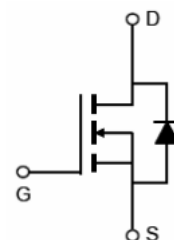


**Main Product Characteristics:**

$V_{DSS}$	60V
$R_{DS(on)}$	5.8m $\Omega$ (typ.)
$I_D$	80A


**TO-263 (D2PAK)**

**Marking and Pin Assignment**

**Schematic Diagram**
**Features and Benefits:**

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature


**Description:**

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

**Absolute Max Rating:**

Symbol	Parameter	Max.	Units
$I_D @ TC = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$ ①	80	A
$I_{DM}$	Pulsed Drain Current ②	320	
$P_D @ TC = 25^\circ C$	Power Dissipation ③	108	W
$V_{DS}$	Drain-Source Voltage	60	V
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$E_{AS}$	Single Pulse Avalanche Energy @ $L=0.5mH$	410	mJ
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ C$

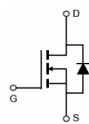
## Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	1.4	$^{\circ}C/W$

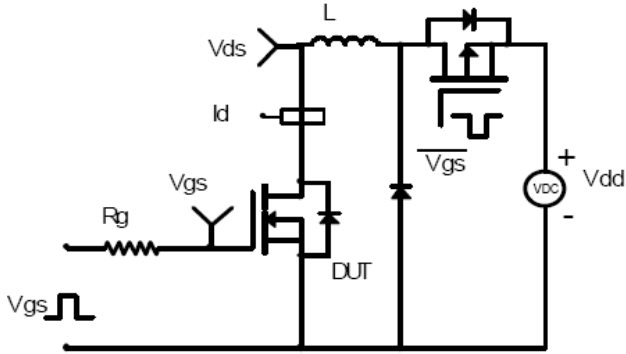
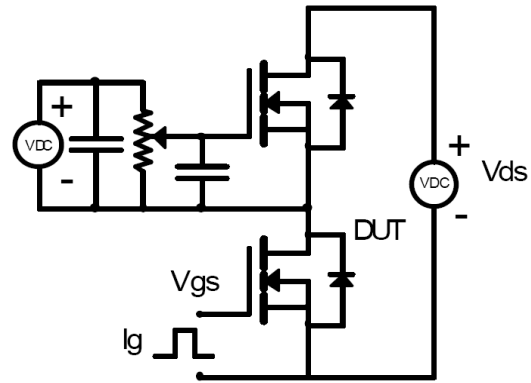
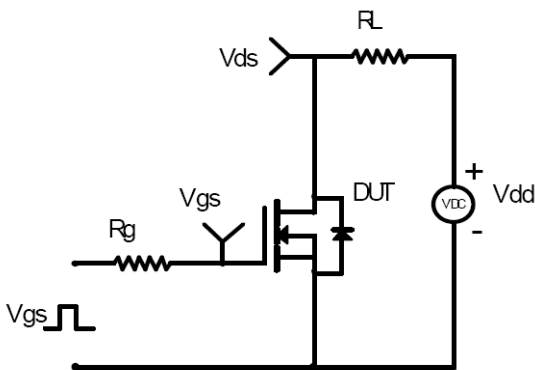
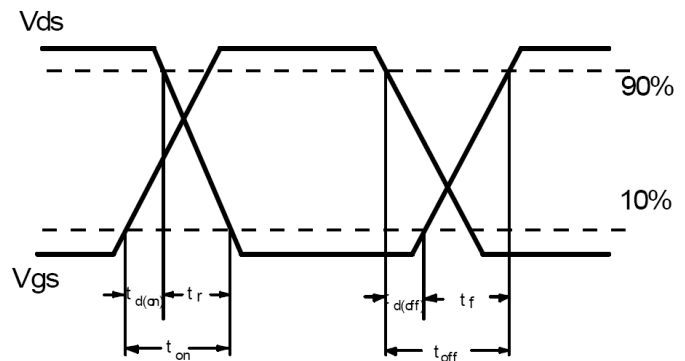
## Electrical Characterizes @ $T_A=25^{\circ}C$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	60	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	5.8	7	m $\Omega$	$V_{GS}=10V, I_D=30A$
$V_{GS(th)}$	Gate threshold voltage	2	—	4	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
$I_{DSS}$	Drain-to-Source leakage current	—	—	1	$\mu A$	$V_{DS} = 60V, V_{GS} = 0V$
$I_{GSS}$	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 20V$
		—	—	-100		$V_{GS} = -20V$
$Q_g$	Total gate charge	—	71.2	—	nC	$I_D = 30A,$ $V_{DS}=30V,$ $V_{GS} = 15V$
$Q_{gs}$	Gate-to-Source charge	—	16.4	—		
$Q_{gd}$	Gate-to-Drain("Miller") charge	—	23.3	—		
$t_{d(on)}$	Turn-on delay time	—	18.8	—	ns	$V_{GS}=10V, V_{DS}=30V,$ $R_{GEN}=3\Omega$ $I_D = 30A$
$t_r$	Rise time	—	11.8	—		
$t_{d(off)}$	Turn-Off delay time	—	107.3	—		
$t_f$	Fall time	—	58.4	—		
$C_{iss}$	Input capacitance	—	3934	—	pF	$V_{GS} = 0V$ $V_{DS} = 50V$ $f = 1MHz$
$C_{oss}$	Output capacitance	—	209	—		
$C_{rss}$	Reverse transfer capacitance	—	191	—		

