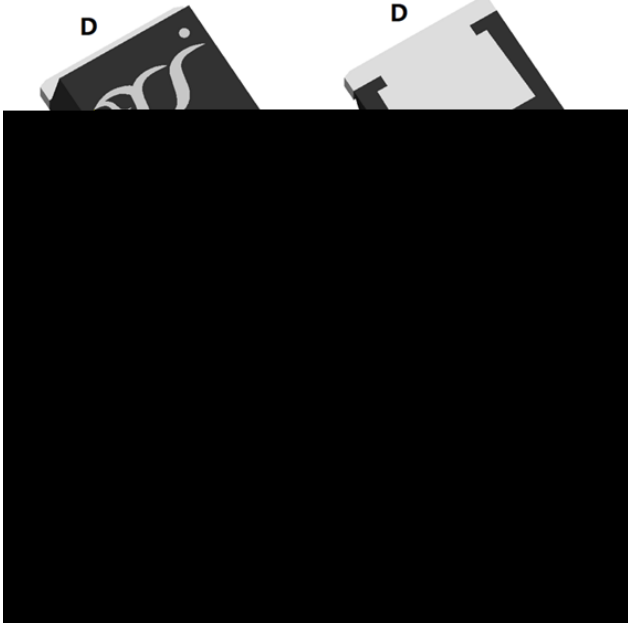


## N-Channel Enhancement Mode Field Effect Transistor



### Product Summary

- $V_{DS}$  100V
- $I_D$  70A
- $R_{DS(ON)}$ ( at  $V_{GS}=10V$ ) <8.6 mohm
- $R_{DS(ON)}$ ( at  $V_{GS}=6V$ ) <13 mohm
- 100% EAS Tested
- 100%  $\nabla V_{DS}$  Tested

### General Description

- Low  $R_{DS(on)}$  & FOM
- Extremely low switching loss
- Excellent stability and uniformity
- Fast switching and soft recovery
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

### Applications

- Power switching application
- Hard switched and high frequency circuits
- UPS

### ■ Absolute Maximum Ratings ( $T_A=25^\circ C$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		$V_{DS}$	100	V
Gate-source Voltage		$V_{GS}$	$\pm 20$	V
Drain Current <sup>A</sup> (Package Limited)	$T_A=25$	$I_D$	10	A
	$T_A=100$		6	
	$T_C=25^\circ C$		70	
	$T_C=100^\circ C$		44	
Pulsed Drain Current <sup>B</sup>		$I_{DM}$	280	A
Avalanche energy <sup>C</sup>		EAS	200	mJ
Total Power Dissipation <sup>D</sup>	$T_A=25$	$P_D$	2	W
	$T_A=100$		0.8	
	$T_C=25^\circ C$		125	
	$T_C=100^\circ C$		50	
Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~+150	$^\circ C$

### ■ Thermal resistance

		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient <sup>E</sup>	$t \leq 10S$	$R_{\theta JA}$	12	15	$^\circ C/W$
Thermal Resistance Junction-to-Ambient <sup>E</sup>	Steady-State		50	60	
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	0.8	1.0	

### ■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJB70G10B	F2	YJB70G10B	800	/	8000	13" reel



# YJB70G10B

## ■ Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	100			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V			1	μA
		V <sub>DS</sub> =100V, V <sub>GS</sub> =0V, T <sub>J</sub> =150			100	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	2	2.8	4	V
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> =20A		7.2	8.6	mΩ
		V <sub>GS</sub> = 6V, I <sub>D</sub> =20A		10	13	mΩ
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =20A, V <sub>GS</sub> =0V			1.3	V
Maximum Body-Diode Continuous Current	I <sub>S</sub>				70	A
Gate resistance	R <sub>G</sub>	f= 1 MHz		0.68		Ω
<b>Dynamic Parameters</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHZ		2270		pF
Output Capacitance	C <sub>oss</sub>			797		
Reverse Transfer Capacitance	C <sub>rss</sub>			36		
<b>Switching Parameters</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =50V, I <sub>D</sub> =25A		32		nC
Gate-Source Charge	Q <sub>gs</sub>			11.1		
Gate-Drain Charge	Q <sub>gd</sub>			4.78		
Reverse Recovery Chrage	Q <sub>rr</sub>	I <sub>F</sub> =20A, di/dt=100A/us		84		ns
Reverse Recovery Time	t <sub>rr</sub>			51.5		
Turn-on Delay Time	t <sub>D(on)</sub>	V <sub>GS</sub> =10V, V <sub>DD</sub> =50V, I <sub>D</sub> =25A R <sub>GEN</sub> =2.2Ω		51		ns
Turn-on Rise Time	t <sub>r</sub>			14.4		
Turn-off Delay Time	t <sub>D(off)</sub>			69.2		
Turn-off fall Time	t <sub>f</sub>			20.6		

