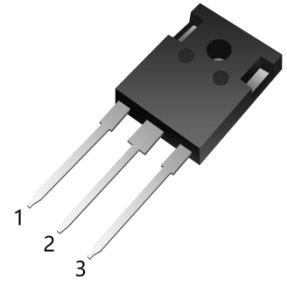
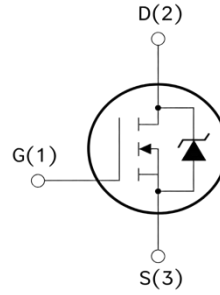


Silicon Carbide Power MOSFET

Parameter	Value	Unit
V_{DS}	1700	V
I_D	100	A
$R_{DS(ON)}$	25	m Ω
Q_G	168	nC



TO-247-3L

Features

- High Speed Switching with Low Capacitances
- High Blocking Voltage with Low $R_{DS(on)}$
- Low impedance package with driver source pin
- Easy to parallel and simple to drive

Applications

- Motor Driver
- Compressor Inverter
- Photovoltaic (PV) Inverter
- High Voltage DC/DC Converters
- Switched-Mode Power Supply(SMPS)

Absolute Maximum Ratings (at $T_J=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-source Voltage	V_{DS}	1700	V
Gate-source Voltage	V_{GS}	-10/+22	V
Drain Current (continuous; $T_c=25^{\circ}C$)	I_D	100	A
Drain Current (continuous; $T_c=100^{\circ}C$)		75	
Drain Current (pulsed)	I_{DM}	200	A
Power Dissipation ($T_c=25^{\circ}C$)	P_D	484	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to +175	$^{\circ}C$
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.31	$^{\circ}C/W$
Thermal Resistance From Junction to Ambient	$R_{\theta JA}$	40	

Electrical Characteristics

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Static characteristics (at $T_C=25^\circ\text{C}$ unless otherwise specified)						
Drain-Source Breakdown Voltage	$B_{V_{DS}}$	$V_{GS}=0\text{V}; I_D=250\mu\text{A}$	1700	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=1700\text{V}; V_{GS}=0\text{V}$	-	5	100	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=-10/+20\text{V}; V_{DS}=0\text{V}$	-	-	150	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}; I_{DS}=10\text{mA}$	2	3	4	V
Recommended Turn-on Voltage	$V_{GS(on)}$	Static	-	18	-	V
Recommended Turn-off Voltage	$V_{GS(off)}$		-	-5	-	V
Static Drain-Source on Resistance	$R_{DS(on)}$	$V_{GS}=18\text{V}; I_D=50\text{A}; T_J=25^\circ\text{C}$	-	25	30	m Ω
		$V_{GS}=18\text{V}; I_D=50\text{A}; T_J=175^\circ\text{C}$	-	43	-	
Dynamic characteristics (at $T_C=25^\circ\text{C}$ unless otherwise specified)						
Input Capacitance	C_{iss}	$V_{DS}=1200\text{V}; f=1\text{MHz}; V_{AC}=25\text{mV}$	-	6450	-	pF
Output Capacitance	C_{oss}		-	190	-	
Reverse Transfer Capacitance	C_{rss}		-	16	-	
Transconductance	g_{fs}	$V_{DS}=10\text{V}; I_D=50\text{A}$	-	52	-	S
C_{OSS} Stored Energy	E_{OSS}	$V_{DS}=1200\text{V}; f=1\text{MHz}$	-	150	-	μJ
Turn-on Energy	E_{on}	$V_{DS}=1200\text{V}; V_{GS}=-5/+18\text{V}; I_D=50\text{A}; R_{g(ext)}=2.5\Omega; \text{Load}=150\mu\text{H}$	-	3.62	-	mJ
Turn-off Energy	E_{off}		-	0.875	-	
Total Gate Charge	Q_G	$V_{DS}=1200\text{V}; V_{GS}=-5/+18\text{V}; I_D=50\text{A}$	-	168	-	nC
Gate-Source Charge	Q_{GS}		-	52	-	
Gate-Drain Charge	Q_{GD}		-	50	-	
Internal Gate Resistor	R_{Gint}	$f=1\text{MHz}; V_{AC}=25\text{mV}$	-	2.5	-	Ω
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=1200\text{V}; V_{GS}=-5/+18\text{V}; I_D=50\text{A}; R_{g(ext)}=2.5\Omega; \text{Load}=150\mu\text{H}$	-	35	-	ns
Rise Time	t_r		-	66	-	
Turn-off Delay Time	$t_{d(off)}$		-	61	-	
Fall Time	t_f		-	50	-	

