

**• General Description**

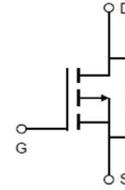
It combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ .

**• Features**

- Low  $R_{DS(ON)}$  to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance

**• Application**

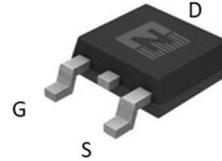
- BLDC Motor driver
- Load Switch
- DC-DC

**• Product Summary**


$V_{DS} = -60V$

$R_{DS(ON)} = 8m\Omega$

$I_D = -60A$



TO-252

**• Ordering Information:**

Part NO.	ZM080P06D
Marking	ZM080P06
Packing Information	REEL TAPE
Basic ordering unit (pcs)	2500

**• Absolute Maximum Ratings ( $T_C = 25^\circ C$ )**

Parameter	Symbol	Conditions	Rating	Unit
Drain-Source Voltage	$V_{DS}$	$25^\circ C \leq T_J \leq 150^\circ C$	-60	V
Gate-Source Voltage	$V_{GS}$	Pulsed <sup>①</sup>	+20/-20	V
Continuous Drain Current	$I_D$	$T_C = 25^\circ C$	-60	A
	$I_D$	$T_C = 75^\circ C$	-45	A
	$I_D$	$T_C = 100^\circ C$	-38	A
Pulsed Drain Current	$I_{DM}$	pulsed; $t_p \leq 10 \mu s$ ; $T_{mb} = 25^\circ C$ ;	-180	A
Total Power Dissipation	$P_D$	$T_C = 25^\circ C$	62.5	W
Total Power Dissipation	$P_D$	$T_A = 25^\circ C$	2.5	W
Operating Junction Temperature	$T_J$		-55 to 150	$^\circ C$
Storage Temperature	$T_{STG}$		-55 to 150	$^\circ C$
Single Pulse Avalanche Energy	$E_{AS}$	$L = 0.1mH$ , $V_{GS} = 10V$ , $R_g = 25\Omega$ , $T_J = 25^\circ C$	210	mJ
ESD Level (HBM)			Class 2	

**•Thermal resistance**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	$R_{thJC}$	-	-	2.0	$^{\circ}C/W$
Thermal resistance, junction - ambient <sup>®</sup>	$R_{thJA}$	-	-	50	$^{\circ}C/W$
Soldering temperature	$T_{sold}$	-	-	260	$^{\circ}C$

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-60			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.3	-1.8	-2.5	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-60V, V_{GS}=0V$			-1.0	$\mu A$
Gate- Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-20A$		8	10.5	$m\Omega$
		$V_{GS}=-4.5V, I_D=-16A^{\circ}$		10	14	$m\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=-10V, I_D=-10A$		32		s
Source-drain voltage	$V_{SD}$	$I_S=-20A$			1.28	V

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Gate Resistance	$R_g$	$f = 1MHz$	-	3.1	-	$\Omega$
Input capacitance	$C_{iss}$	$f = 1MHz$ $V_{DS}=-25V$	-	10440	-	pF
Output capacitance	$C_{oss}$		-	412	-	
Reverse transfer capacitance	$C_{rss}$		-	325	-	

**•Gate Charge characteristics( $T_a = 25^{\circ}C$ )**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	$Q_g$	$V_{DD}=-25V$	-	158	-	nC
Gate - Source charge	$Q_{gs}$	$I_D=-10A$	-	26	-	
Gate - Drain charge	$Q_{gd}$	$V_{GS}=-10V$	-	27	-	