## Source-Drain Ratings and Characteristics

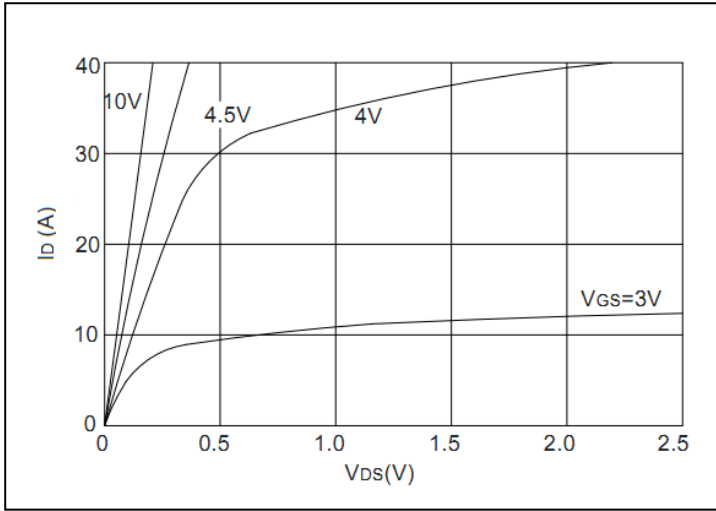
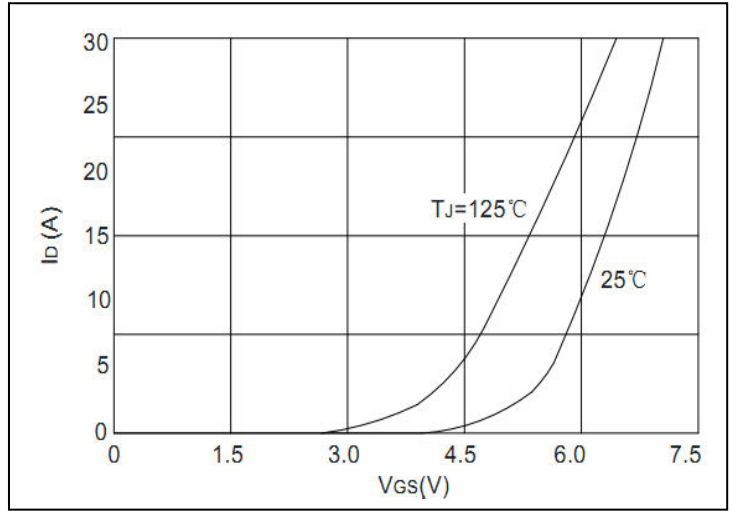
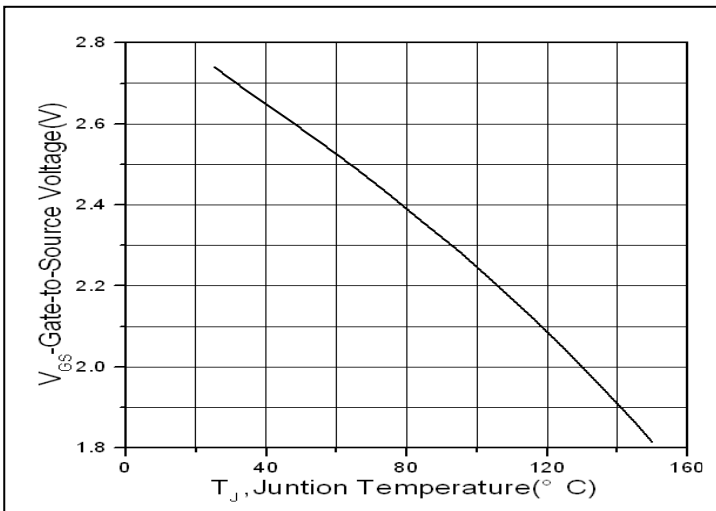
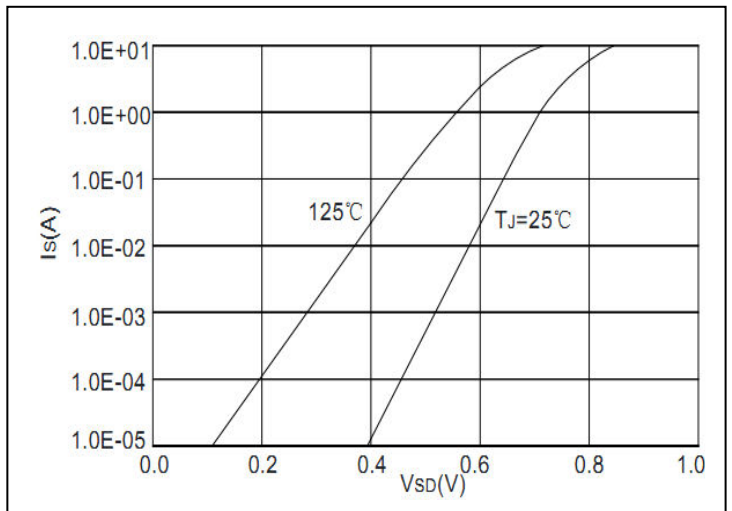
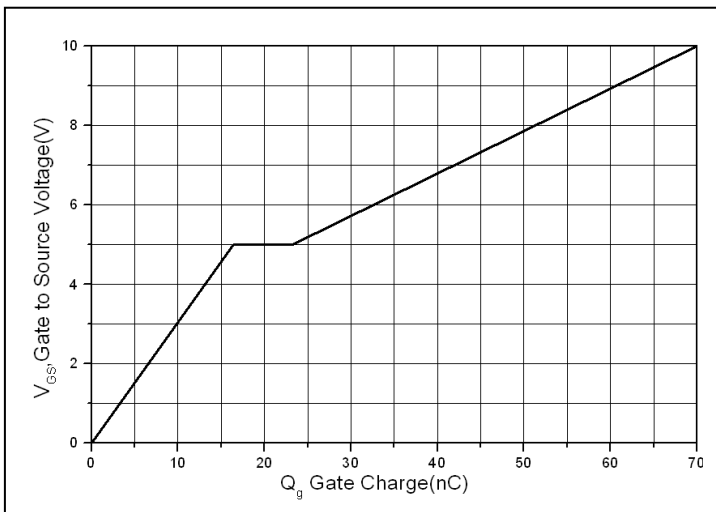
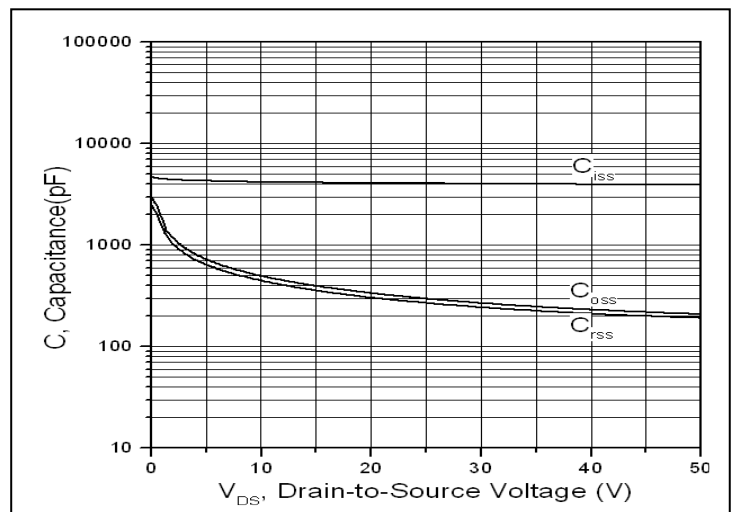
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$I_S$	Continuous Source Current (Body Diode)	—	—	80	A	MOSFET symbol showing the integral reverse p-n junction diode. 
$I_{SM}$	Pulsed Source Current (Body Diode)	—	—	320	A	
$V_{SD}$	Diode Forward Voltage	—	0.89	1.2	V	$I_S=30A, V_{GS}=0V$
$t_{rr}$	Reverse Recovery Time	—	31.4	—	ns	$I_S=30A, di/dt=100A/us$
$Q_{rr}$	Reverse Recovery Charge	—	31.1	—	nC	

