



Features

- Wide bandgap SiC MOSFET technology
- Built SiC SBD
- Low On-Resistance with High Blocking Voltage
- Low Capacitances with High-Speed switching
- Low reverse recovery(Qrr)
- Halogen free, RoHS compliant

Benefits

- Reduce switching losses
- Increased system Switching Frequency
- Increased power density
- Reduction of heat sink requirements

Applications

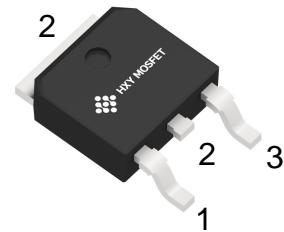
- Switch mode power supplies
- Renewable energy
- On Board Charger
- High Voltage DC/DC Converters



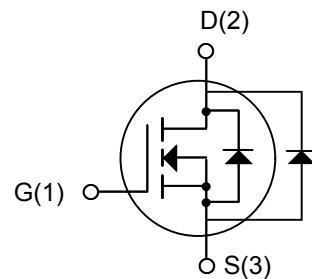
Ordering Part Number	Package	Brand
SIHD6N65ET1-GE3	TO-252-2L	HXY MOSFET

Maximum Ratings ($T_c = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Value	Unit	Note
V_{DSmax}	Drain-Source Voltage	$V_{GS} = 0\text{V}$, $I_D = 100\mu\text{A}$	800	V	
V_{GS}	Gate-Source voltage (transient)	$t_p \leq 500\text{ns}$, duty cycle $\leq 1\%$	-8/+20	V	
V_{GSop}	Recommend Gate-Source Voltage	Static	-4/+18	V	
EAS	Single pulse avalanche energy	$V_{DS}=800\text{V}$, $V_{DD}=50\text{V}$, $V_{GS}=15\text{V}$, $L=1\text{mH}$, $T_c=25^\circ\text{C}$	32	mJ	
I_D	Continuous Drain current	$V_{GS} = 18\text{V}$, $T_c = 25^\circ\text{C}$	10.2	A	Fig. 14
		$V_{GS} = 18\text{V}$, $T_c = 100^\circ\text{C}$	7.2		
$I_{D,pulse}$	Pulsed Drain Current	Pulse with t_p limited by T_{jmax}	14	A	
P_D	Power Dissipation	$T_c = 25^\circ\text{C}$, $T_j = 175^\circ\text{C}$	44.4	W	Fig. 16
T_j	Operating junction temperature		-55~175	°C	
T_{stg}	Storage temperature		-55~175	°C	



TO-252-2L





Thermal Characteristics

Symbol	Parameter	Value			Unit	Note
		Min.	Typ.	Max.		
$R_{th(jc)}$	Thermal resistance from Junction to Case		3.38		K/W	Fig. 15
$R_{th(ja)}$	Thermal resistance from Junction to Ambient		40		K/W	

Electrical Characteristics (T_c = 25°C unless otherwise specified)

Static Characteristics

Symbol	Parameter	Test conditions	Value			Unit	Note
			Min.	Typ.	Max.		
$V_{(BR)DSS}$	Drain-Source Breakdown voltage	$V_{GS} = 0V, I_D = 100\mu A$	800			V	
$V_{GS(th)}$	Gate Threshold voltage	$V_{GS} = V_{DS}, I_D = 0.7mA$		2.6		V	Fig. 9
		$V_{GS} = V_{DS}, I_D = 0.7mA, T_j = 175^\circ C$		1.9			
I_{GSS}	Gate-Source Leakage current	$V_{GS} = 18V, V_{DS} = 0V$			250	nA	
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 800V, V_{GS} = 0V, T_j = 25^\circ C$		5	50	μA	
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS} = 15V, I_D = 2A$ $V_{GS} = 18V, I_D = 2A$		704 550	750	$m\Omega$	Fig. 3, 4, 5
		$V_{GS} = 15V, I_D = 2A, T_j = 175^\circ C$ $V_{GS} = 18V, I_D = 2A, T_j = 175^\circ C$		744 670			
g_{fs}	Transconductance	$V_{DS} = 15V, I_D = 2A$		1.4		S	Fig. 6
		$V_{DS} = 15V, I_D = 2A, T_j = 175^\circ C$		1.2			



