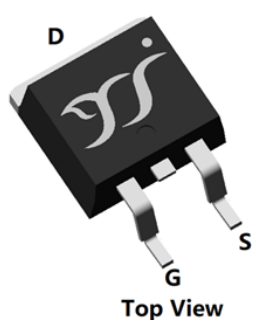
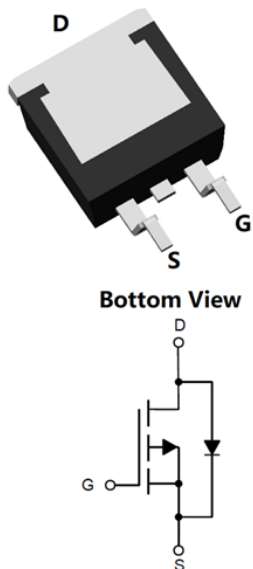


P-Channel Enhancement Mode Field Effect Transistor



TO-263



Product Summary

• V_{DS}	-100V
• I_D	-42A
• $R_{DS(ON)}$ (at $V_{GS}=-10V$)	<34m Ω
• $R_{DS(ON)}$ (at $V_{GS}=-4.5V$)	<40m Ω
• 100% EAS Tested	
• 100% ∇V_{DS} Tested	
• ESD Level(HBM)	H2

General Description

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

Applications

- 48V Port

Limiting Values

Parameter	Conditions		Symbol	Min	Max	Unit
Drain-Source Voltage			V_{DS}	-	-100	V
Gate-Source Voltage			V_{GS}	-20	20	
Continuous Drain Current (Note 1,2)	Steady-State	$T_A=25^{\circ}\text{C}, V_{GS}=-10\text{V}$	I_D	-	-6.6	A
		$T_A=100^{\circ}\text{C}, V_{GS}=-10\text{V}$		-	-4.7	
Continuous Drain Current (Note 1,3)	Steady-State	$T_C=25^{\circ}\text{C}, V_{GS}=-10\text{V}, \text{Chip limitation}$		-	-42	
		$T_C=100^{\circ}\text{C}, V_{GS}=-10\text{V}$		-	-29.7	
Pulsed Drain Current	$T_C=25^{\circ}\text{C}, t_p \leq 10\mu\text{s}$		I_{DM}	-	-168	
Maximum Body-Diode Continuous Current	$T_C=25^{\circ}\text{C}$		I_S		-42	
Avalanche Energy (non-repetitive)	$T_J=25^{\circ}\text{C}, V_G=-10\text{V}, R_G=25\Omega, L=0.5\text{mH}, I_{AS}=-31.5\text{A}$		EAS	-	248	mJ
Total Power Dissipation (Note 1,2)	Steady-State	$T_A=25^{\circ}\text{C}$	P_D	-	3.48	W
		$T_A=100^{\circ}\text{C}$		-	1.74	
Total Power Dissipation (Note 1,3)	Steady-State	$T_C=25^{\circ}\text{C}$		-	144.2	
		$T_C=100^{\circ}\text{C}$		-	72.1	
Junction and Storage Temperature Range			T_J, T_{STG}	-55	175	$^{\circ}\text{C}$

Thermal Resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient (Note 2)	Steady-State	$R_{\theta JA}$	-	43	$^{\circ}\text{C/W}$
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	-	1.04	



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■ Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-1mA, T_j=25^{\circ}C$	-100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-100V, V_{GS}=0V, T_j=25^{\circ}C$	-	-	-1	μA
		$V_{DS}=-100V, V_{GS}=0V, T_j=125^{\circ}C$	-	-	-100	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V, T_j=25^{\circ}C$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A, T_j=25^{\circ}C$	-1.3	-1.8	-2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-25A, T_j=25^{\circ}C$	-	25	34	m Ω
		$V_{GS}=-4.5V, I_D=-13A, T_j=25^{\circ}C$	-	27	40	m Ω
Diode Forward Voltage	V_{SD}	$I_S=-25A, V_{GS}=0V, T_j=25^{\circ}C$	-	-0.83	-1.2	V
Gate Resistance	R_G	$f=1MHz, T_j=25^{\circ}C$	-	8	-	Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=-50V, V_{GS}=0V, f=1MHz, T_j=25^{\circ}C$	-	5404		pF
Output Capacitance	C_{oss}		-	241		
Reverse Transfer Capacitance	C_{rss}		-	191	-	
Total Gate Charge	Q_g	$V_{GS}=-10V, V_{DS}=-50V, I_D=-25A, T_j=25^{\circ}C$	-	121.3	-	nC
Gate-Source Charge	Q_{gs}		-	17.2	-	
Gate-Drain Charge	Q_{gd}		-	25	-	
Reverse Recovery Charge	Q_{rr}	$I_F=-25A, di/dt=100A/\mu s, V_{GS}=0V, V_R=-50V, T_j=25^{\circ}C$	-	60.3	-	nC
Reverse Recovery Time	t_{rr}		-	35.9	-	ns
Turn-On Delay Time	$t_{D(on)}$	$V_{GS}=-10V, V_{DS}=-50V, I_D=-25A, R_{GEN}=3\Omega, T_j=25^{\circ}C$	-	12.8	-	ns
Turn-On Rise Time	t_r		-	40.3	-	
Turn-Off Delay Time	$t_{D(off)}$		-	172.7	-	
Turn-Off Fall Time	t_f		-	114.1	-	