Reverse SiC Diode Characteristics(at $T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Values			Units
			Min.	Typ.	Max.	
Diode Forward Voltage	V_{FSD}	$V_{GS}=0\text{V}; I_F=37.5\text{A}; T_J=25^\circ\text{C}$	-	3.6	6	V
		$V_{GS}=0\text{V}; I_F=37.5\text{A}; T_J=175^\circ\text{C}$	-	3.2	6	
Continuous Diode Forward Current	I_S	$V_{GS}=0\text{V}; T_C=25^\circ\text{C}$	-	100	-	A
Reverse Recovery Time	t_{RR}	$V_R=1200\text{V}; V_{GS}=-5\text{V}; I_F=50\text{A}; di/dt=500\text{A}/\mu\text{s}; T_J=175^\circ\text{C}$	-	35	-	ns
Reverse Recovery Charge	Q_{RR}		-	918	-	nC
Peak Reverse Recovery Current	I_{RRM}		-	36	-	A

Typical Characteristics

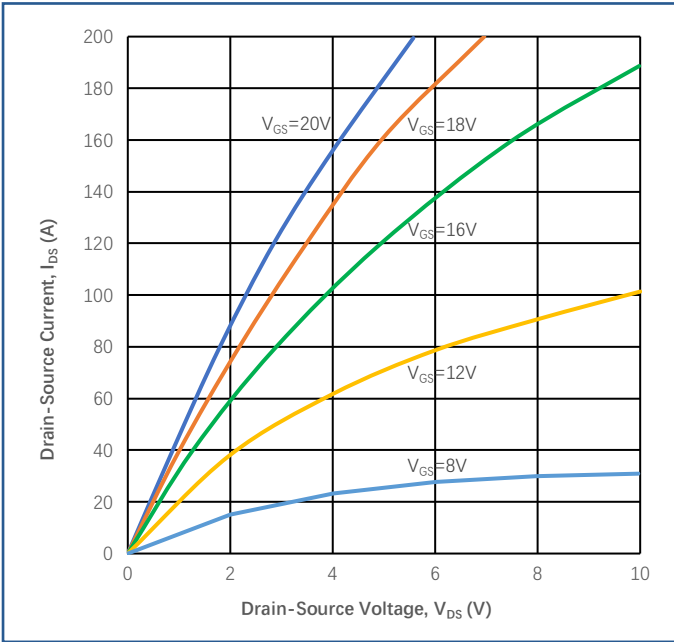


Fig 1
Output Characteristics ($T_J=25^\circ\text{C}$)

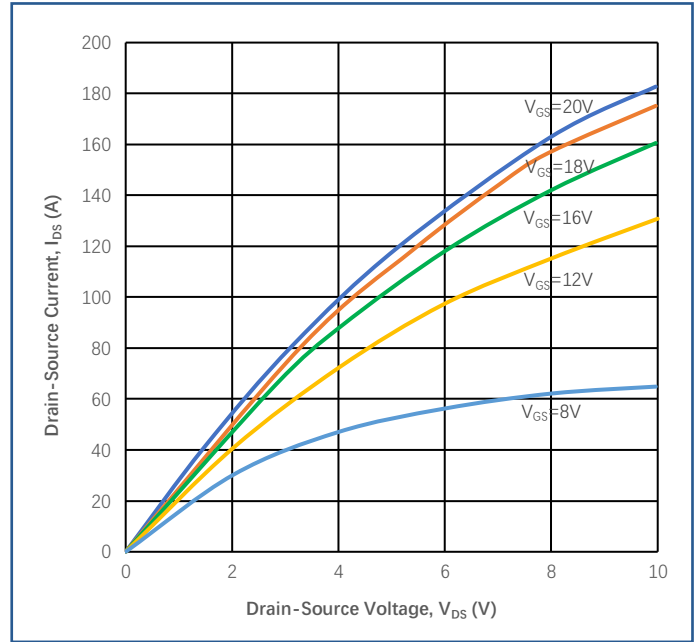


Fig 2
Output Characteristics ($T_J=175^\circ\text{C}$)