Gate Charge Characteristics

Symbol	Parameter	Test conditions	Value			Unit	Note
			Min.	Typ.	Max.		
Q _{GS}	Gate to Source Charge	$V_{DS} = 400V$ $I_D = 2A$ $V_{GS} = -4V/18V$		1.2		nC	Fig. 10
Q _{GD}	Gate to Drain Charge			3.9			
Q _G	Total Gate Charge			6.6			

AC Characteristics

Symbol	Parameter	Test conditions	Value			Unit	Note
			Min.	Typ.	Max.		
C _{iss}	Input Capacitance	$V_{GS} = 0V, V_{DS} = 600V$ $f = 1 MHz$ $V_{AC} = 25mV$		89		pF	Fig. 13
C _{oss}	Output Capacitance			19		pF	
C _{rss}	Reverse Transfer Capacitance			2.3		pF	
R _{G(int)}	Internal Gate Resistance	f=1 MHz, V _{AC} = 25mV		8		Ω	

Reverse Diode Characteristics

Symbol	Parameter	Test conditions	Value			Unit	Note
			Min.	Typ.	Max.		
V _{SD}	Diode Forward Voltage	$V_{GS} = -4V, I_{SD} = 1A$		1.35		V	Fig. 7,8
		$V_{GS} = -4V, I_{SD} = 1A, T_j = 175^\circ C$		1.65			
I _S	Continuous Diode Forward Current	$V_{GS} = -4V, T_C = 25^\circ C$		8.3		A	
I _{S,pulse}	Diode pulse Current	$V_{GS} = -4V$, pulse width t _p limited by T _{jmax}		14		A	



