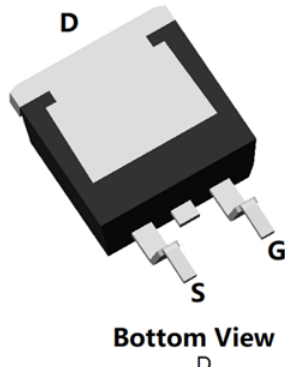
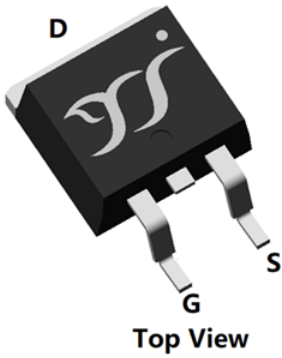
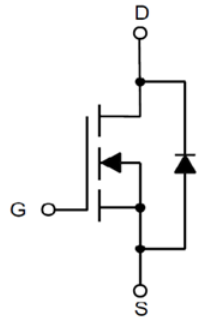


## N-Channel Enhancement Mode Field Effect Transistor



**TO-263**



### Product Summary

- $V_{DS}$  60V
- $I_D$  200A
- $R_{DS(ON)}$  ( at  $V_{GS}=10V$ ) <2.9 mohm
- $R_{DS(ON)}$  ( at  $V_{GS}=4.5V$ ) <3.9 mohm
- 100% EAS Tested
- 100%  $\nabla V_{DS}$  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
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

### Applications

- Consumer electronic power supply
- Isolated DC-DC Converters
- Motor control
- Invertors

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

Parameter		Symbol	Limit	Unit
Drain-source Voltage		$V_{DS}$	60	V
Gate-source Voltage		$V_{GS}$	$\pm 20$	V
Drain Current <sup>A</sup>	$T_C=25^\circ\text{C}$	$I_D$	200	A
	$T_C=100^\circ\text{C}$		125	
Pulsed Drain Current <sup>B</sup>		$I_{DM}$	600	A
Avalanche energy <sup>C</sup>		EAS	506	mJ
Total Power Dissipation <sup>D</sup>		$P_D$	260	W
Thermal Resistance Junction-to-Case		$R_{\theta JC}$	0.48	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction-to-Ambient <sup>E</sup>		$R_{\theta JA}$	28	
Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~+150	$^\circ\text{C}$

### ■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJB200G06C	F2	YJB200G06C	800	/	8000	13" reel



# YJB200G06C

## ■ Electrical Characteristics ( $T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$			1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.6	2.2	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		2.35	2.9	m $\Omega$
		$V_{GS}=4.5V, I_D=15A$		2.9	3.9	
Diode Forward Voltage	$V_{SD}$	$I_S=20A, V_{GS}=0V$			1.2	V
Maximum Body-Diode Continuous Current	$I_S$				200	A
<b>Dynamic Parameters</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, f=100KHZ$		5950		pF
Output Capacitance	$C_{oss}$			1250		
Reverse Transfer Capacitance	$C_{rss}$			85		
<b>Switching Parameters</b>						
Total Gate Charge	$Q_g$	$V_{GS}=10V, V_{DS}=50V, I_D=50A$		93		nC
Gate-Source Charge	$Q_{gs}$			17		
Gate-Drain Charge	$Q_{gd}$			14		
Reverse Recovery Charge	$Q_{rr}$	$I_f=25A, di/dt=100A/us$		73		ns
Reverse Recovery Time	$t_{rr}$			68		
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DD}=30V, I_D=25A$ $R_{GEN}=2\Omega$		22.5		ns
Turn-on Rise Time	$t_r$			6.7		
Turn-off Delay Time	$t_{d(off)}$			80.3		
Turn-off fall Time	$t_f$			26.9		

### Note:

- The maximum current rating is package limited.
- Repetitive rating; pulse width limited by max. junction temperature.
- $T_J=25^{\circ}\text{C}$ ,  $V_{DD}=80V$ ,  $V_G=10V$ ,  $R_G=25\Omega$ ,  $L=0.5mH$ ,  $I_{AS}=45A$ .
- $P_D$  is based on max. junction temperature, using junction-case thermal resistance.
- The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with  $T_a=25^{\circ}\text{C}$ .