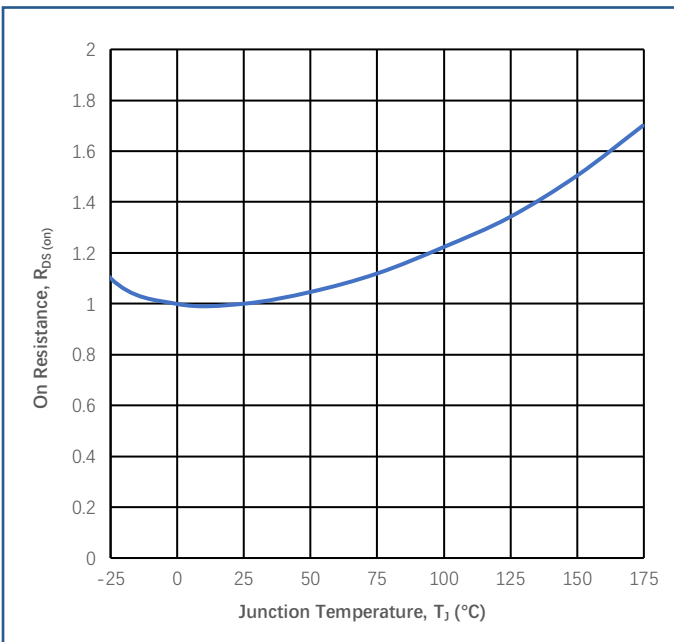


Fig 3
Normalized On-Resistance vs. Temperature

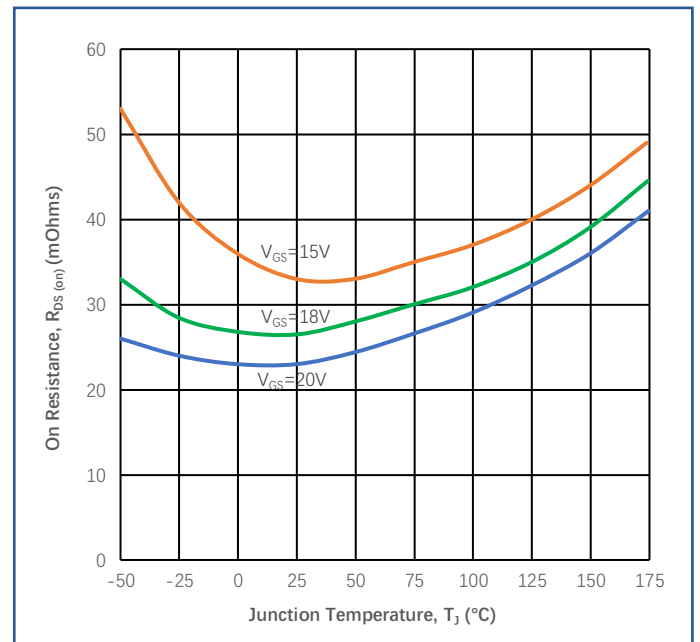


Fig 4
On-Resistance vs. Temperature

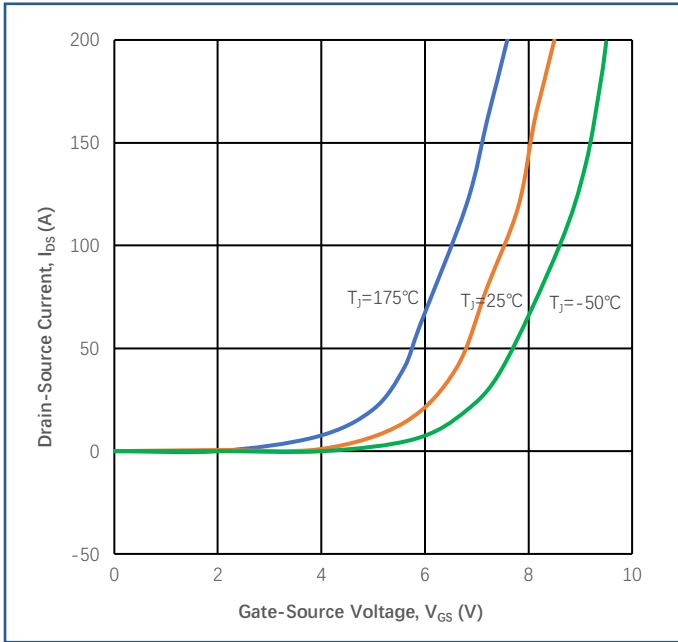


Fig 5
 Transfer Characteristic