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 in² pad of 2oz. Copper, in the still air environment with $T_A=25^{\circ}C$. The maximum allowed junction temperature of $175^{\circ}C$. The value in any given application depends on the user's specific board design.
3. Thermal resistance from junction to soldering point (on the exposed drain pad).

■ Typical Electrical and Thermal Characteristics Diagrams

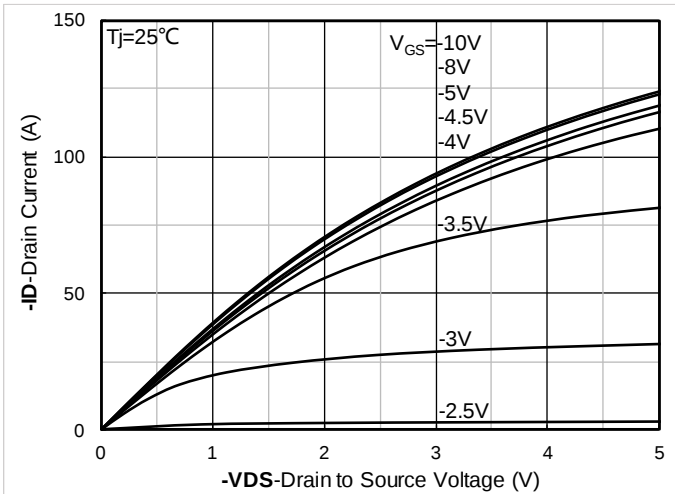


Figure 1. Output Characteristics; typical values