Fig.1 Gate-Charge Characteristics

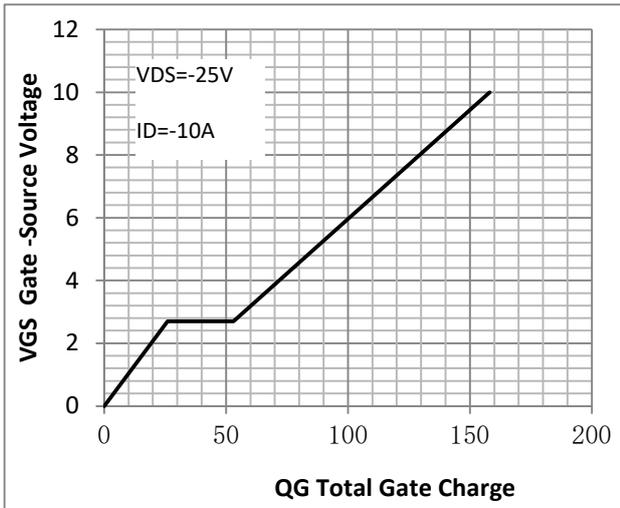


Fig.2 Capacitance Characteristics

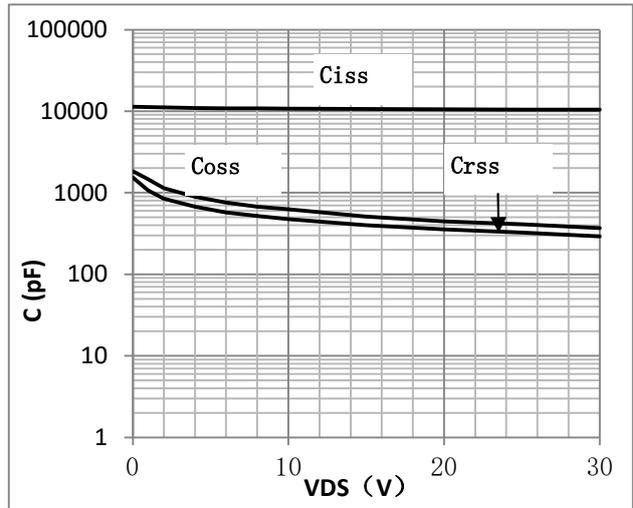


Fig.3 Power Dissipation

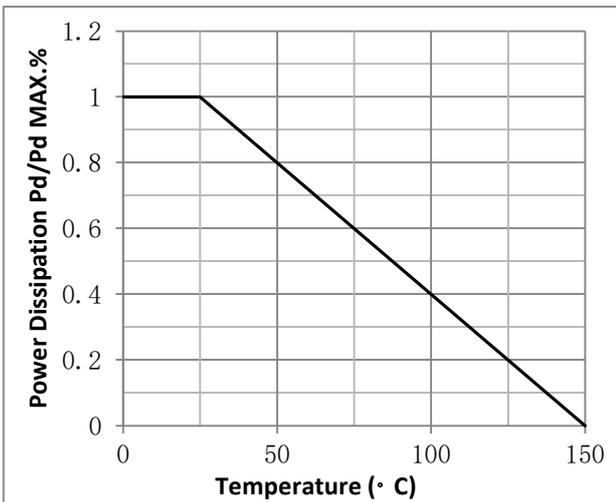


Fig.4 Typical output Characteristics

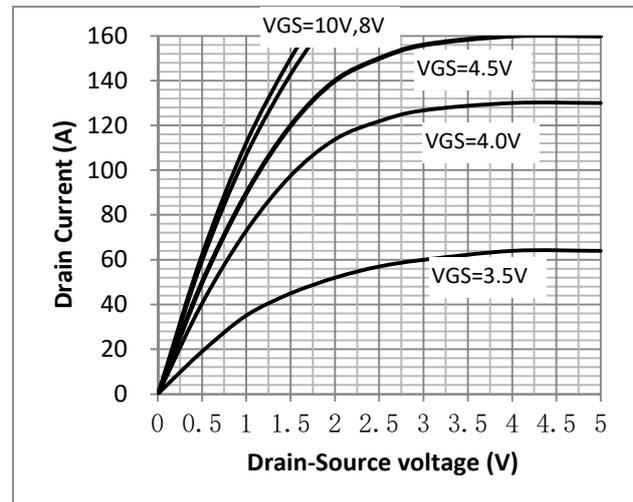