## ■ Typical Performance Characteristics

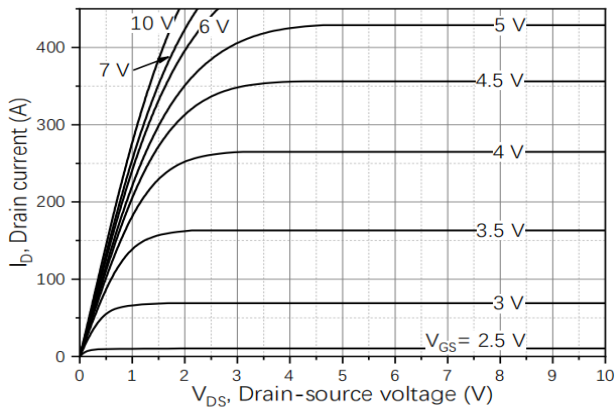


Figure1. Output Characteristics

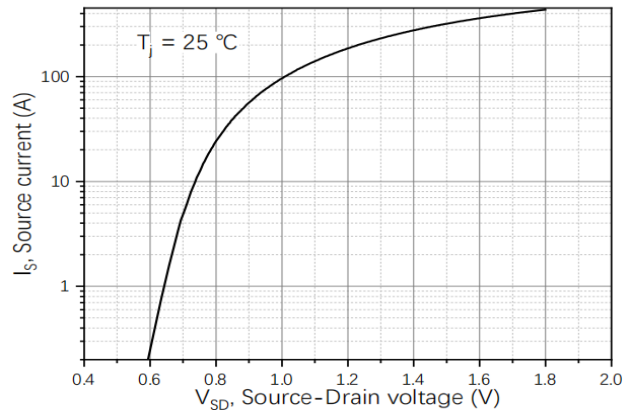


Figure2. Transfer Characteristics

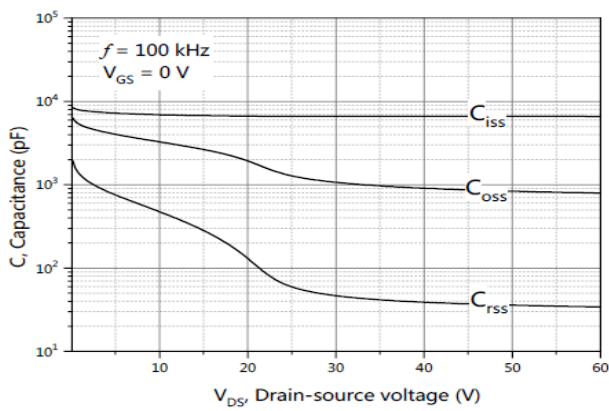


Figure3. Capacitance Characteristics

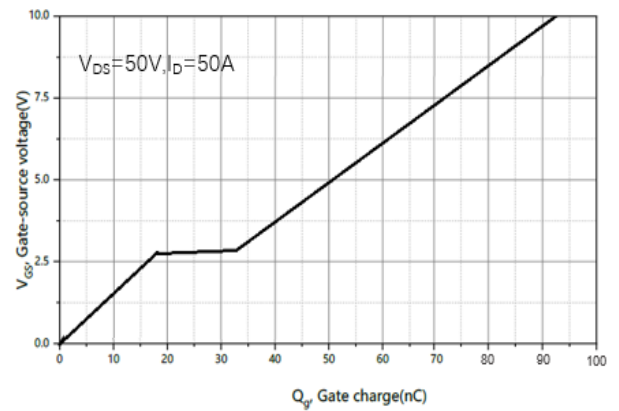