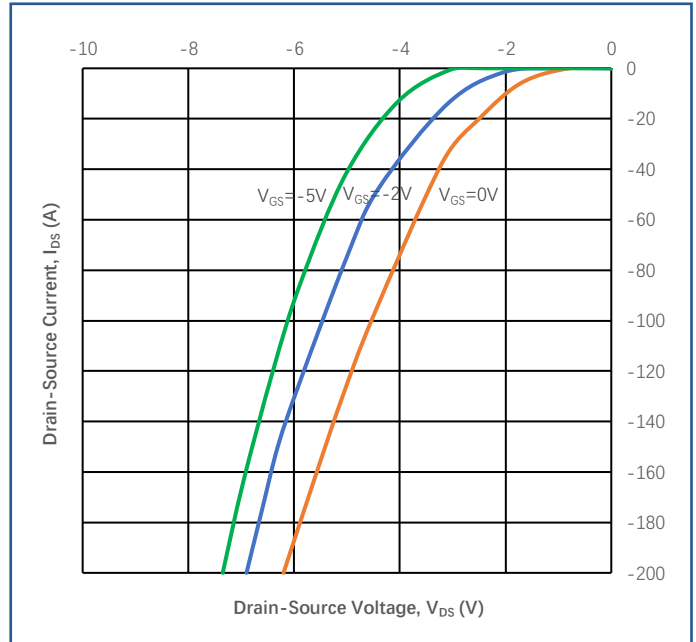


Fig 6
 Body Diode Characteristic at 25°C

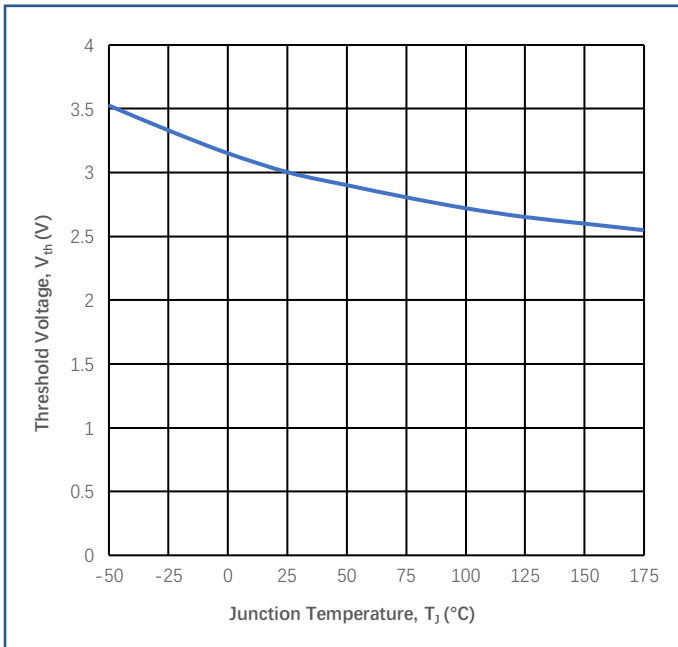


Fig 7
 Threshold Voltage vs. Temperature

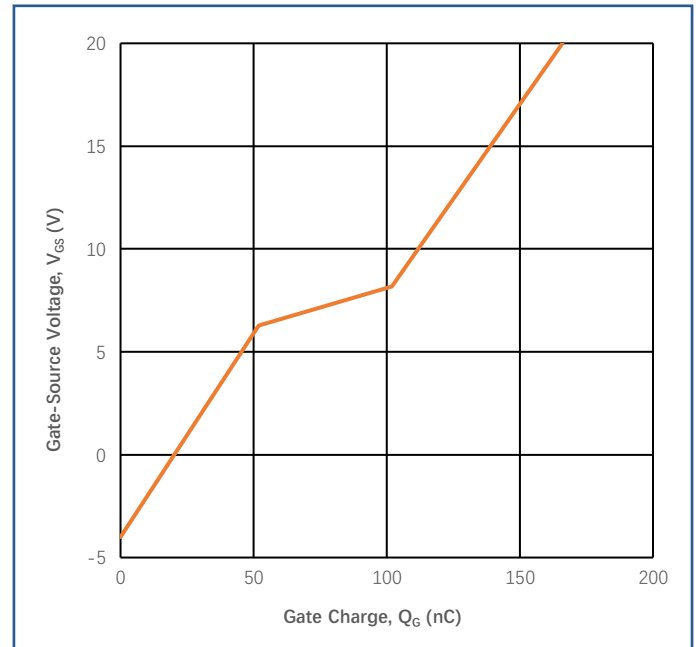


Fig 8
 Gate Charge Characteristics