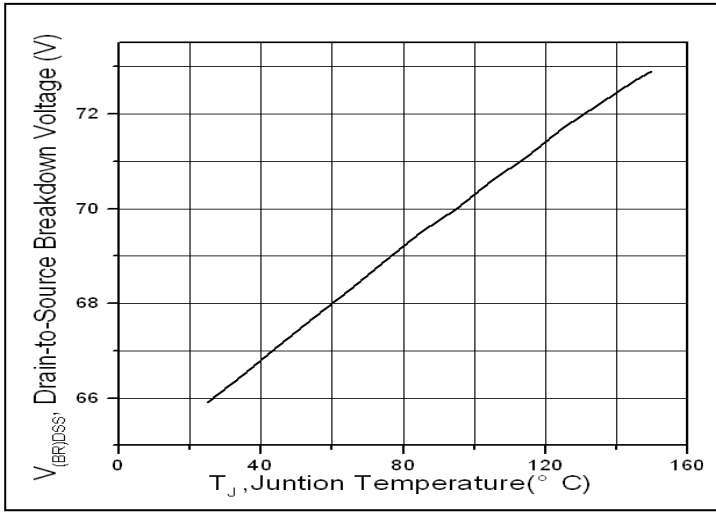
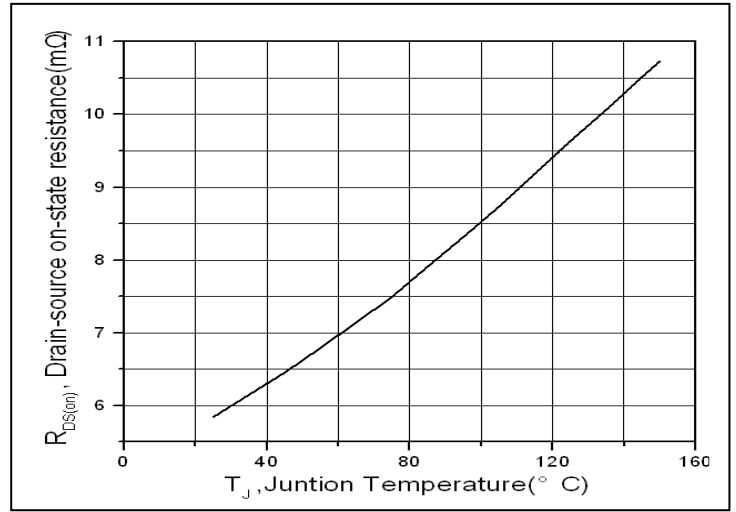
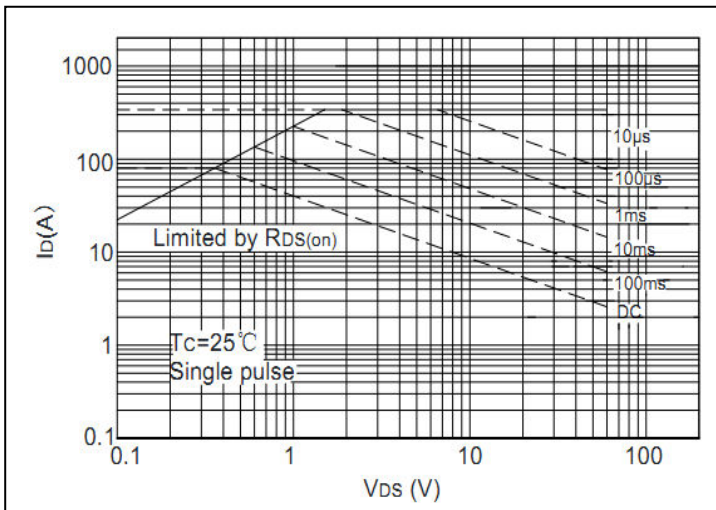
