 10V		-	155	
Pulsed Drain Current	T_C=25℃,t_p≤10μs		I_{DM}	-	880	
Maximum Body-Diode Continuous Current	T_C=25℃		I_S		155	
Avalanche Energy (non-repetitive)	T_J=25℃,V_G=10V,R_G=25Ω,L=0.5mH,I_{AS}=45A		EAS	-	506.25	mJ
Total Power Dissipation (Note 1,2)	Steady-State	T_A=25℃	P_D	-	3.4	W
		T_A=100℃		-	1.7	
Total Power Dissipation (Note 1,3)	Steady-State	T_C=25℃		-	208	
		T_C=100℃		-	104	
Junction and Storage Temperature Range			T_J ,T_{STG}	-55	175	℃

■Thermal Resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient (Note 2)	Steady-State	$R_{\theta JA}$	-	43	℃/W
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	-	0.72	

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
B2D3G06H	F2	B2D3G06H	800	/	4000	13“ reel

■ Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=1mA,Tj=25℃	60	-	-	V
		V_{GS}=0V,I_D=10mA,Tj=25℃	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=48V,V_{GS}=0V,Tj=25℃	-	-	1	μA
		V_{DS}=48V,V_{GS}=0V,Tj=100℃	-	-	100	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V,Tj=25℃	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA,Tj=25℃	2.2	3	3.8	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=20A,Tj=25℃	-	1.84	2.3	mΩ
Diode Forward Voltage	V_{SD}	I_S=20A,V_{GS}=0V,Tj=25℃	-	0.78	1.2	V
Gate Resistance	R_G	f=1MHz,Tj=25℃	-	2.5	-	Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=30V,V_{GS}=0V,f=0.5MHz,Tj=25℃	-	4770	-	pF
Output Capacitance	C_{oss}		-	1900	-	
Reverse Transfer Capacitance	C_{rss}		-	210	-	
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=30V,I_D=20A,Tj=25℃	-	79	-	nC
Gate-Source Charge	Q_{gs}		-	19	-	
Gate-Drain Charge	Q_{gd}		-	22	-	
Reverse Recovery Charge	Q_{rr}	I_F=20A,di/dt=100A/μs,V_{GS}=0V,V_R=30V, Tj=25℃	-	35	-	nC
Reverse Recovery Time	t_{rr}		-	38	-	ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V,V_{DS}=30V,I_D=20A,R_{GEN}=3Ω, Tj=25℃	-	19	-	ns
Turn-on Rise Time	t_r		-	38	-	
Turn-off Delay Time	$t_{D(off)}$		-	58	-	
Turn-off Fall Time	t_f		-	55	-	

Note：

1. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
2. The value of $R_{\theta JA}$ is measured with the device mounted on the 40mm*40mm*1.1mm single layer FR-4 PCB board with 1 in^2 pad of 2oz. Copper, in the still air environment with T_A=25℃.The maximum allowed junction temperature of 175℃. The value in any given application depends on the user's specific board design.