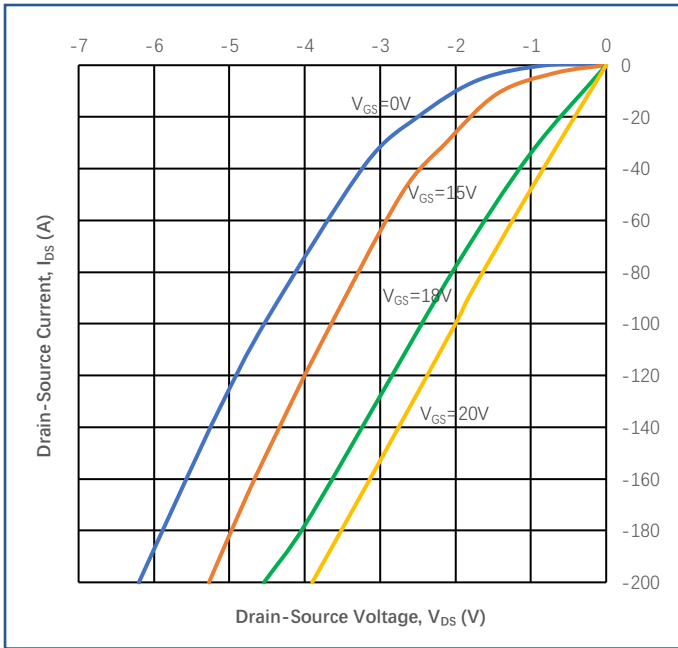


Fig 9
3rd Quadrant Characteristic at 25°C

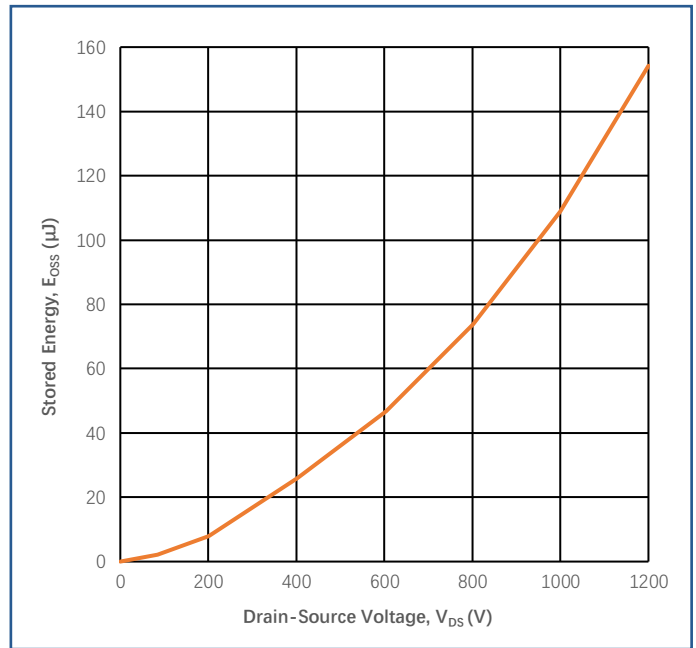


Fig 10
Output Capacitor Stored Energy

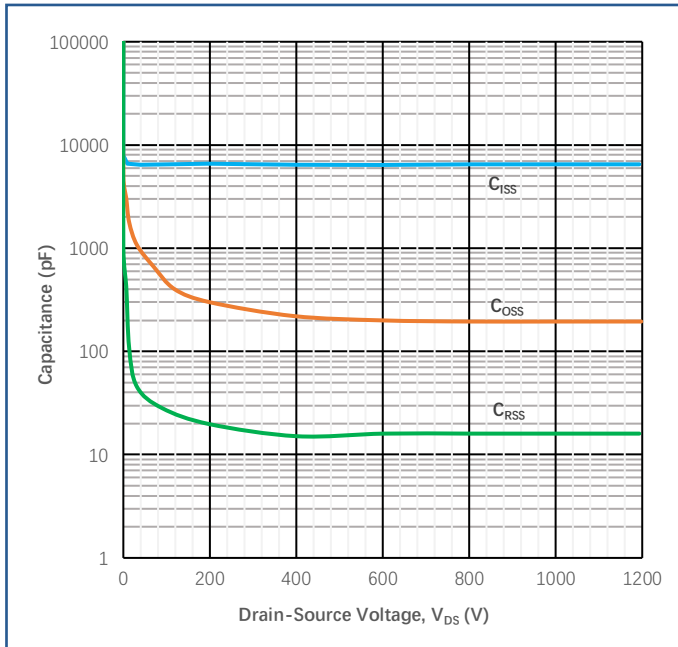


Fig 11