Fig.5 Threshold Voltage V.S Junction Temperature

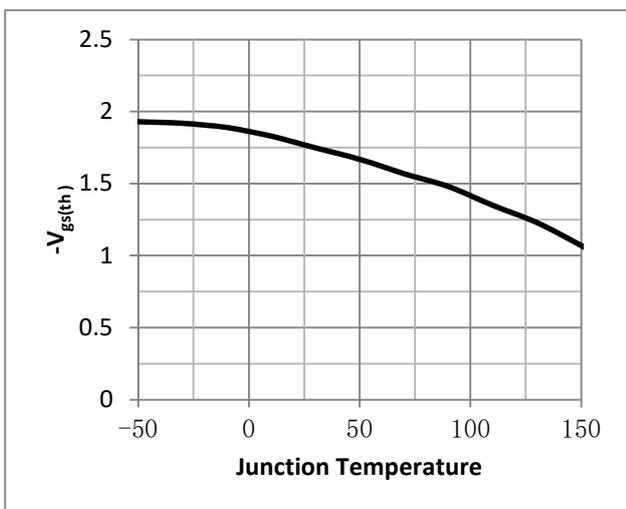


Fig.6 Resistance V.S Drain Current

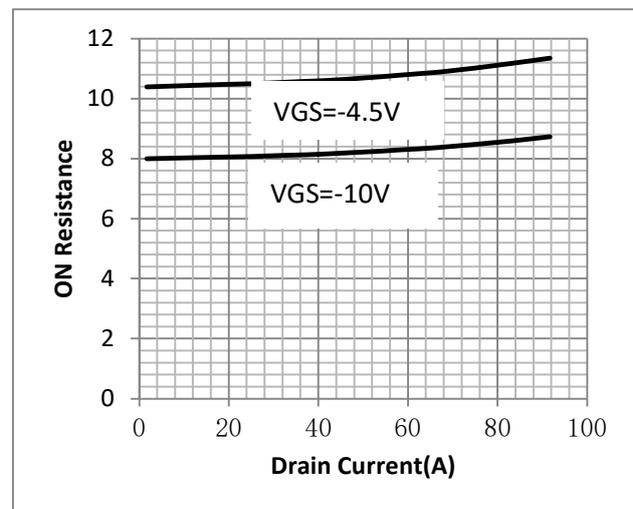


Fig.7 On-Resistance VS Gate Source Voltage

Fig.8 On-Resistance V.S Junction Temperature

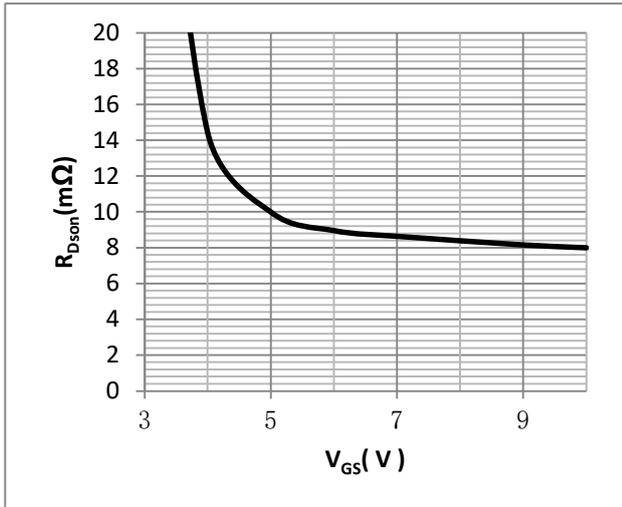


Figure.9 Transfer Characteristics