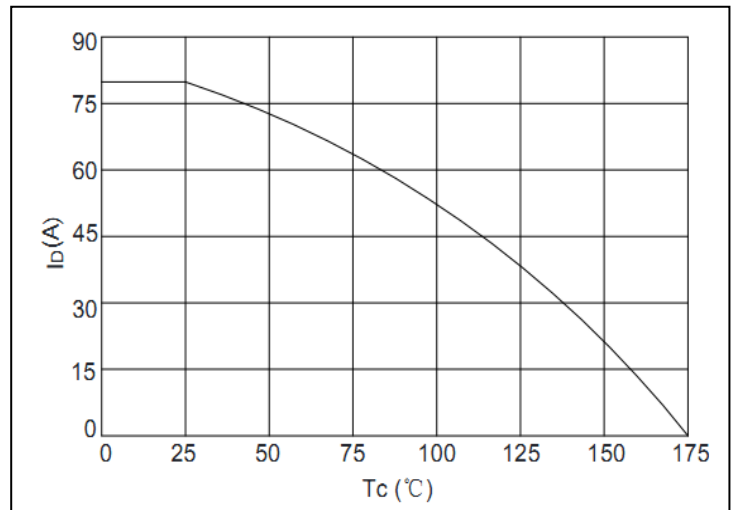
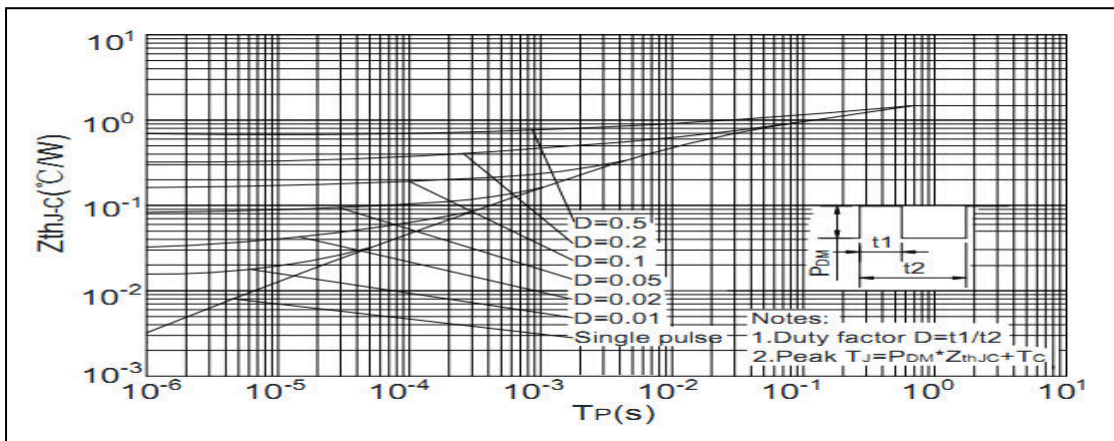
## Test Circuits and Waveforms