Capacitances vs. Drain-Source

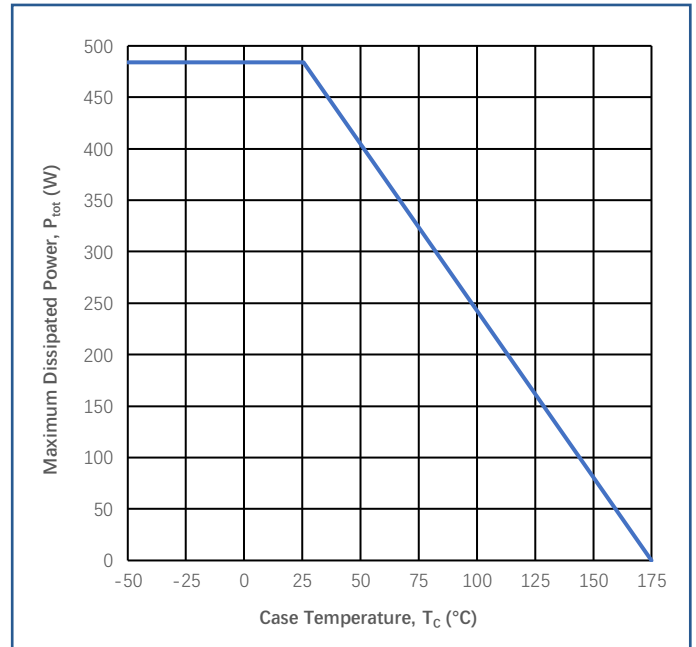


Fig 12
Max Power Dissipation Derating vs T_C

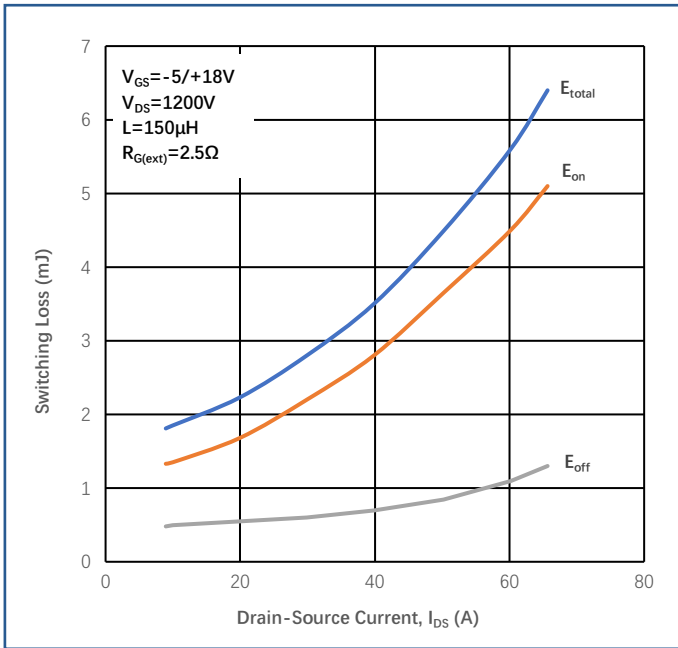


Fig 13
Switching Energy vs. Drain Current

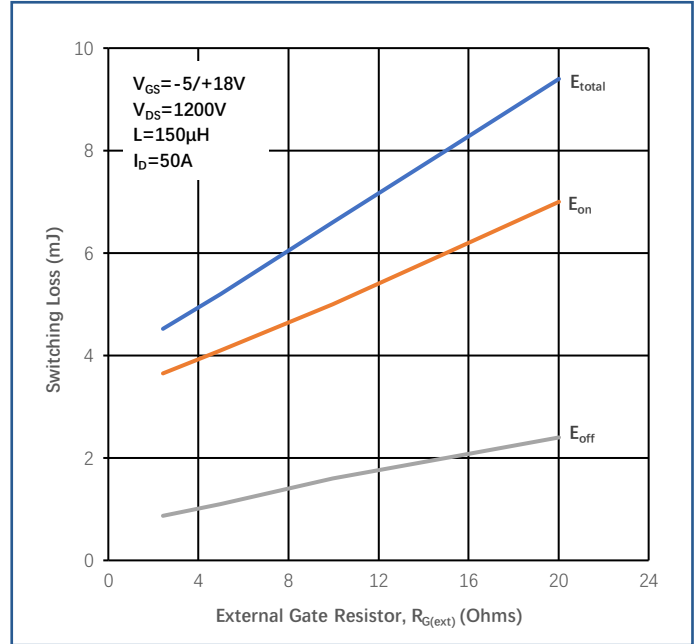


Fig 14