- A. The maximum current rating is package limited.  
 B. Repetitive rating; pulse width limited by max. junction temperature.  
 C. V<sub>DD</sub>=50V, R<sub>G</sub>=25Ω, L=0.5mH, starting T<sub>J</sub>=25 .  
 D. Pd is based on max. junction temperature, using junction-case thermal resistance.  
 E. The value of R<sub>θJA</sub> is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=25 C. The Power dissipation PDSM is based on R<sub>θJA</sub> ≤ 10s and the maximum allowed junction temperature of 150 C. The value in any given application depends on the user's specific board design.



## Typical Performance Characteristics

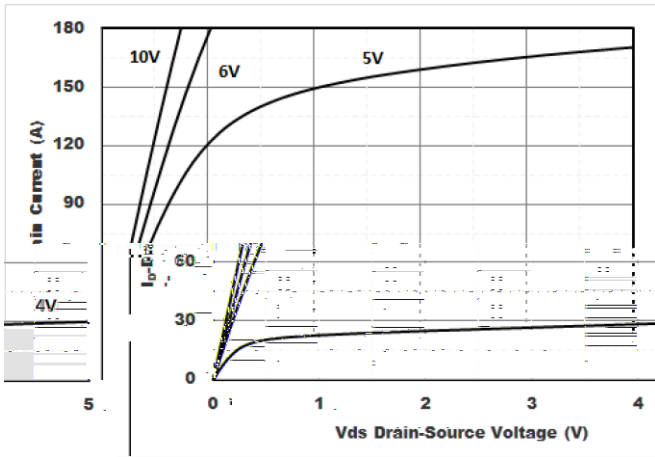


Figure1. Output Characteristics

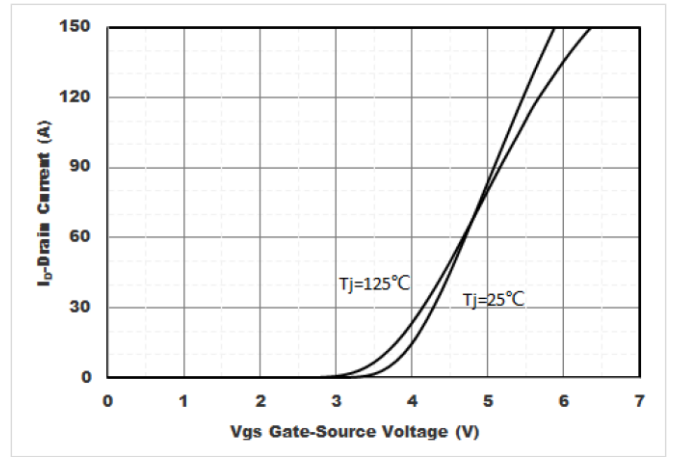


Figure2. Transfer Characteristics

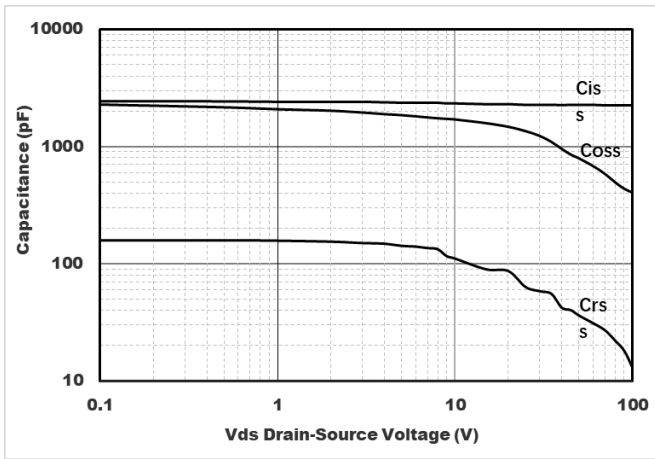


Figure3. Capacitance Characteristics

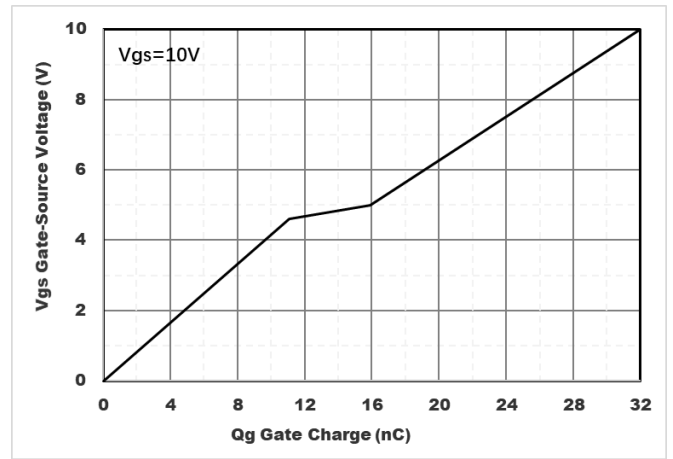


Figure4. Gate Charge

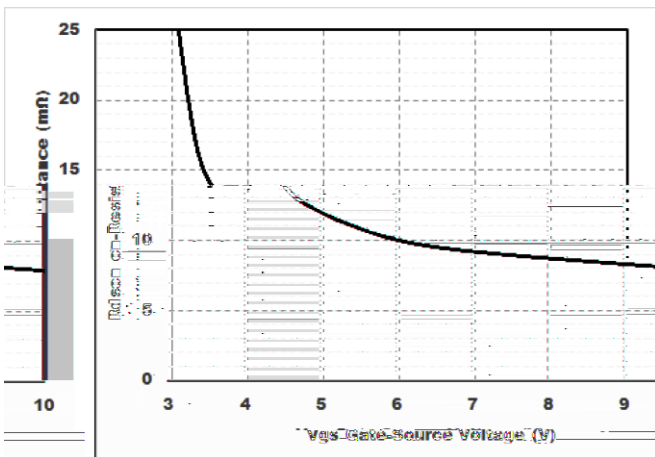


Figure5. : On-Resistance vs. Drain Current and Gate Voltage

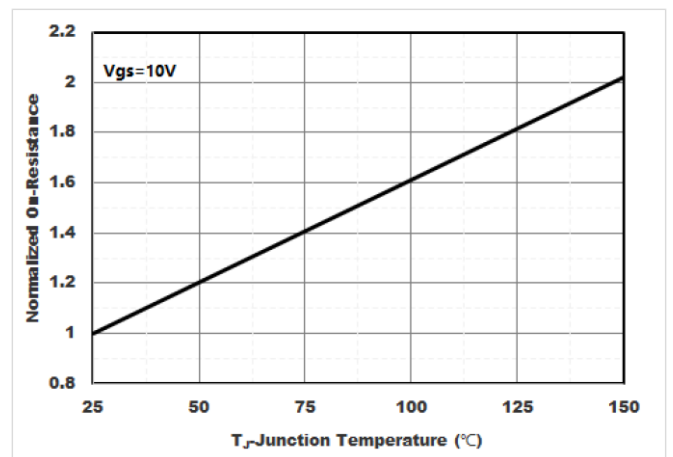


Figure6. Normalized On-Resistance



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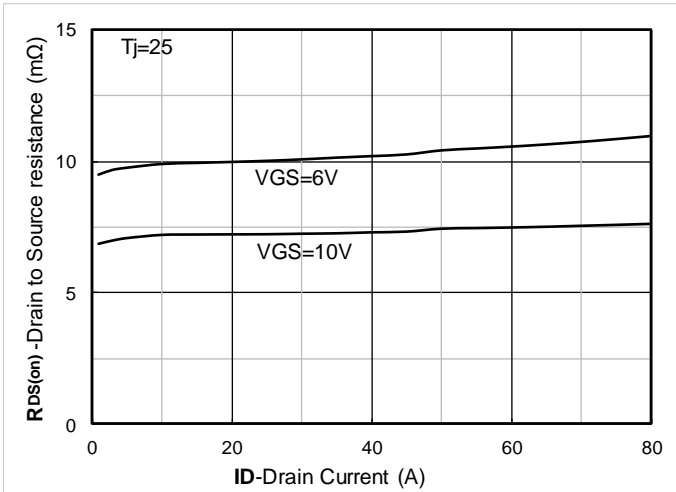