Typical Performance

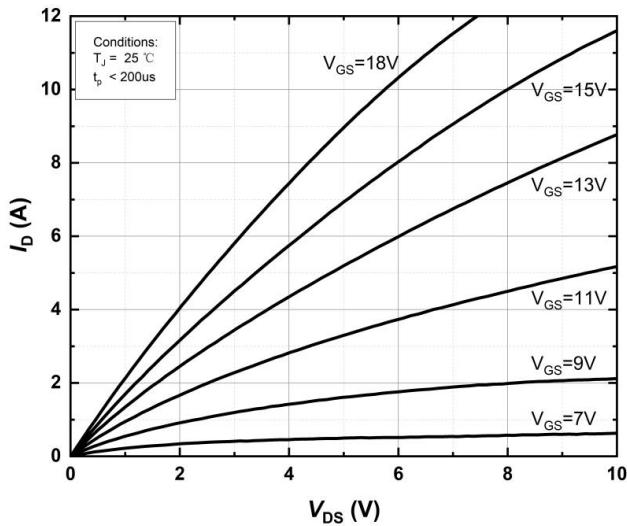


Figure 1. Output characteristics at $T_j=25^\circ\text{C}$

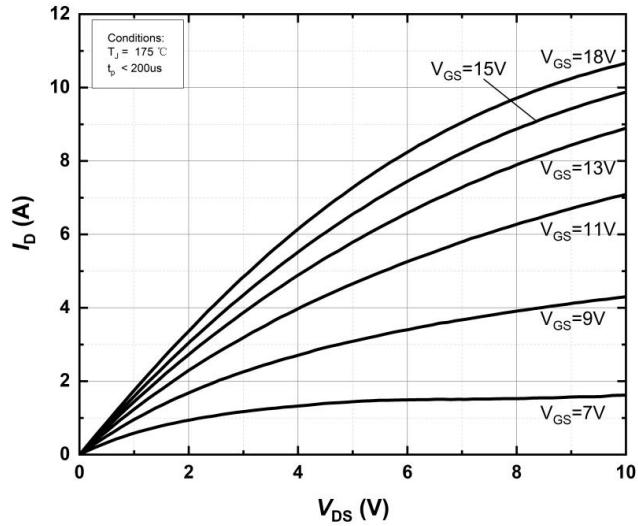


Figure 2. Output characteristics at $T_j=175^\circ\text{C}$

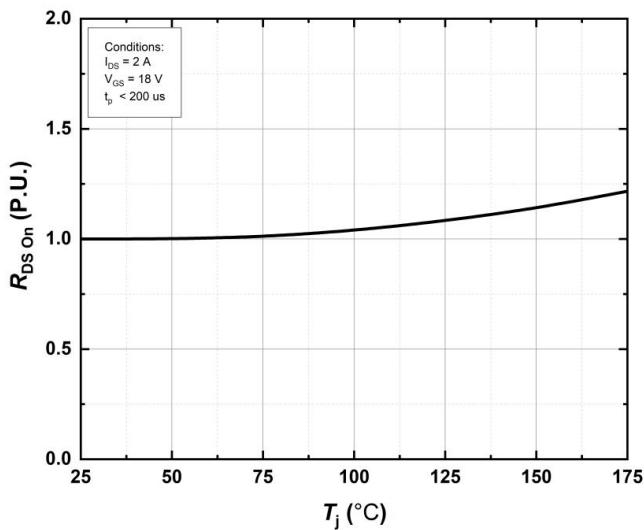


Figure 3. Normalized On-Resistance vs.
Temperature

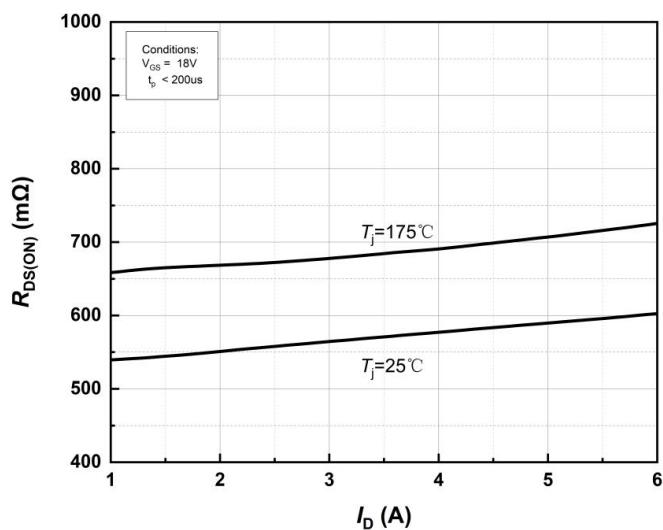


Figure 4. On-Resistance vs. Drain current for Various
Temperature