■Typical Electrical and Thermal Characteristics Diagrams

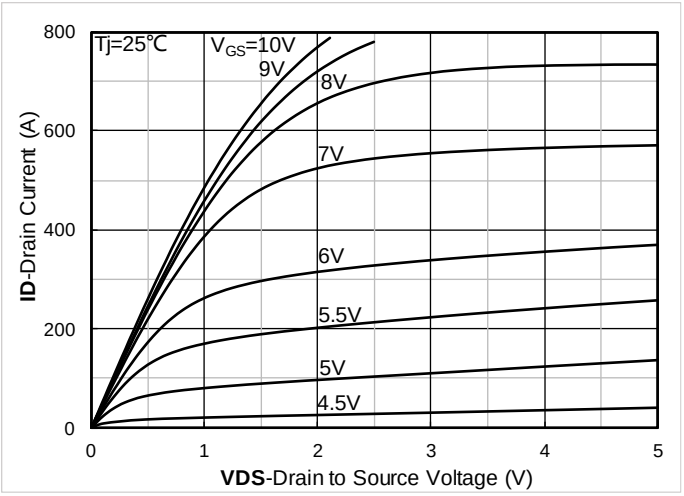


Figure 1. Output Characteristics; typical values

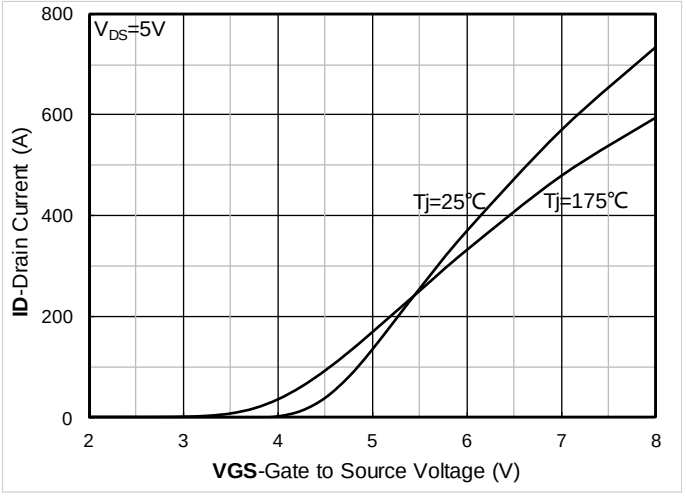


Figure 2. Transfer Characteristics; typical values

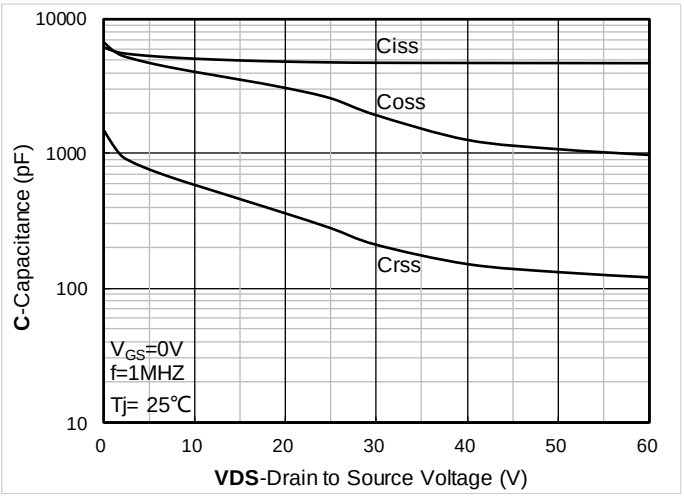


Figure 3. Capacitance Characteristics; typical values