Figure4. Gate Charge

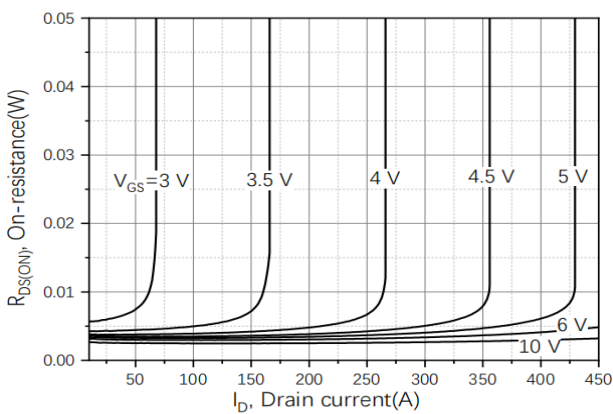


Figure5. Drain-Source on Resistance

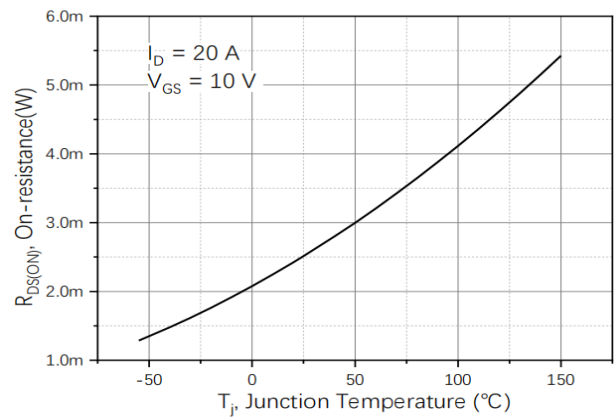


Figure6. Drain-Source on Resistance



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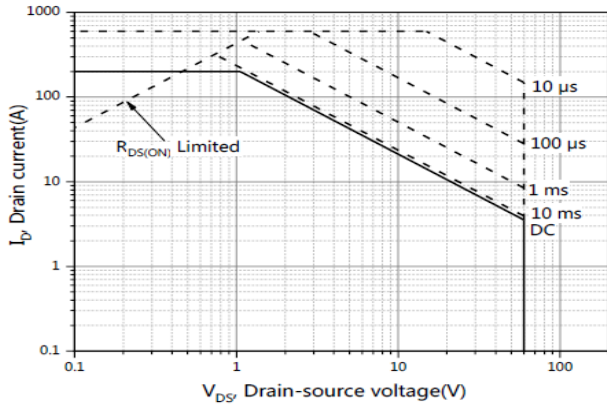