Figure 7. RDS(on) VS Drain Current

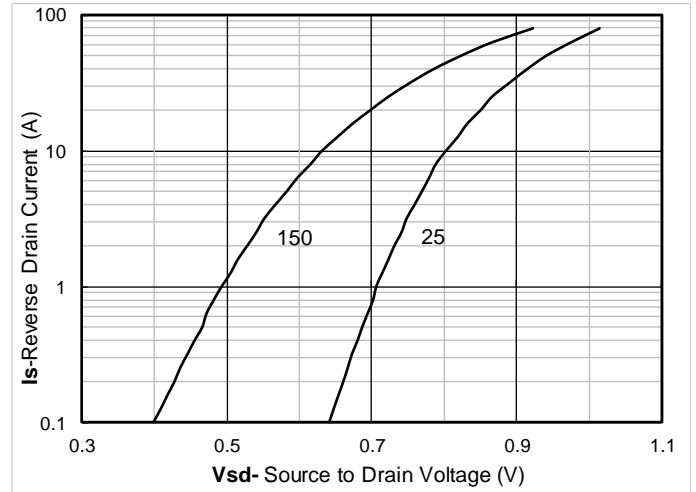


Figure 8. Forward characteristics of reverse diode

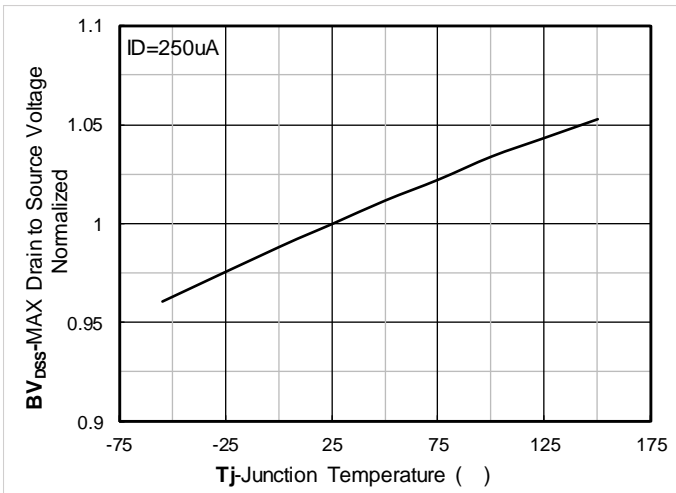


Figure 9. Normalized breakdown voltage

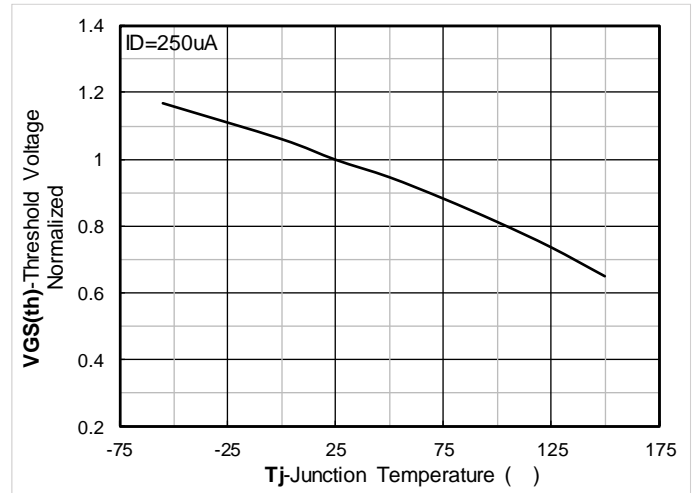


Figure 10. Normalized Threshold voltage