Switching Energy vs. $R_{G(ext)}$

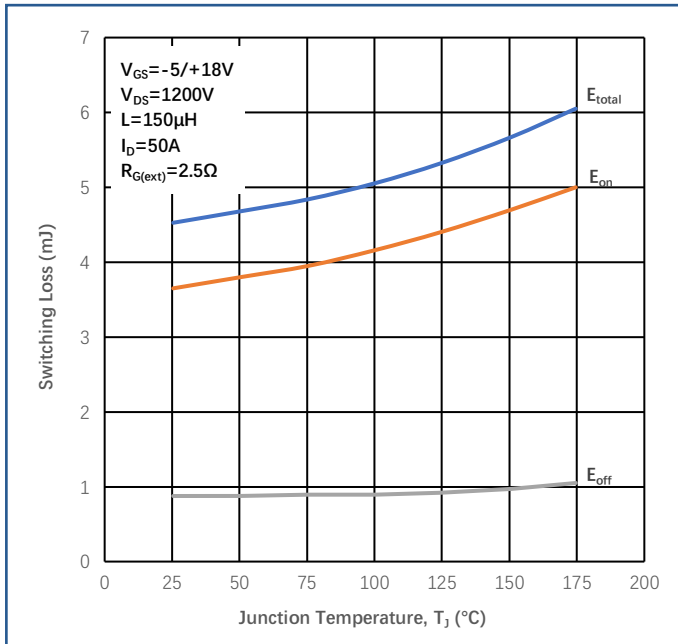


Fig 15
Switching Energy vs. Temperature

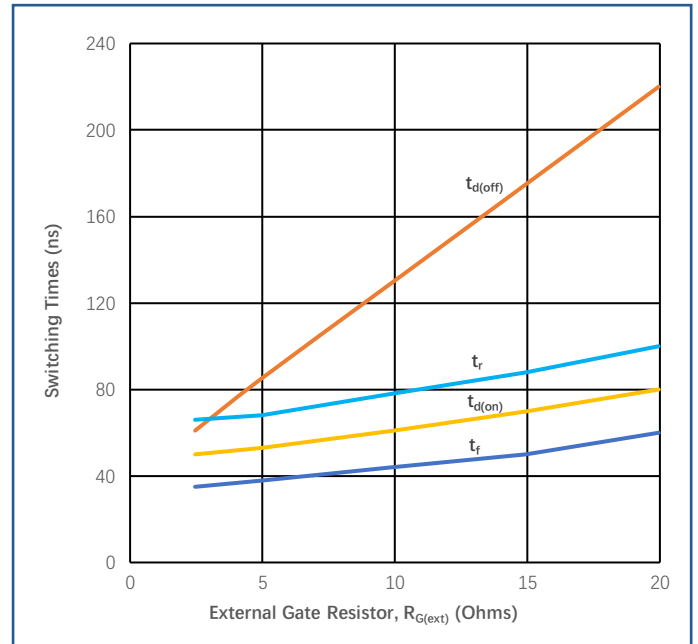


Fig 16
Switching Times vs. $R_{G(ext)}$

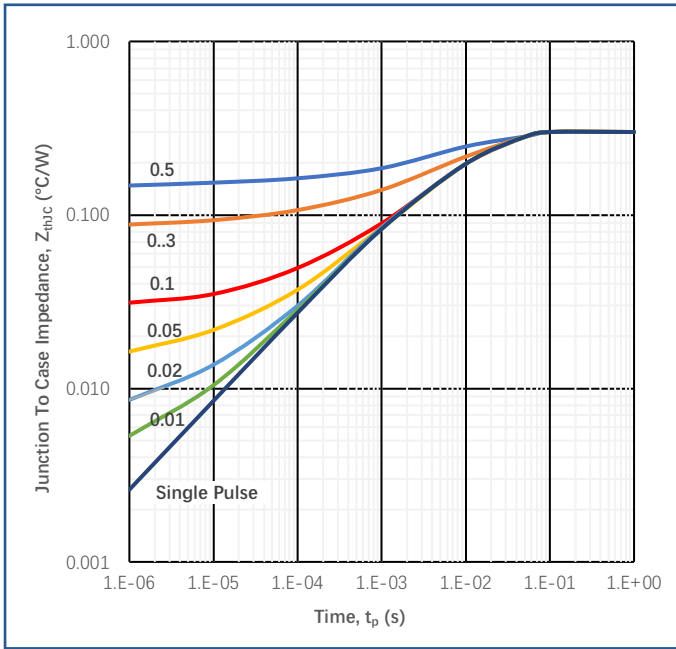