Figure 7. Safe Operation Area

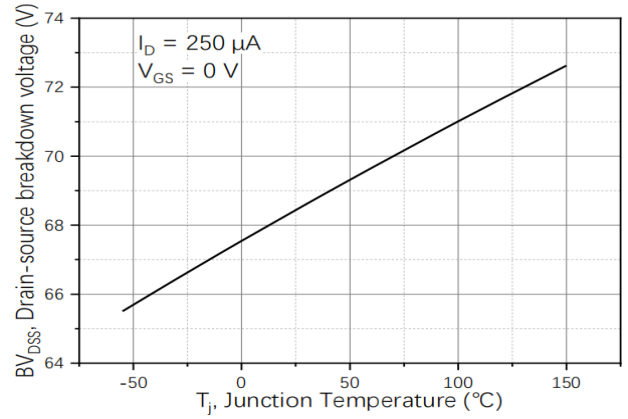


Figure 8. Drain-source breakdown voltage

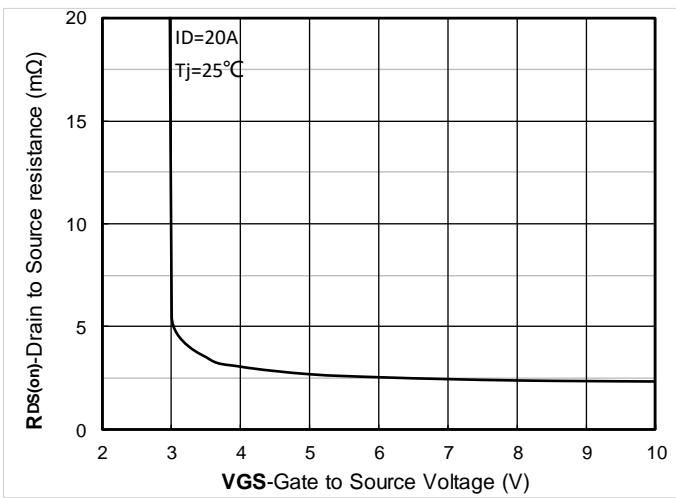


Figure 9. On-Resistance vs Gate to Source Voltage

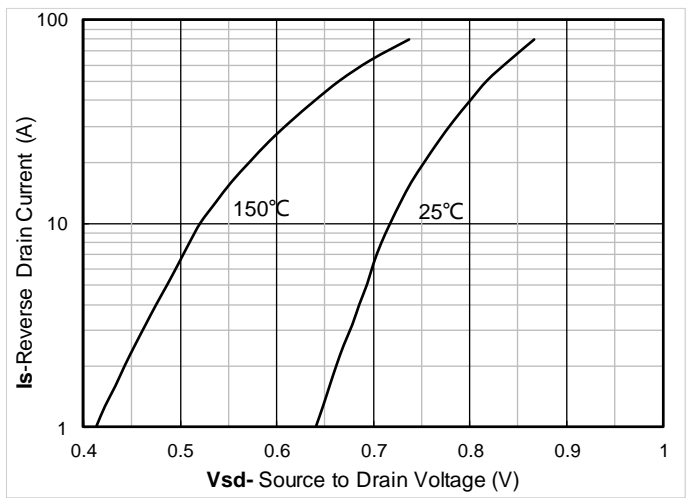


Figure 10. Forward characteristics of reverse diode

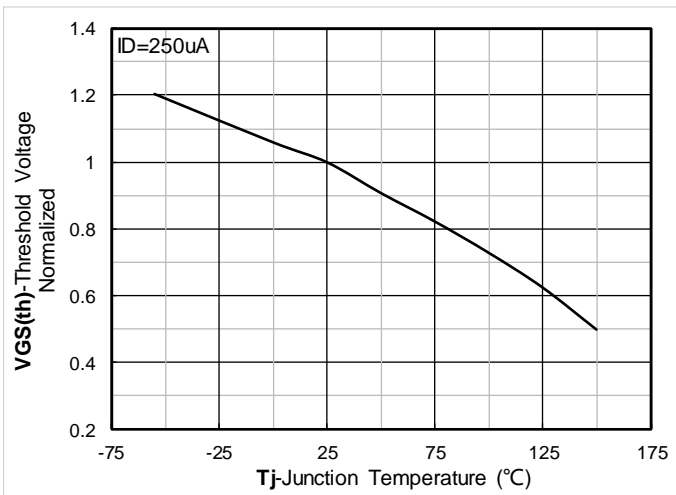


Figure 11. Normalized Threshold voltage

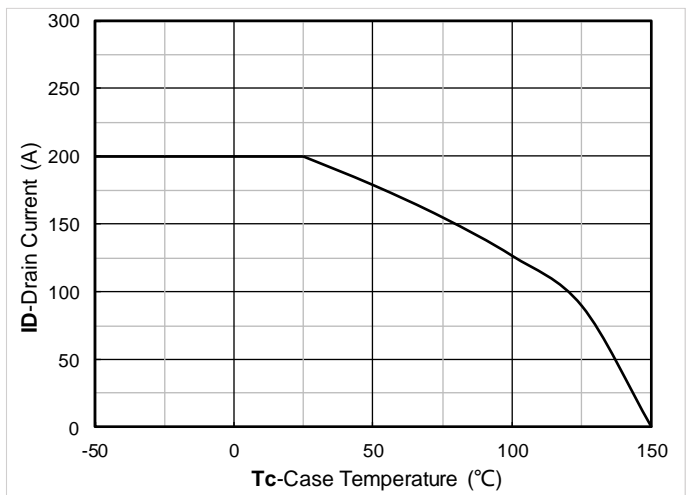


Figure 12. Current dissipation