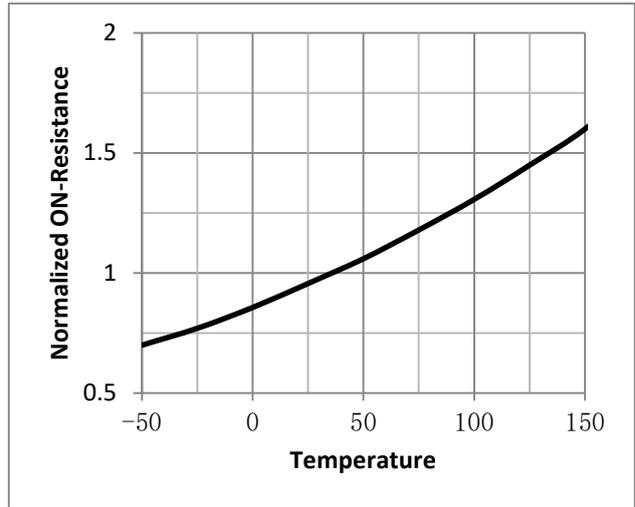


Figure.10 Diode Forward Voltage vs. Current

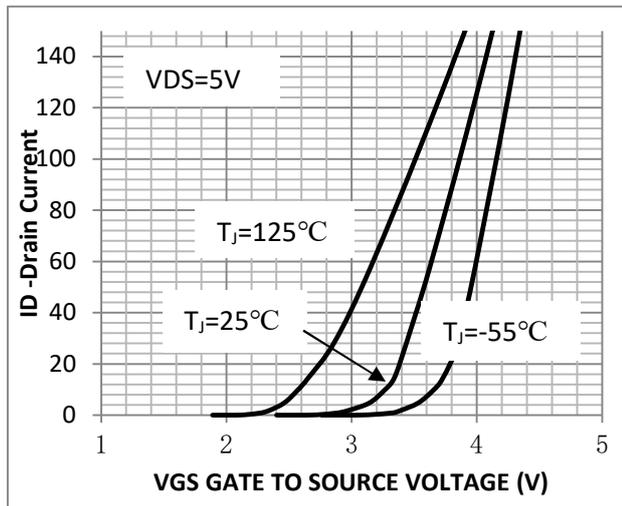


Fig.11 SOA Maximum Safe Operating Area

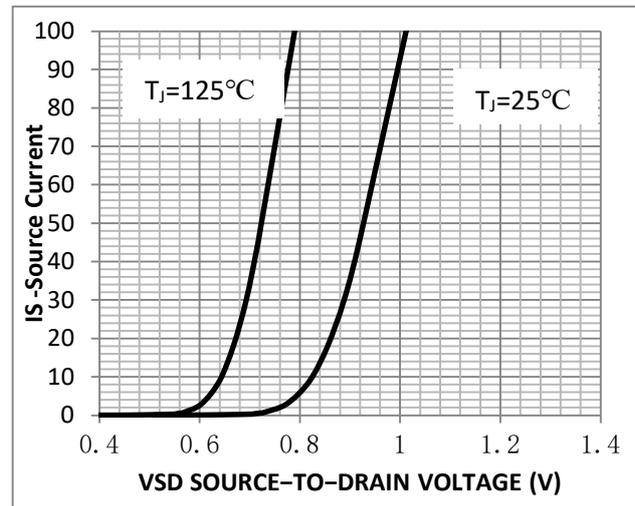


Fig.12  $I_D$ -Junction Temperature

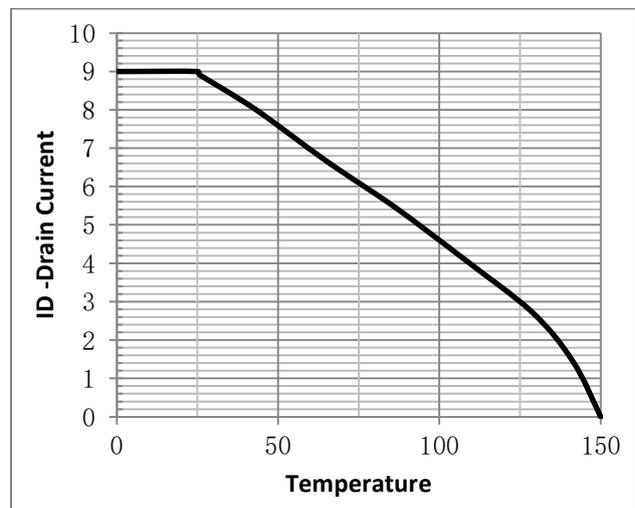
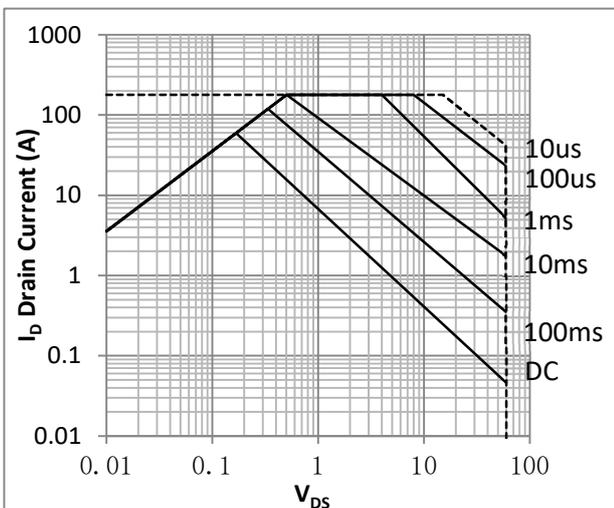