**EAS Test Circuit:**

**Gate Charge Test Circuit:**

**Switching Time Test Circuit:**

**Switching Waveforms:**


### Notes:

- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.

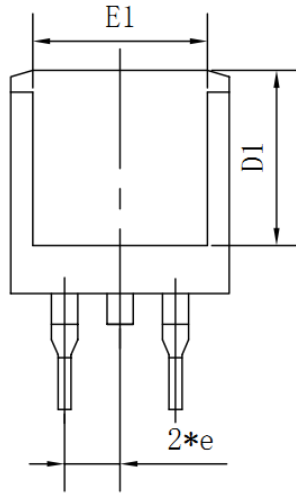
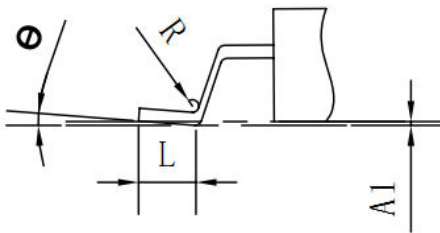
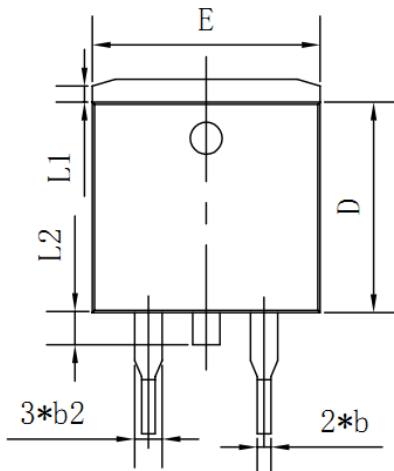
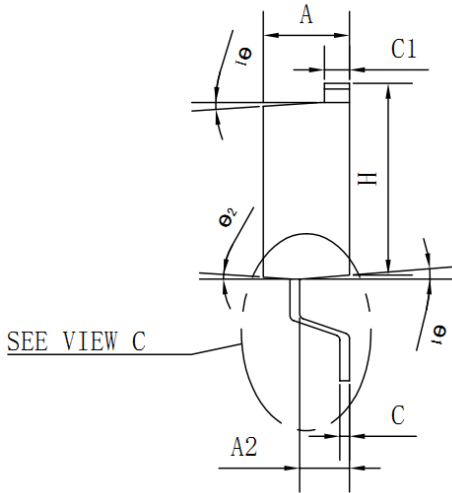
**Typical Electrical and Thermal Characteristics**