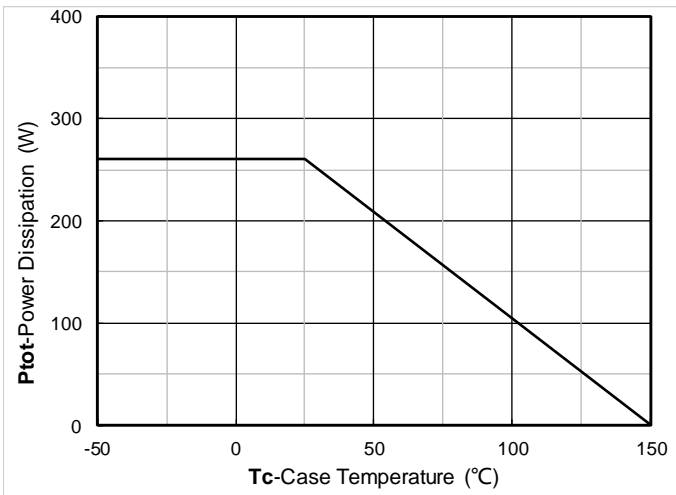


Figure13. Power dissipation

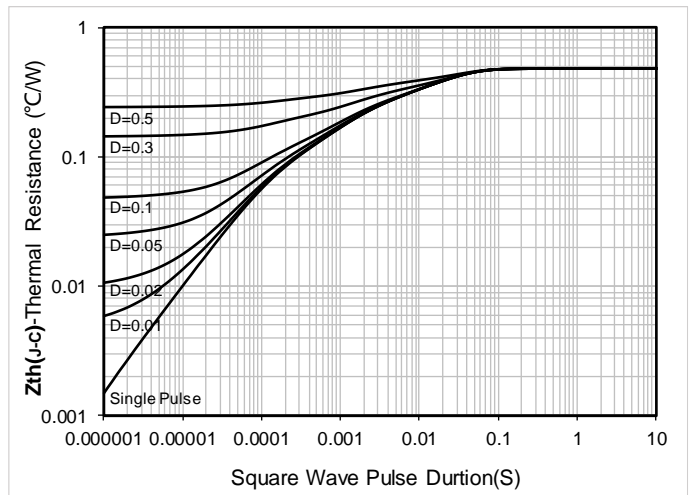


Figure14. Maximum Transient Thermal Impedance

## ■ Test circuits and waveforms

Figure A: Gate Charge Test Circuit & Waveforms

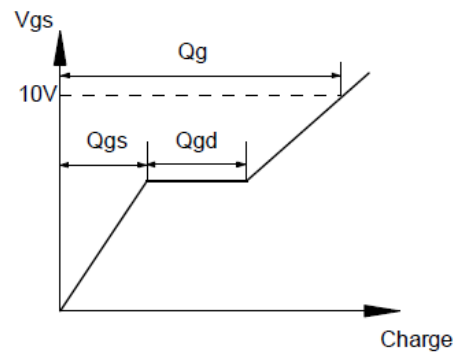
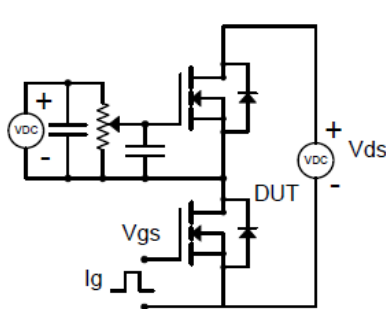


Figure B: Resistive Switching Test Circuit & Waveforms

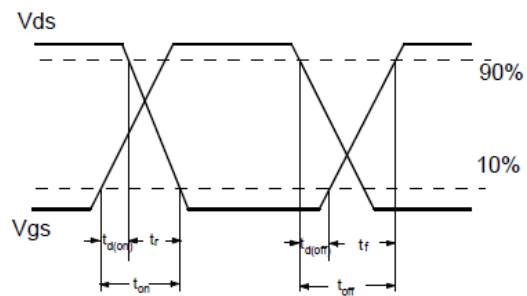
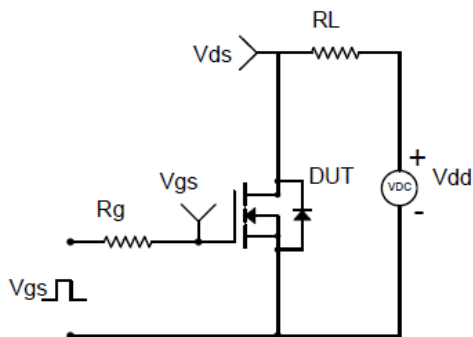