Fig.13 Gate Charge Measurement Circuit

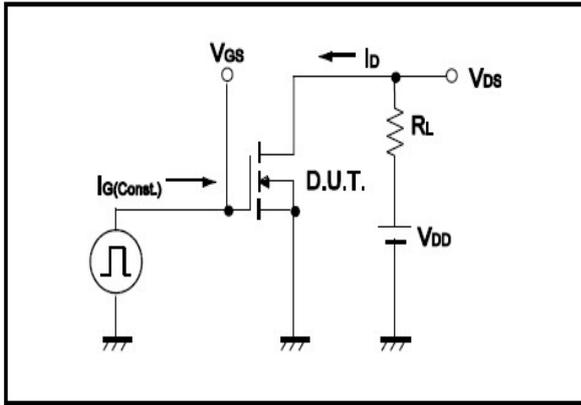


Fig.14 Gate Charge Waveform

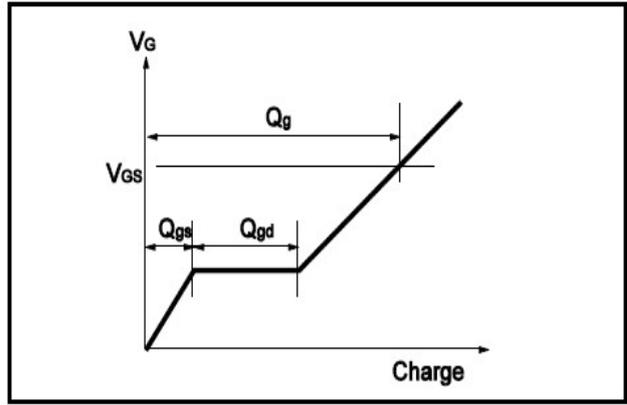


Fig.15 Switching Time Measurement Circuit

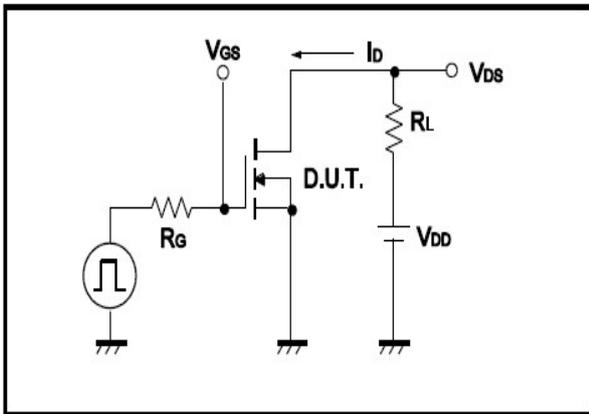


Fig.16 Switching Time Waveform

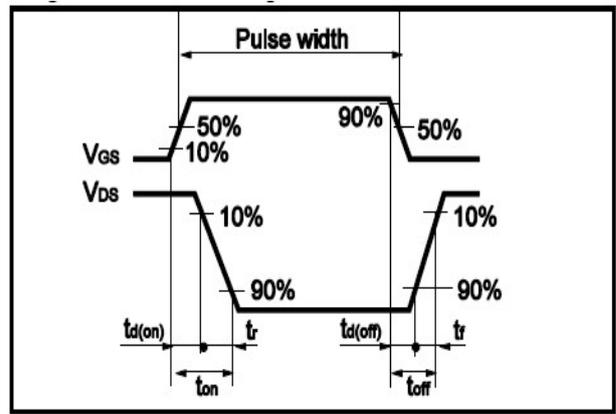


Fig.17 Avalanche Measurement Circuit

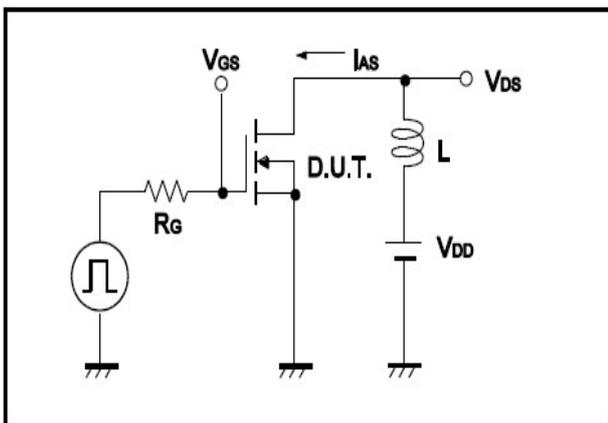
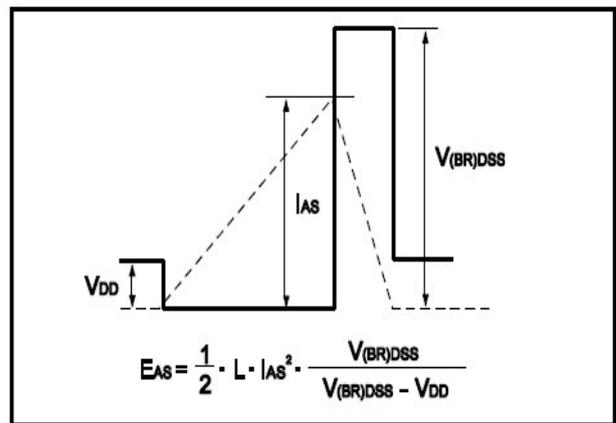
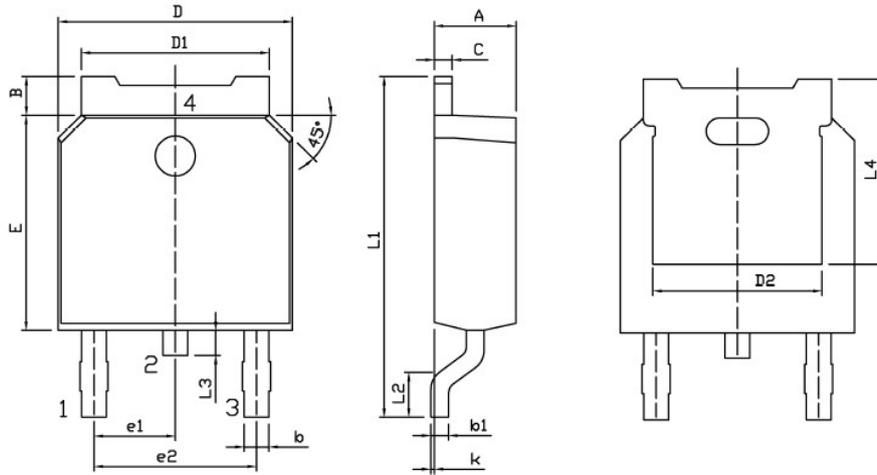


Fig.18 Avalanche Waveform



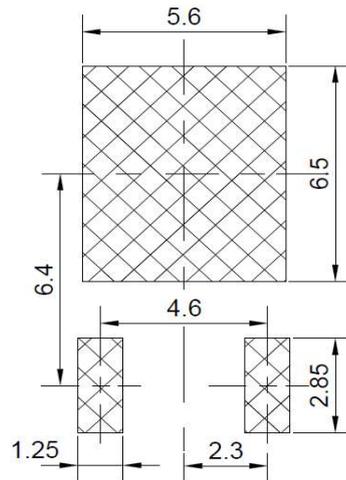


• Dimensions (TO-252)



Land Pattern  
(Only for Reference)

Dimensions In Millimeters					
Symbol	MIN	MAX	Symbol	MIN	MAX
A	2.20	2.40	E	5.95	6.25
B	0.95	1.25	e1	2.24	2.34
b	0.70	0.90	e2	4.43	4.73
b1	0.45	0.55	L1	9.85	10.35
C	0.45	0.55	L2	1.70	2.00
D	6.45	6.75	L3	0.60	0.90
D1	5.10	5.50	L4	5.05	
D2	4.85		k	0.00	0.10



Note: ① Pulse Test: Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ , Accumulation time  $\leq 50$  hours;

② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate;

③  $V_{gs} \geq 4.5V$  is required for practical application.



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