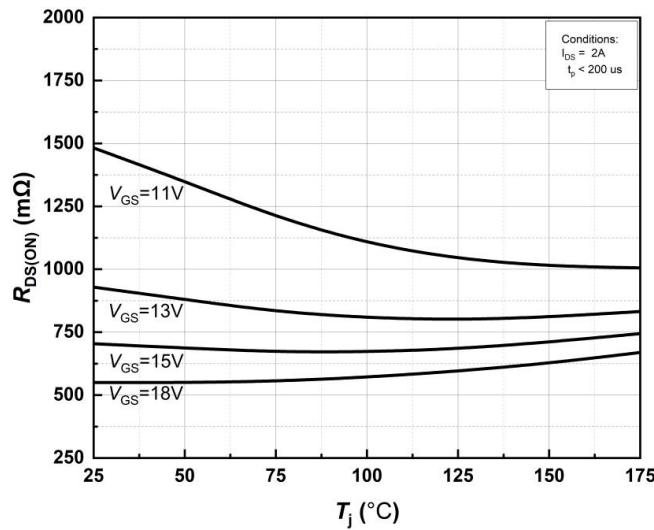


Figure 5. On-Resistance vs. Temperature for Various Gate Voltage

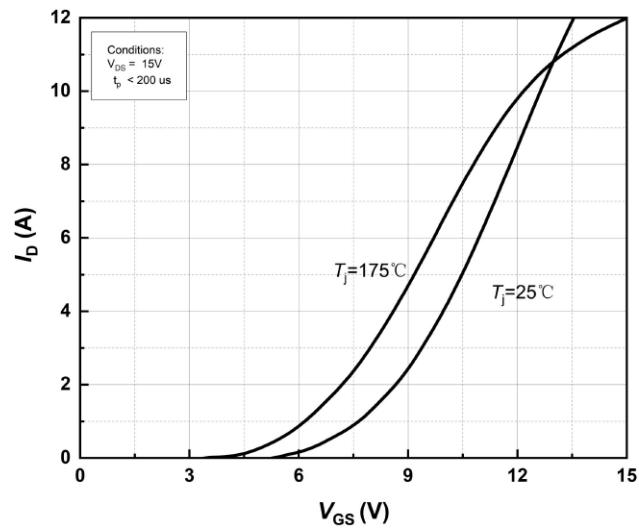


Figure 6. Transfer Characteristics for Various Junction Temperatures

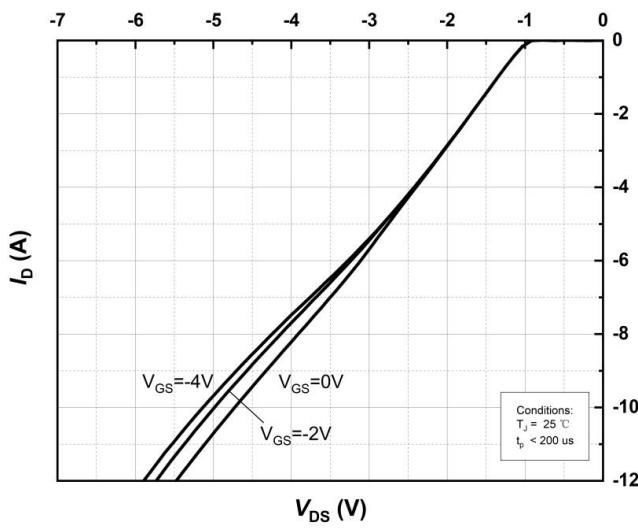


Figure 7. Body Diode Characteristics at $T_j=25^\circ\text{C}$

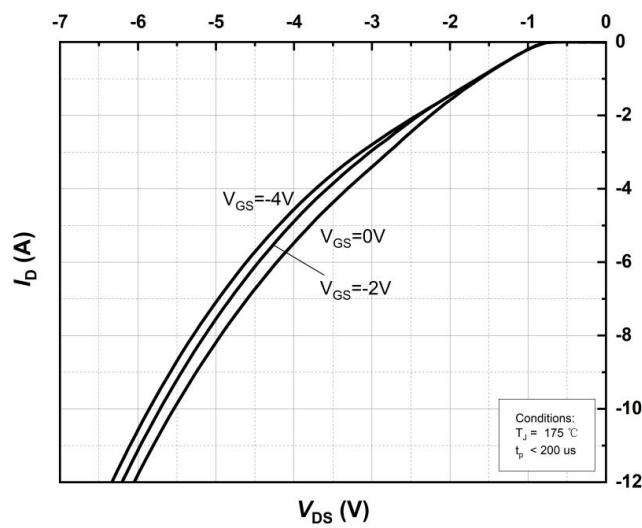


Figure 8. Body Diode Characteristics at $T_j=175^\circ\text{C}$

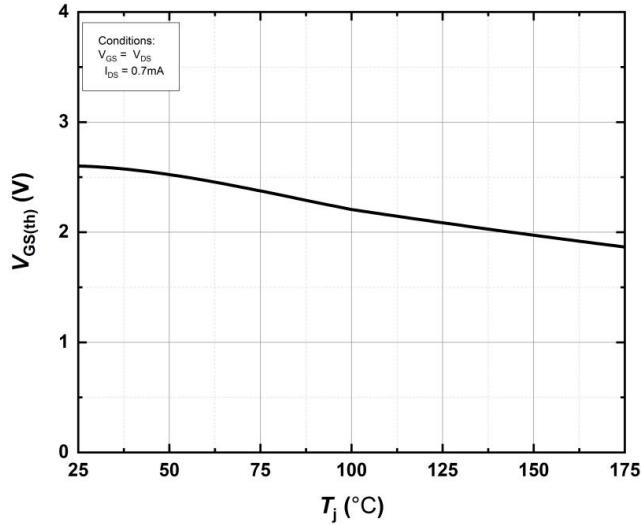