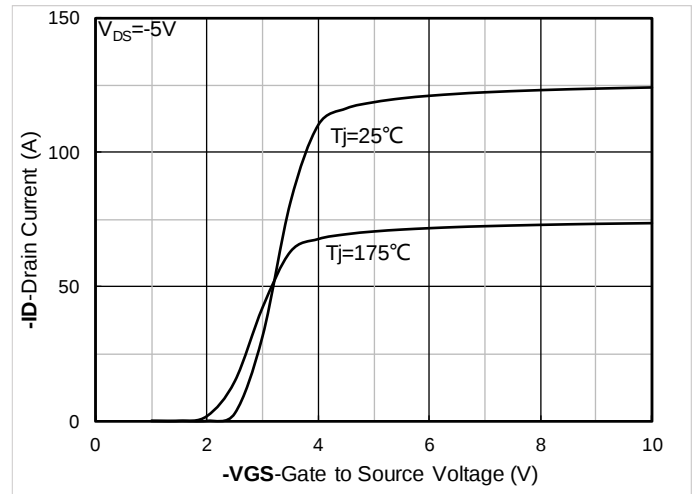


Figure 2. Transfer Characteristics; typical values

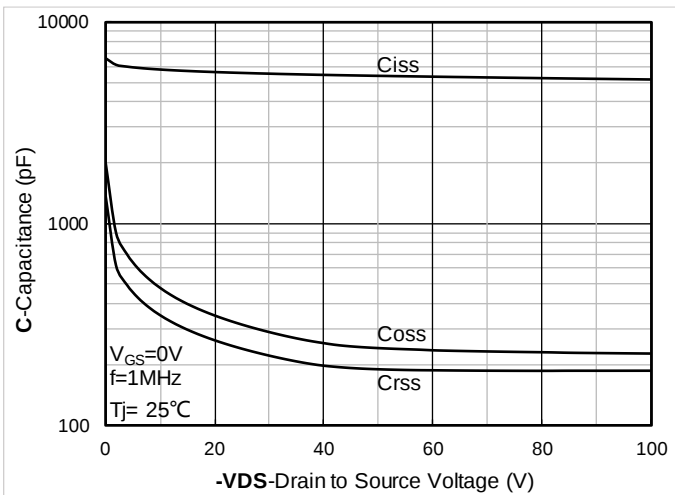


Figure 3. Capacitance Characteristics; typical values

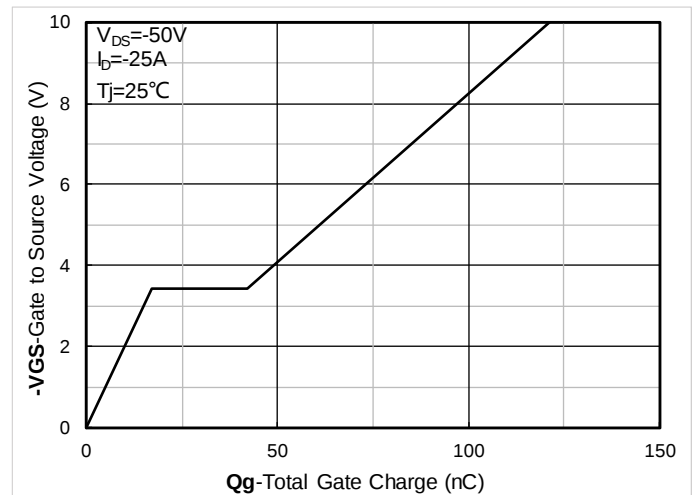


Figure 4. Gate Charge; typical values

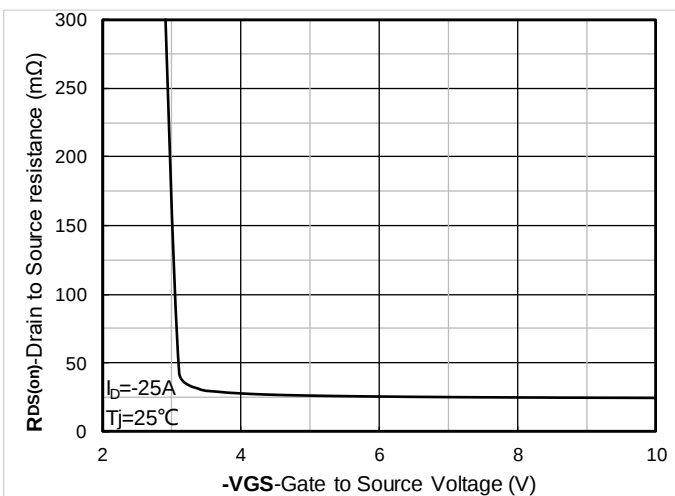


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

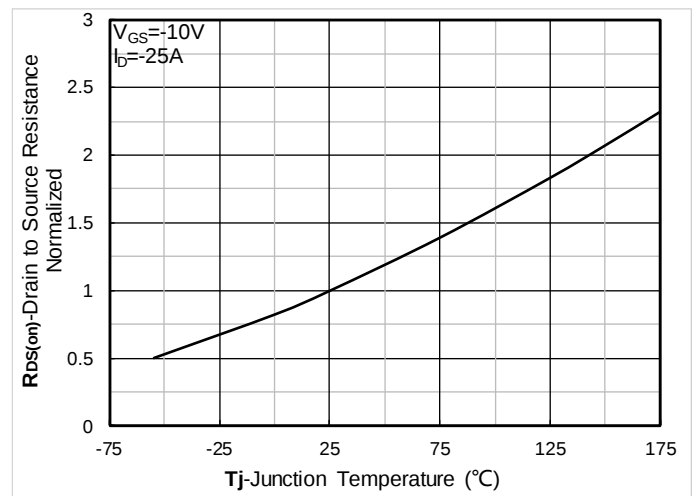


Figure 6. Normalized On-Resistance