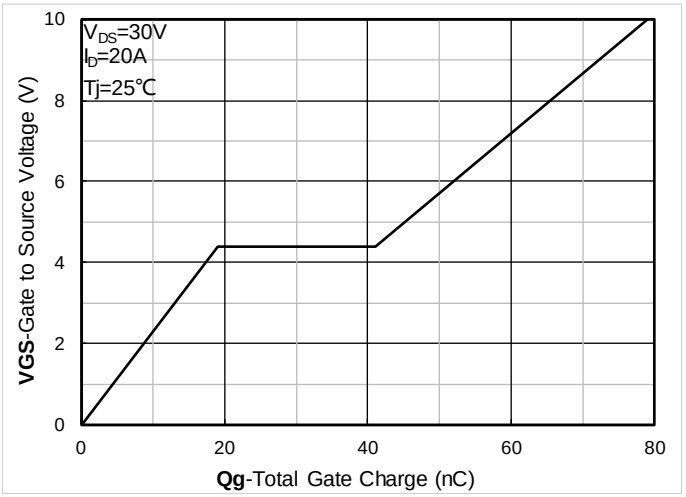


Figure 4. Gate Charge; typical values

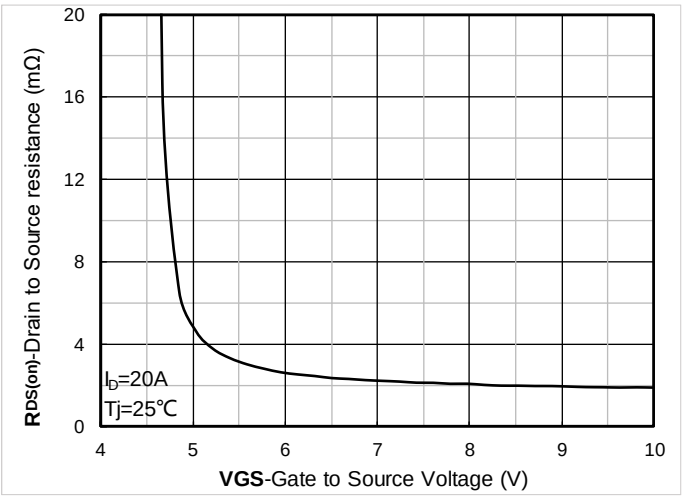


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

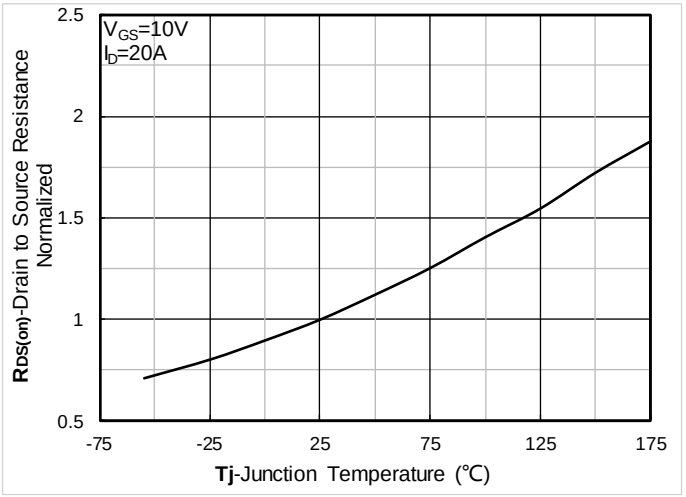


Figure 6. Normalized On-Resistance

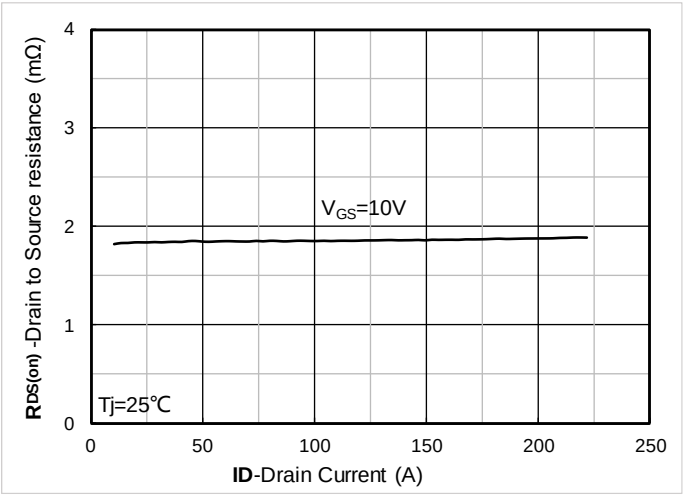