Figure 9. Threshold Voltage vs. Temperature

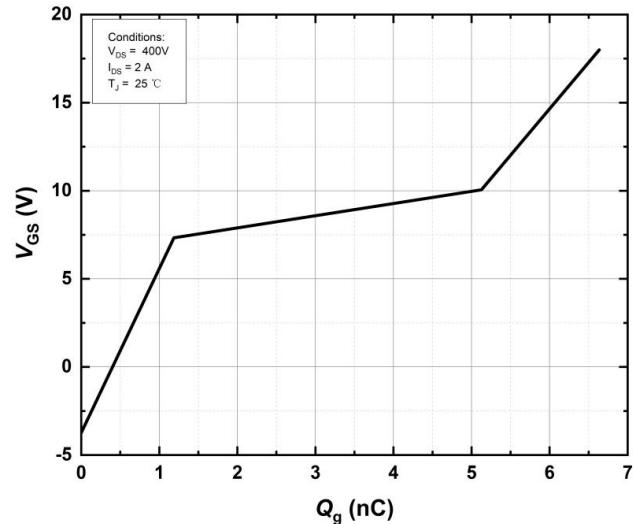


Figure 10 Gate Charge Characteristics

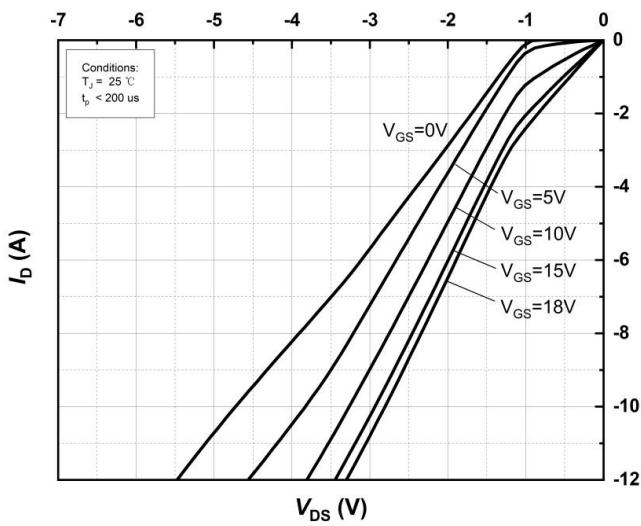


Figure 11. 3rd Quadrant Characteristic at $T_j=25^\circ\text{C}$

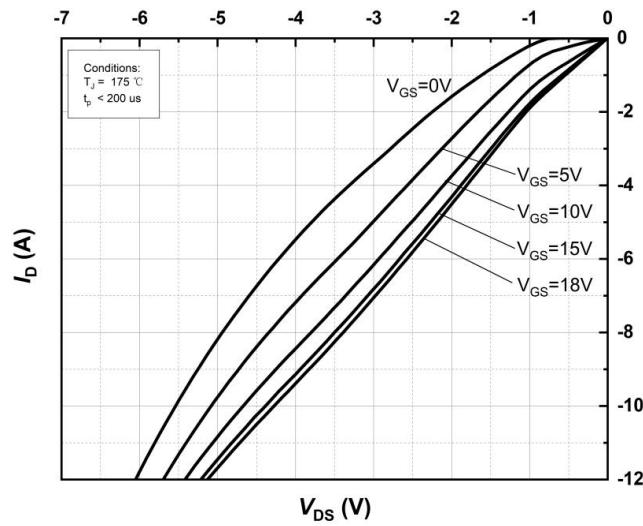


Figure 12. 3rd Quadrant Characteristic at $T_j=175^\circ\text{C}$

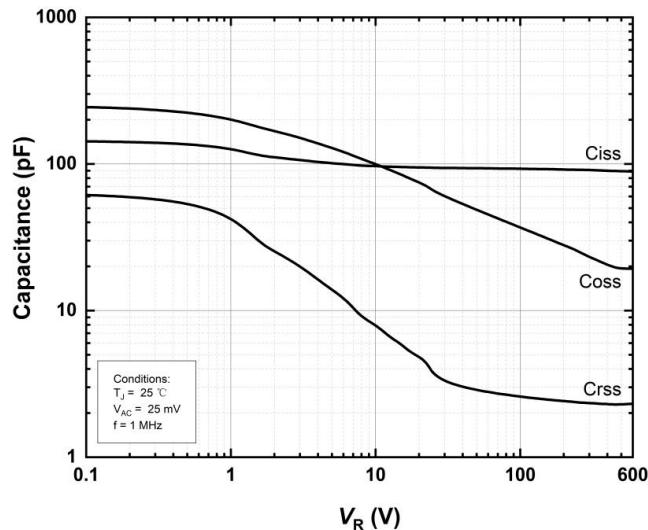


Figure 13. Capacitances vs. Drain-Source Voltage (0 - 600V)