**Figure1. Typical Output Characteristics**

**Figure2. Transfer Characteristics**

**Figure 3. Gate to Source Cut-off Voltage**

**Figure 4. Body Diode Characteristics**

**Figure5. Gate Charge**

**Figure6. Capacitance**

**Typical Electrical and Thermal Characteristics**

**Figure7. Drain-to-Source Breakdown Voltage vs. Temperature**

**Figure8. Normalized On-Resistance vs. Junction Temperature**

**Figure9. Safe Operating Area**

**Figure10. Drain Current vs. Case Temperature**

**Figure11. Normalized Maximum Transient Thermal Impedance**

**Mechanical Data:**

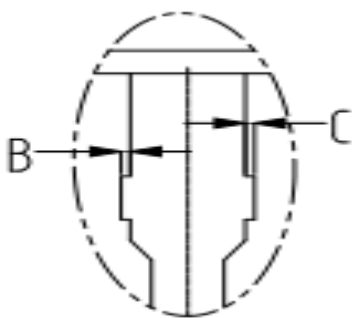
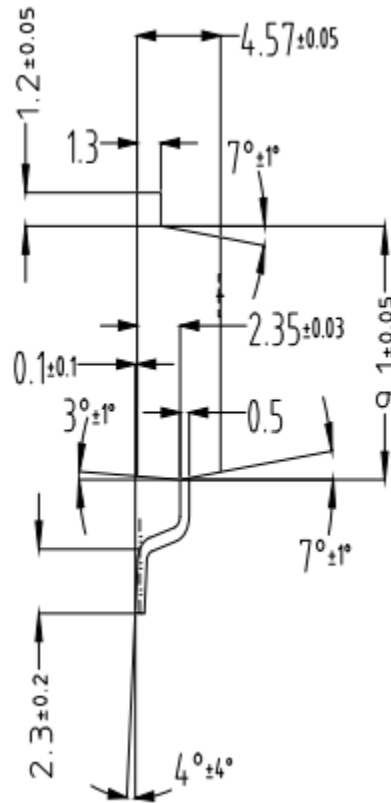
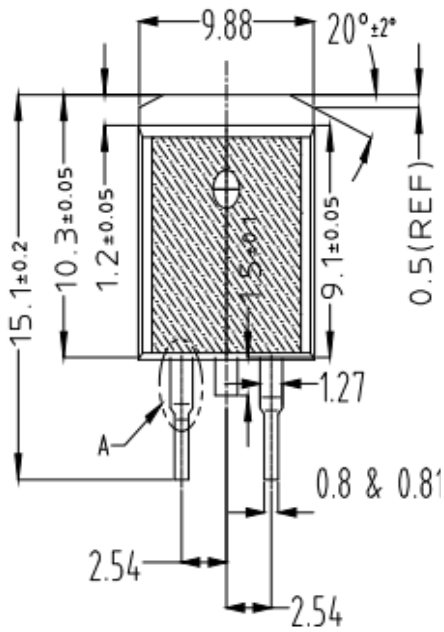
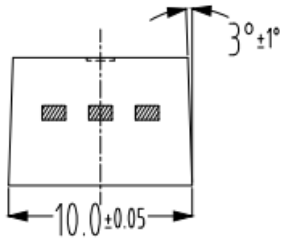
TO-263 Package Outline (Unit:mm)

Option 1

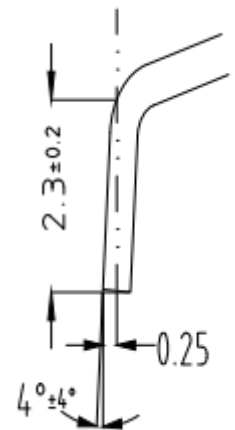


SYMBOL	MIN	NOM	MAX
A	4.35	4.47	4.60
A1	0.09	0.10	0.11
A2	2.30	2.40	2.50
b	0.70	0.80	1.00
b2	1.25	1.36	1.38
C	0.45	0.50	0.55
C1	1.29	1.30	1.31
D	9.10	9.20	9.30
D1	7.90	8.00	8.10
E	9.85	10.00	10.20
E1	7.90	8.00	8.10
H	15.30	15.50	15.70
e	-	2.54	-
L	2.34	2.54	2.74
L1	1.00	1.10	1.20
L2	1.30	1.40	1.50
R	0.24	0.25	0.26
$\theta$	0°	4°	8°
$\theta_1$	4°	7°	10°
$\theta_2$	0°	3°	6°

Option 2



$0 < B, C < 0.076$   
 DETAIL "A"



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**Suzhou Silikron Semiconductor Corp.**

506 , NW-01,Nanopolis, 99th Jinjihu Avenue ,Industrial Park ,Suzhou ,P.R, CHINA

TEL: (86-512) 62560688

FAX: (86-512) 62560688-8092

E-mail: Sales@silikron.com