Figure 7. $R_{DS(on)}$ vs. Drain Current; typical values

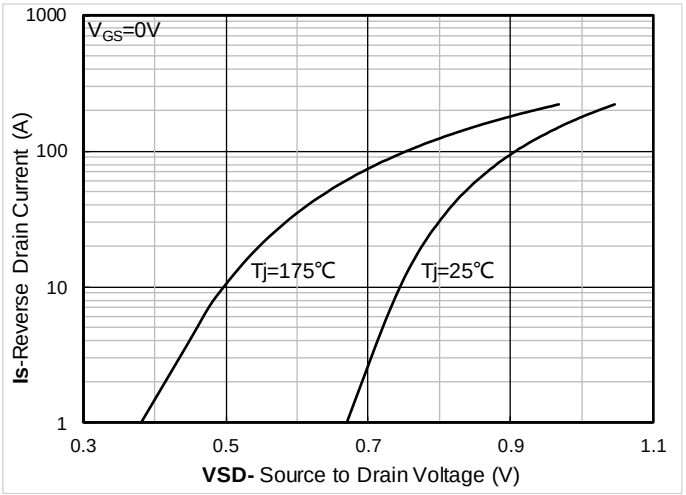


Figure 8. Forward characteristics of reverse diode; typical values

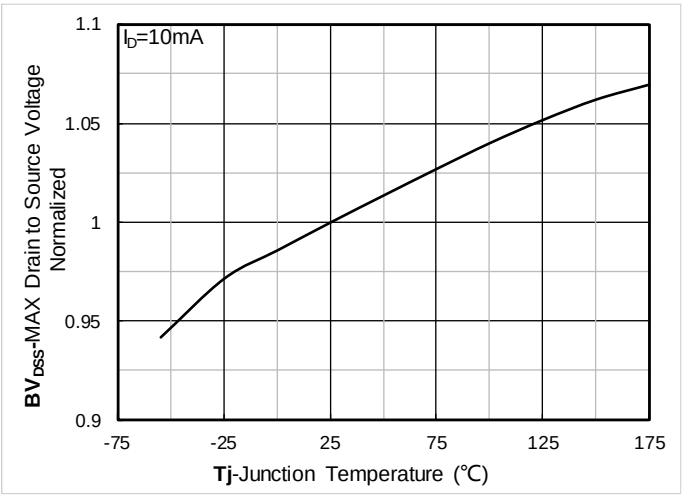


Figure 9. Normalized breakdown voltage

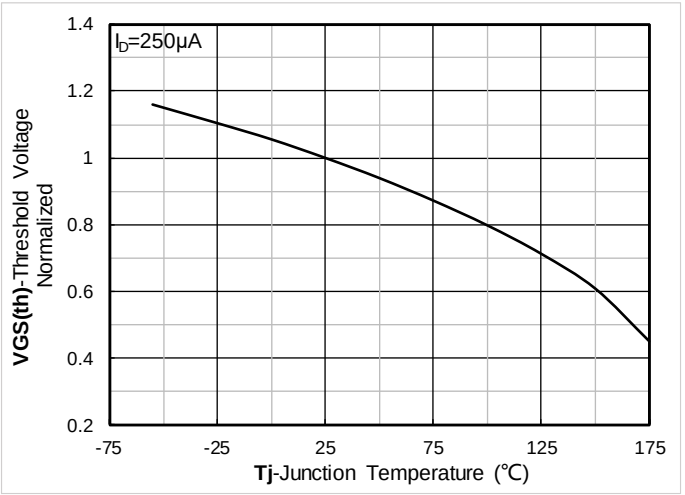


Figure 10. Normalized Threshold voltage

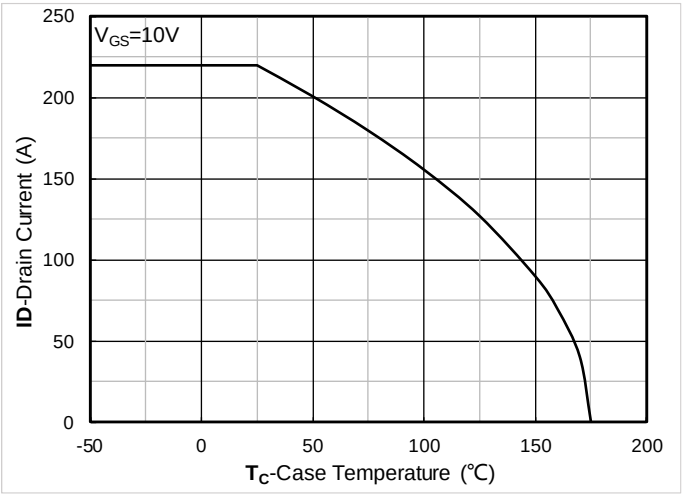