Fig 17
Transient Thermal Impedance

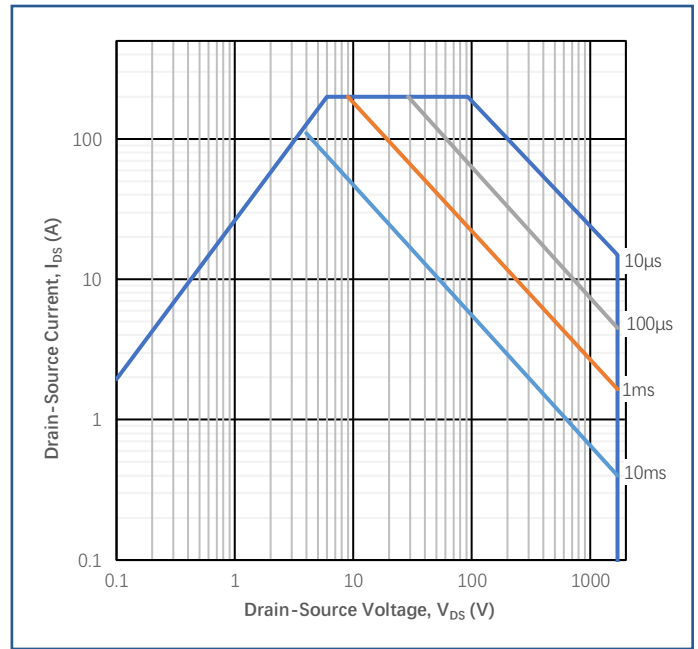
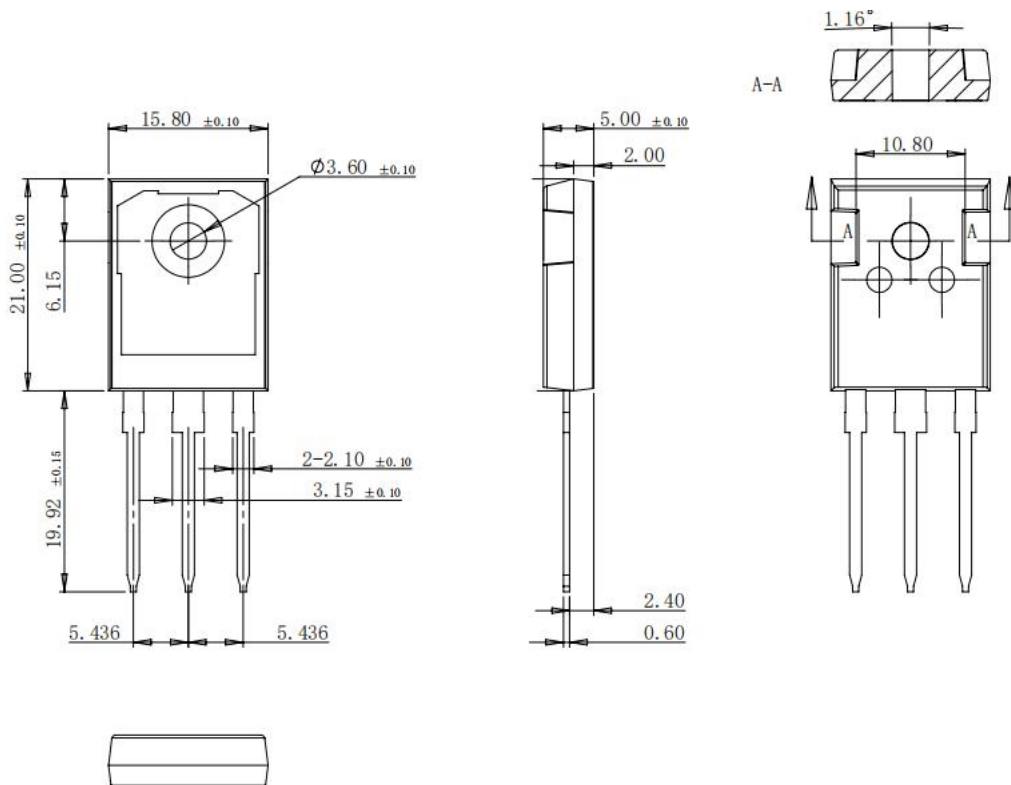


Fig 18
Safe Operating Area

Package Outlines(Unit:mm)

TO-247-3L



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