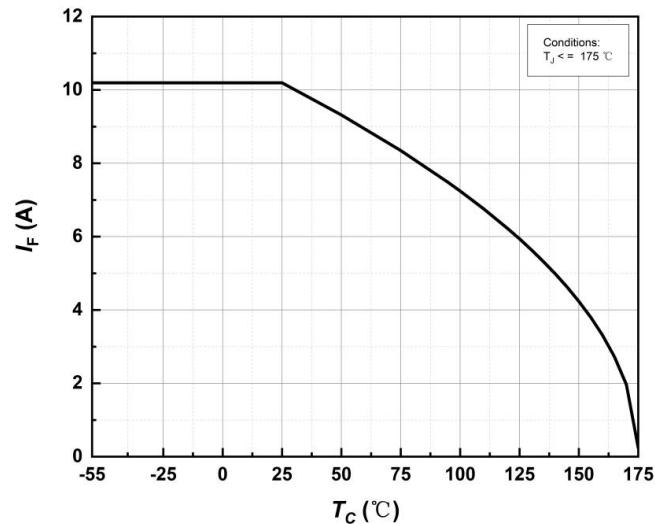


Figure 14. Continuous Drain Current Derating vs Case Temperature

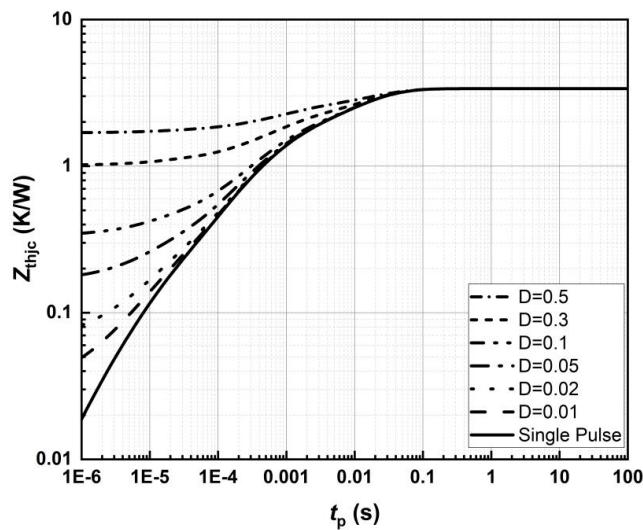


Figure 15. Transient Thermal Impedance (Junction - Case)