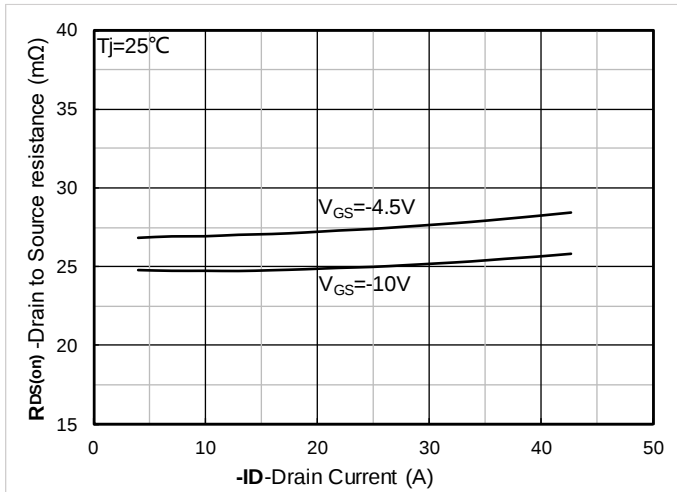


Figure 7. RDS(on) vs. Drain Current; typical values

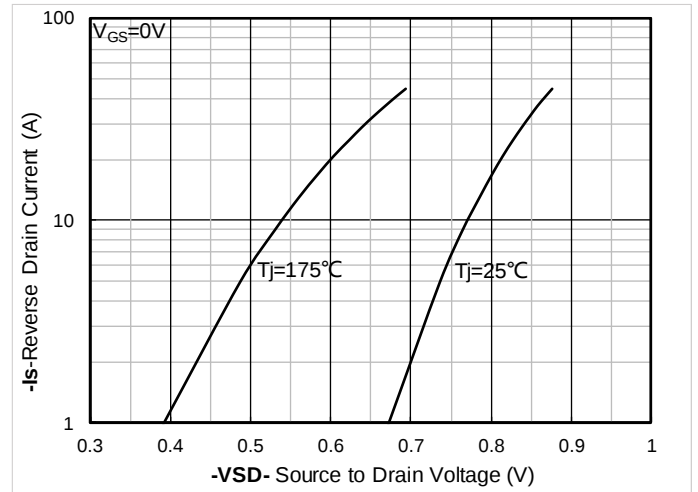


Figure 8. Forward characteristics of reverse diode; typical values

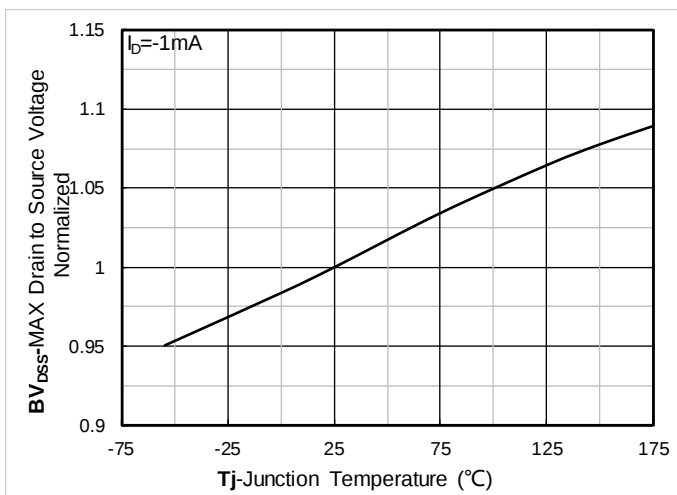


Figure 9. Normalized breakdown voltage

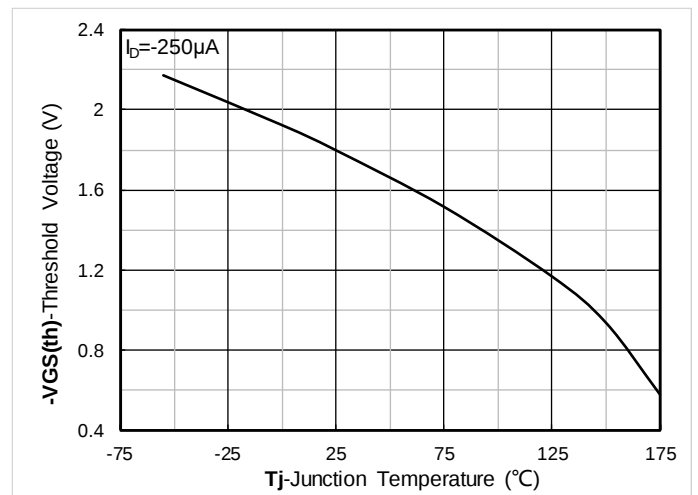


Figure 10. Gate Threshold voltage; typical values

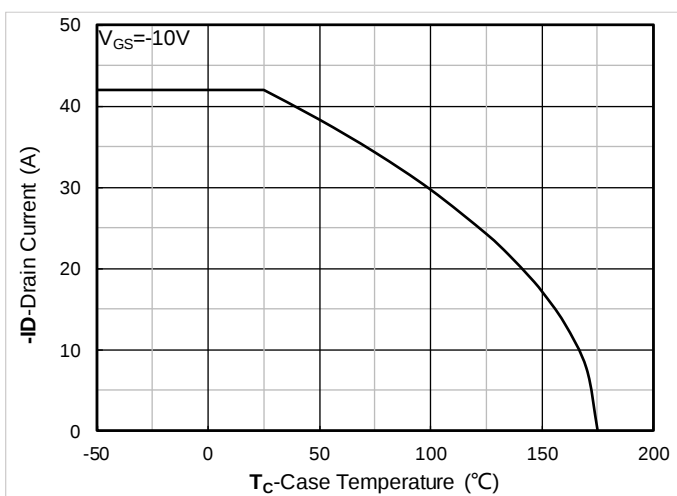


Figure 11. Current dissipation

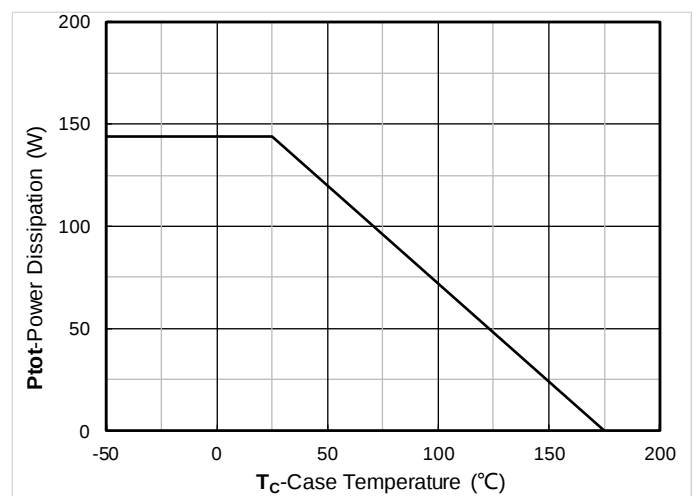