Figure 11. Current dissipation

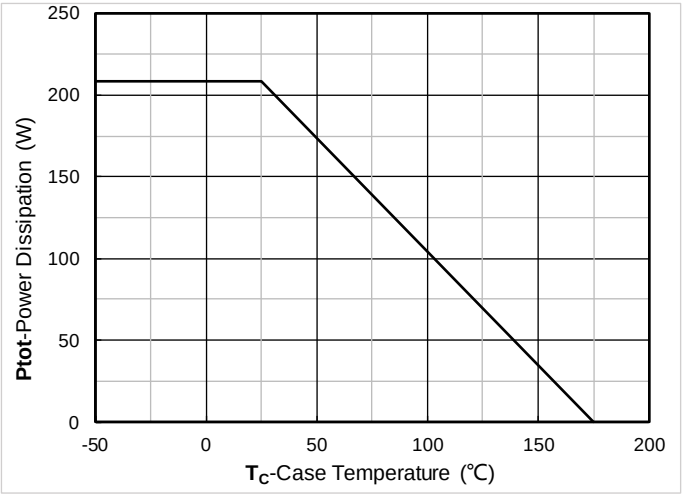


Figure 12. Power dissipation

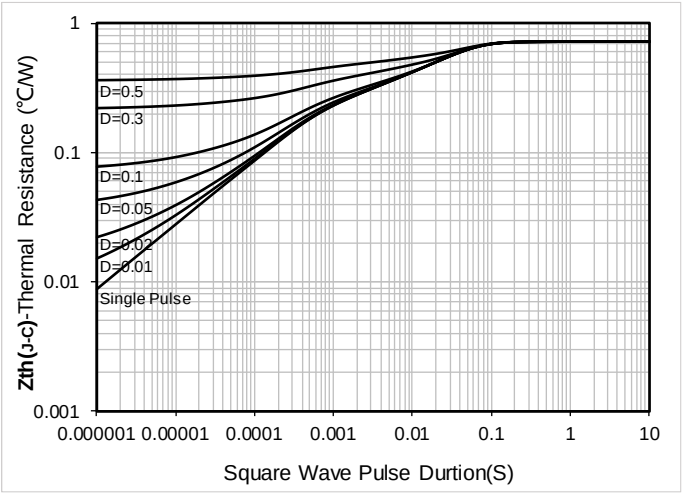


Figure 13. Maximum Transient Thermal Impedance

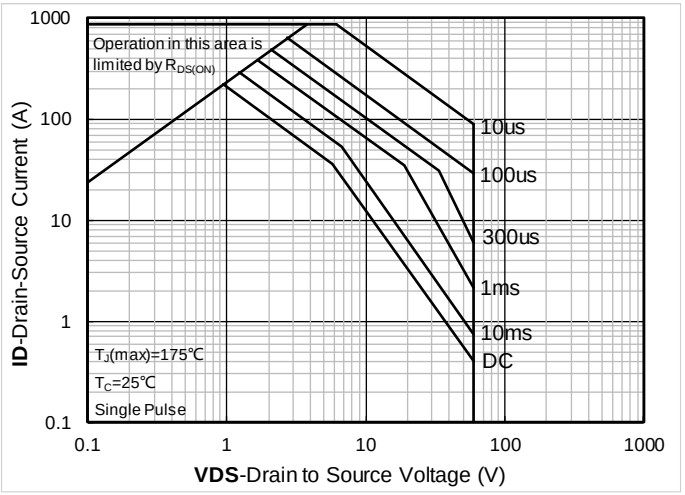
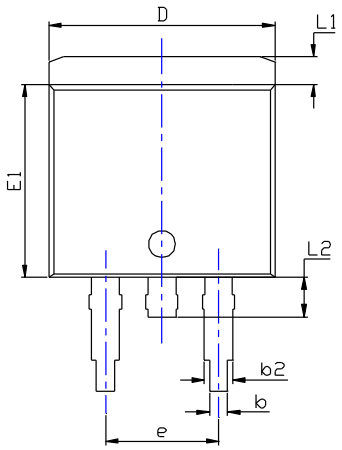
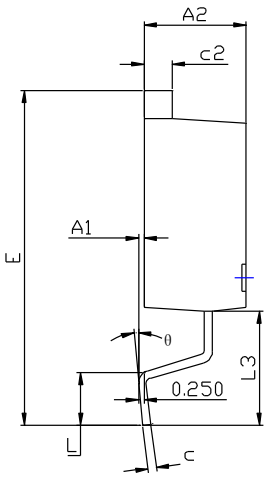