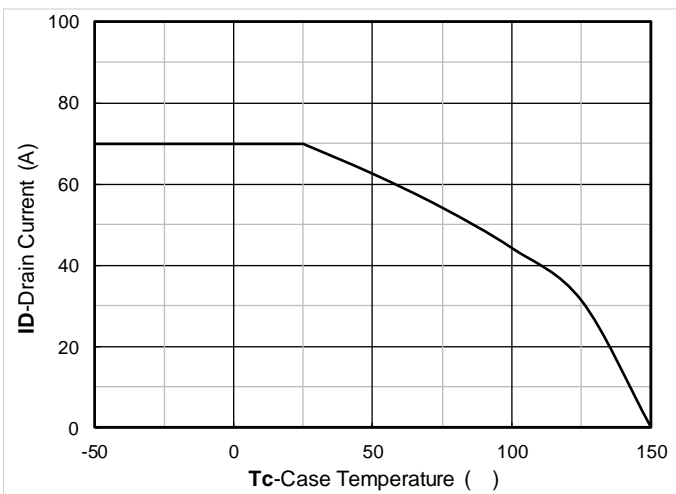


Figure 11. Current dissipation

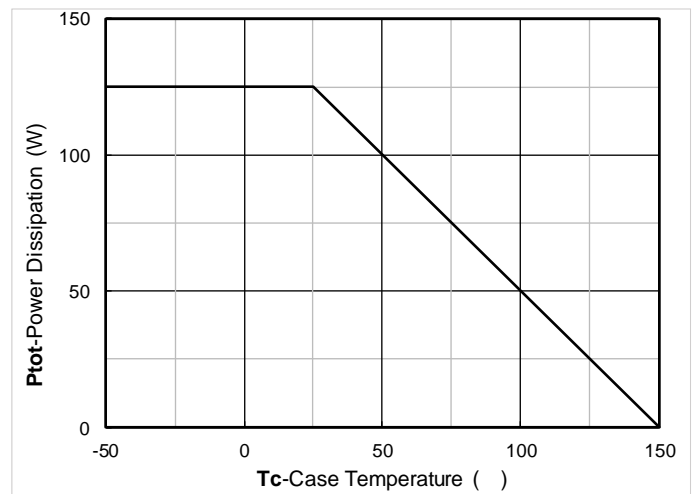


Figure 12. Power dissipation

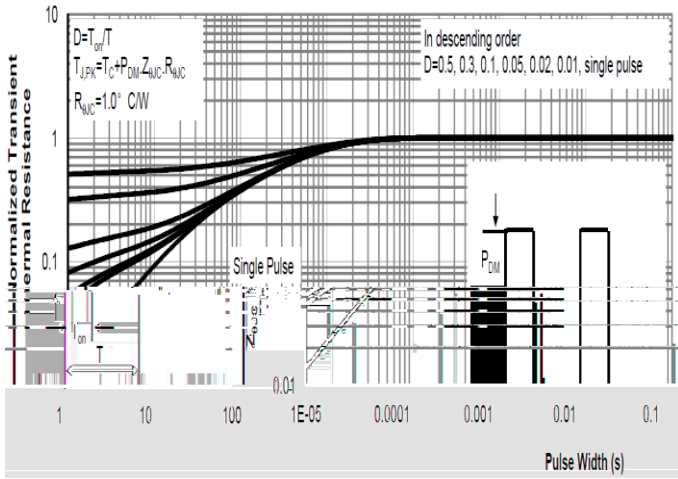


Figure 13. Normalized Maximum Transient thermal impedance

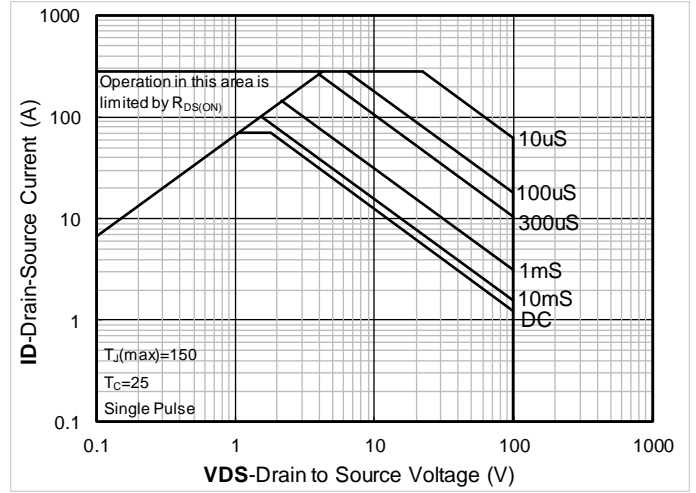
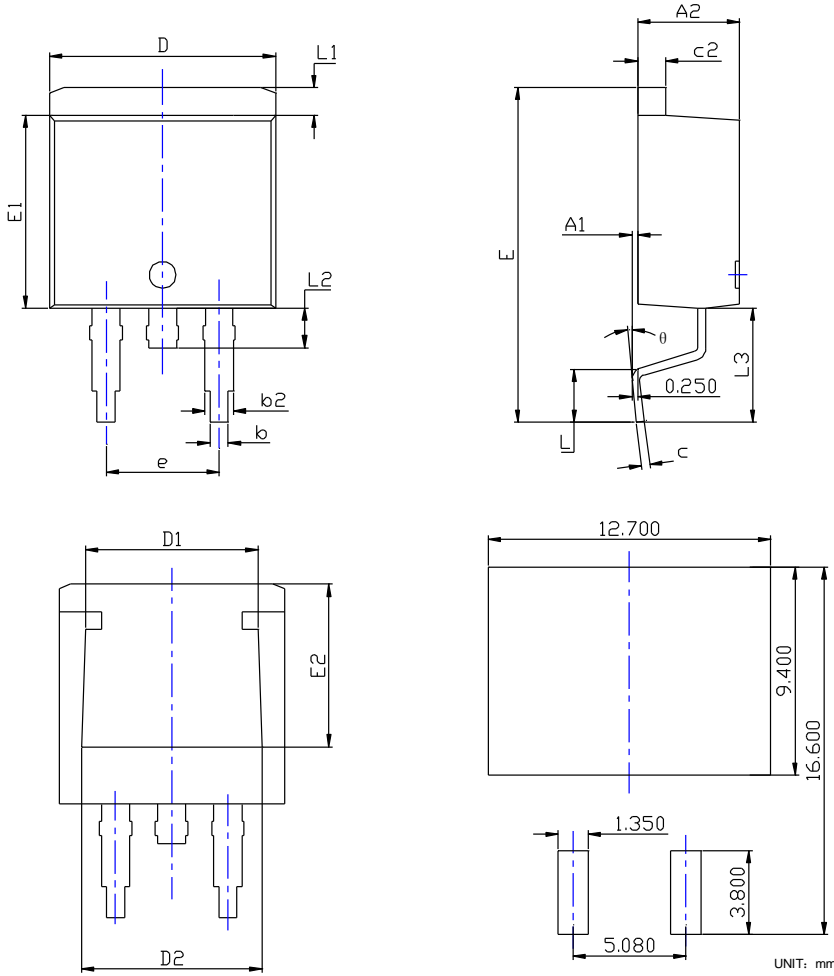


Figure 14. Safe Operation Area



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## TO-263-HY Package information



SYMBOL	DIMENSIONS					
	INCHES			Millimeter		
	MIN.	NDM.	MAX.	MIN.	NDM.	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.



## YJB70G10B

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