Figure 12. Power dissipation

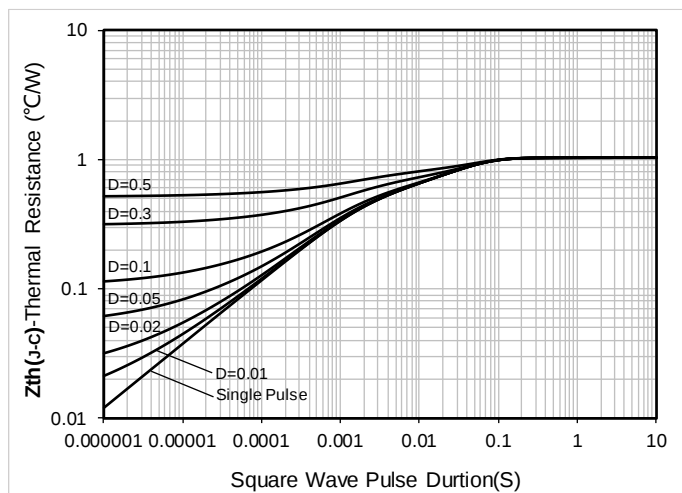


Figure 13. Maximum Transient Thermal Impedance

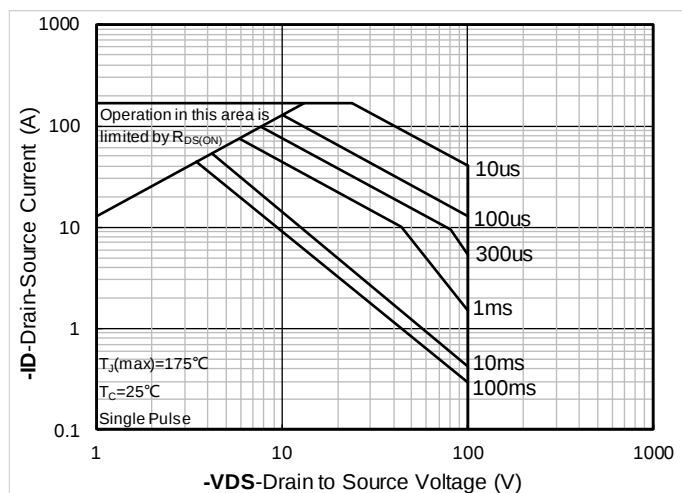
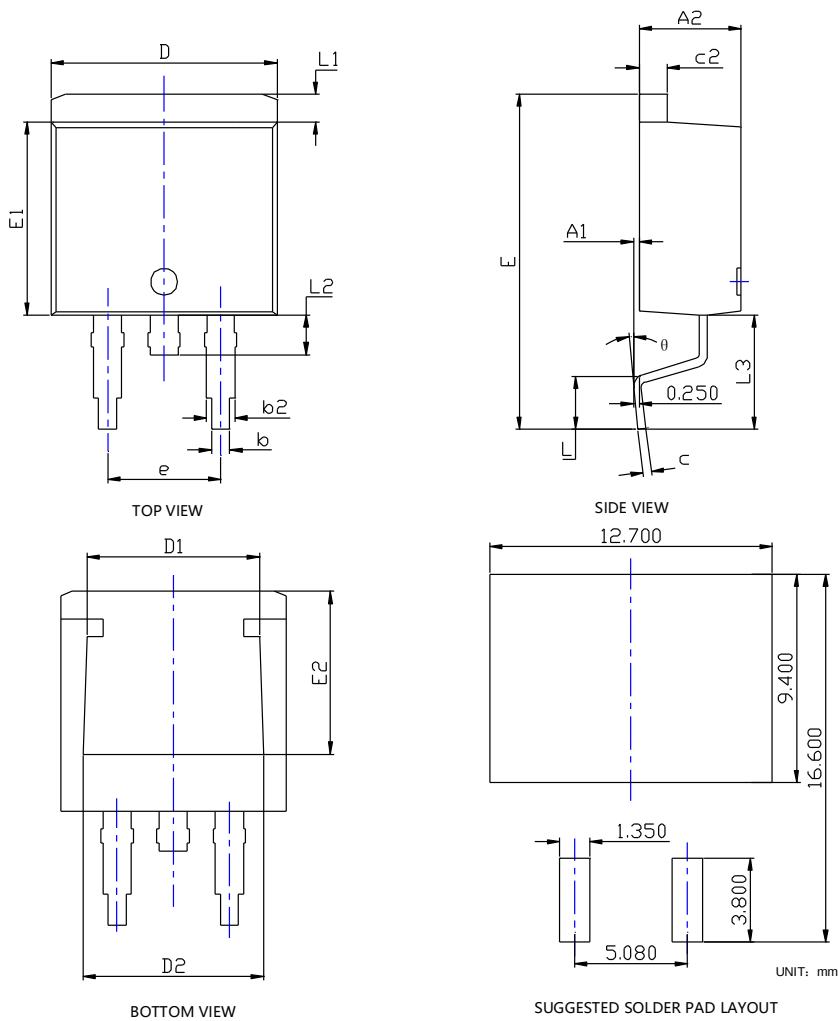


Figure 14. Safe Operation Area



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■ TO-263-HY Package information

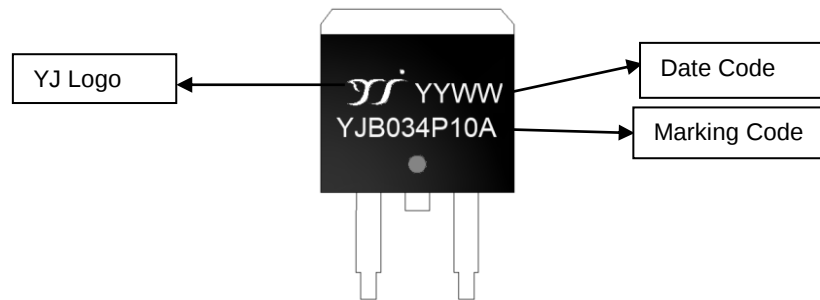


SYMBOL	DIMENSIONS					
	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A1	0.000	---	0.010	0.000	---	0.250
A2	0.174	0.180	0.186	4.430	4.580	4.730
b	0.028	0.032	0.036	0.720	0.820	0.920
b2	0.046	0.050	0.054	1.180	1.280	1.380
c	0.013	0.015	0.018	0.330	0.390	0.450
c2	0.048	0.050	0.053	1.220	1.280	1.340
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.

■ Marking Information



Note:

1. All marking is at middle of the product body
2. All marking is in laser printing
3. YYWW is date code, "YY" is year, "WW" is week
4. Body color: Black



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