Figure 14. Safe Operation Area

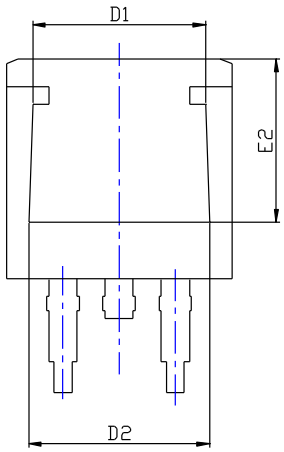
■ TO-263-HY Package information



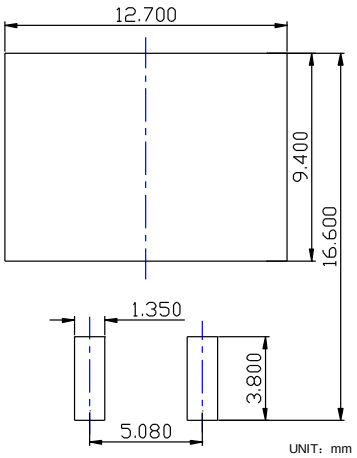
TOP VIEW



SIDE VIEW



BOTTOM VIEW

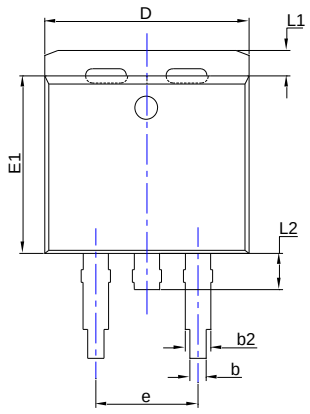


SUGGESTED SOLDER PAD LAYOUT

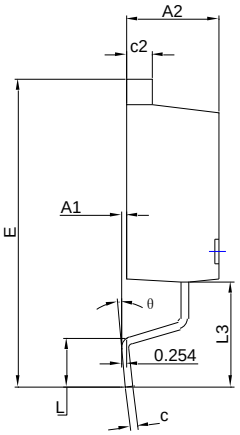
DIMENSIONS						
SYMBOL	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A1	0.000	---	0.010	0.000	---	0.250
A2	0.174	0.180	0.186	4.430	4.580	4.730
b	0.028	0.032	0.036	0.720	0.820	0.920
b2	0.046	0.050	0.054	1.180	1.280	1.380
c	0.013	0.015	0.018	0.330	0.390	0.450
c2	0.048	0.050	0.053	1.220	1.280	1.340
D	0.394	0.400	0.406	10.000	10.150	10.300
D1	0.295	0.307	0.319	7.500	7.800	8.100
D2	0.303	0.315	0.327	7.700	8.000	8.300
E	0.571	0.591	0.610	14.500	15.000	15.500
E1	0.337	0.341	0.348	8.550	8.700	8.850
E2	0.276	0.287	0.299	7.000	7.300	7.600
e	0.200BSC			5.080BSC		
L	0.070	---	0.110	1.790	---	2.790
L1	0.044	---	0.056	1.120	---	1.420
L2	0.030	---	0.070	0.770	---	1.770
L3	0.197REF			5.000REF		
θ	0°	---	8°	0°	---	8°

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.

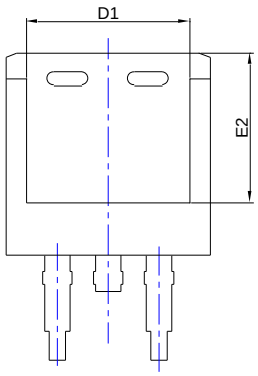
■ TO-263-B Package information



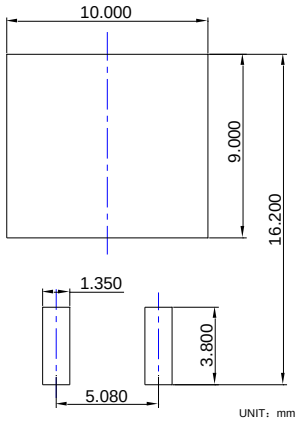
TOP VIEW



SIDE VIEW



BOTTOM VIEW



SUGGESTED SOLDER PAD LAYOUT

DIMENSIONS				
SYMBOL	INCHES		MILLIMETER	
	MIN.	MAX.	MIN.	MAX.
A1	0.000	0.010	0.000	0.254
A2	0.160	0.190	4.064	4.826
b	0.020	0.039	0.508	0.991
b2	0.045	0.070	1.143	1.778
c	0.015	0.029	0.381	0.737
c2	0.045	0.065	1.143	1.651
D	0.380	0.420	9.652	10.668
D1	0.245	---	6.223	---
E	0.575	0.625	14.605	15.875
E1	0.330	0.380	8.382	9.652
E2	0.270	---	6.858	---
e	0.200BSC		5.08BSC	
L	0.070	0.110	1.778	2.794
L1	---	0.066	---	1.676
L2	---	0.070	---	1.778
L3	0.188	0.208	4.780	5.280
θ	0°	8°	0°	8°

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.

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