Figure C: Unclamped Inductive Switching (UIS) Test

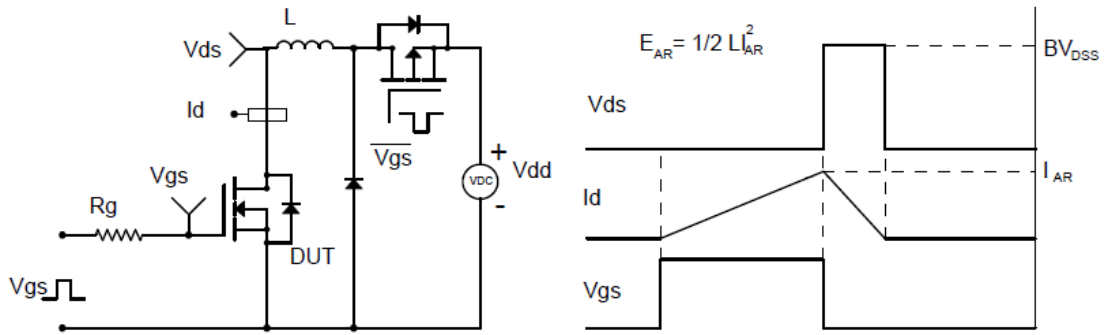
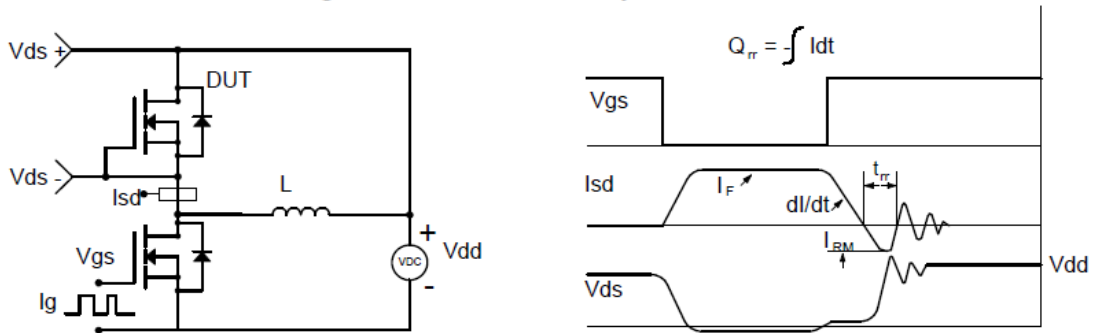


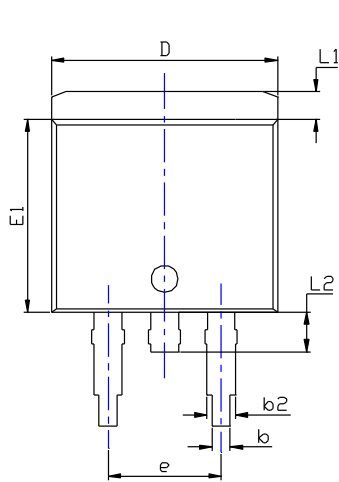
Figure D: Diode Recovery Test Circuit & Waveforms



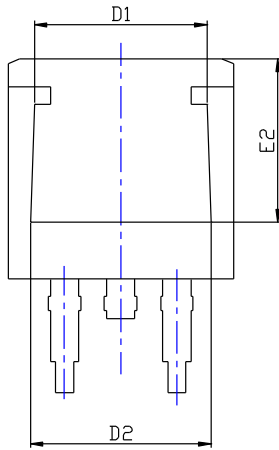


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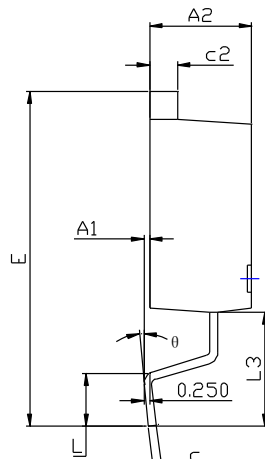
## ■ TO-263-HY Package information



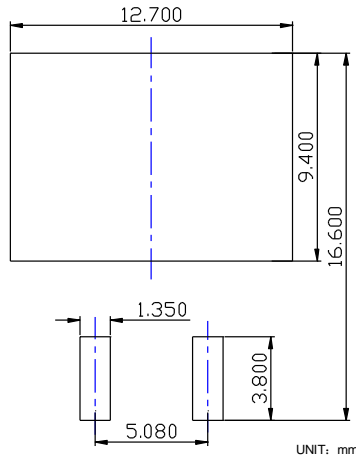
TOP VIEW



BOTTOM VIEW



SIDE VIEW



SUGGESTED SOLDER PAD LAYOUT

UNIT: mm

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.



## YJB200G06C

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