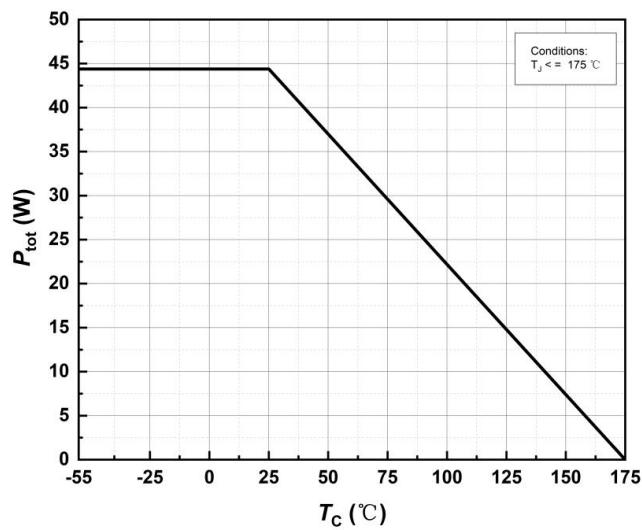


Figure 16. Maximum Power Dissipation Derating vs. Case Temperature

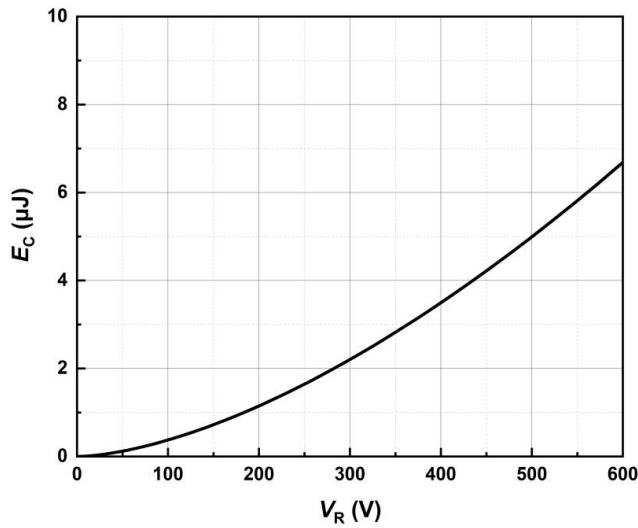


Figure 17. Output Capacitor Stored Energy

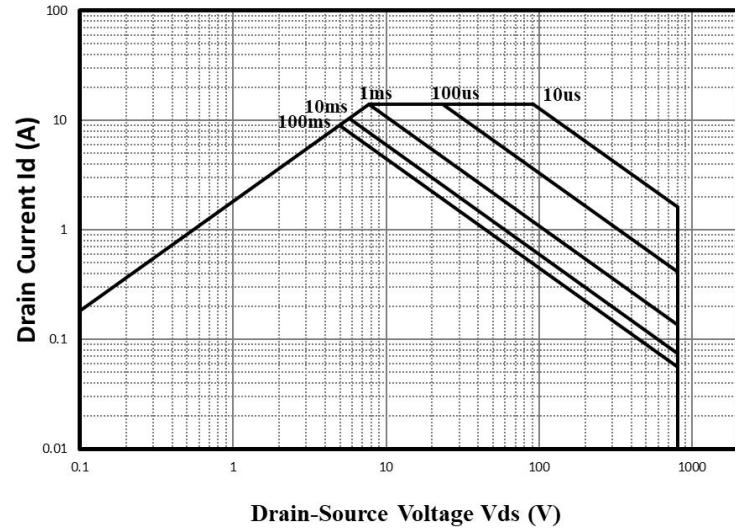
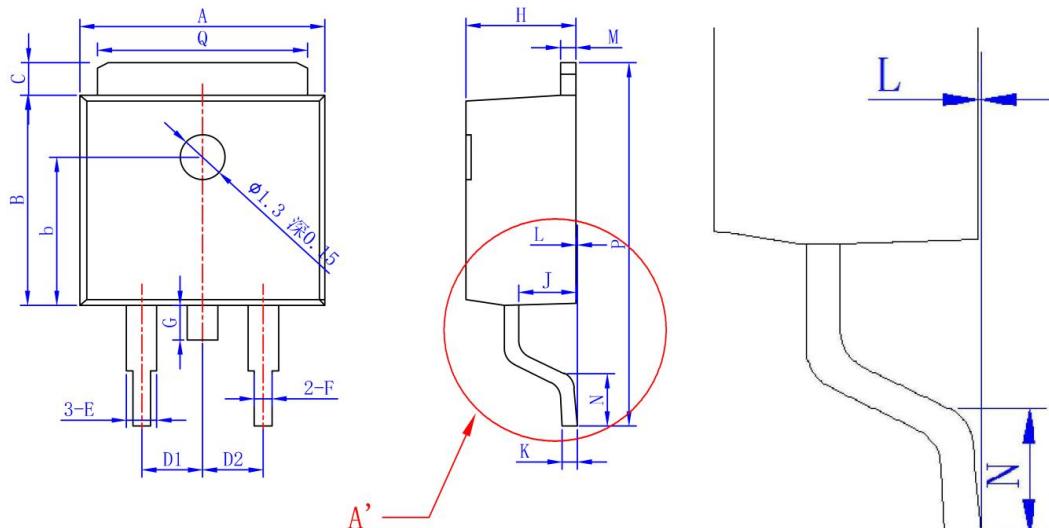


Figure 18. Safe Operating Area

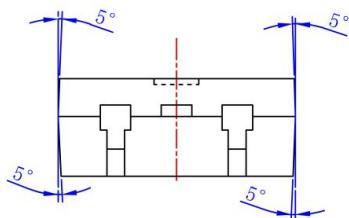


Package Dimensions

Package TO-252-2L



A' 部分放大



SYMBOL	MM		
	MIN	NOM	MAX
*A	6.30	6.55	6.90
*B	5.90	6.10	6.30
b	4.10	4.30	4.50
C	0.90	1.00	1.10
*D1		2.29BSC	
*D2		2.29BSC	
*E	0.61	0.76	0.91
*F	0.50	0.60	0.70
G	0.60	0.80	1.00
*H	2.10	2.30	2.50
*J	0.90	1.00	1.10
*K	0.40	0.50	0.60
*L	0.00	0.05	0.127
*M	0.45	0.50	0.55
*N	1.39		1.77
*P	9.60	9.90	10.30
Q	5.10	5.30	5.50

带*为必须检验尺寸



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