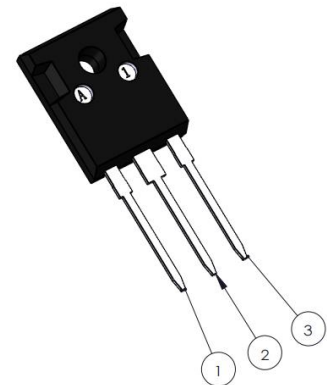


**Description**

Silicon Carbide (SiC) MOSFET use a completely new technology that provide superior switching performance and higher reliability compared to Silicon. In addition, the low ON resistance and compact chip size ensure low capacitance and gate charge. Consequently, system benefits include highest efficiency, faster operating frequency, increased power density, reduced EMI, and reduced system size.

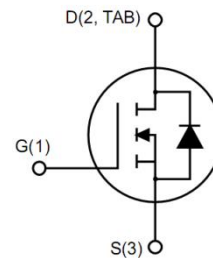
**Features**

- High Speed Switching with Low Capacitances
- High Blocking Voltage with Low RDS(on)
- Optimized package with separate driver source pin
- Easy to parallel and simple to drive
- ROHS Compliant, Halogen free



**Application**

- EV motor drive
- High Voltage DC/DC Converters
- Switch Mode Power Supplies
- Solar inverters
- EV charging



**Ordering Information**

Part Number	Marking	Package	Packaging
AMG100N1700MT3	AMG100N1700MT3	TO-247-3	Tube

**Absolute Maximum Ratings(Tc=25°C)**

Symbol	Parameter	Value	Unit
V <sub>DS</sub>	Drain-Source Voltage	1700	V
I <sub>D</sub>	Drain Current(continuous)at Tc=25°C	100	A
I <sub>D</sub>	Drain Current(continuous)at Tc=100°C	75	A
I <sub>DM</sub>	Drain Current (pulsed)	200	A
V <sub>GS</sub>	Gate-Source Voltage	-8/+19	V
P <sub>D</sub>	Power Dissipation T <sub>c</sub> = 25°C	470	W
T <sub>J</sub> , T <sub>stg</sub>	Junction and Storage Temperature Range	-55 to +175	°C

**Electrical Characteristics(T<sub>J</sub> = 25°C unless otherwise specified)**
**Typical Performance-Static**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV <sub>DS</sub>	Drain-source Breakdown Voltage	I <sub>D</sub> =250uA, V <sub>GS</sub> =0V	1700			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =1700V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C		5	100	uA
I <sub>GSS</sub>	Gate-body Leakage Current	V <sub>DS</sub> =0V ; V <sub>GS</sub> =-8 to 19V		10	250	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =20mA	1.8	2.5	3.6	V
V <sub>GS(on)</sub>	Recommended turn-on Voltage	Static		15		V
V <sub>GS(off)</sub>	Recommended turn-off Voltage			-4		V
R <sub>DS(on)</sub>	Static Drain-source On Resistance	V <sub>GS</sub> =15V, I <sub>D</sub> =50A		25	30	mΩ
		V <sub>GS</sub> =15V, I <sub>D</sub> =50A T <sub>J</sub> =175°C		42		mΩ

**Typical Performance-Dynamic**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =1200V, f=1MHz, V <sub>AC</sub> =25mV		6465		pF
C <sub>oss</sub>	Output Capacitance			195		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			16		pF
g <sub>fs</sub>	Transconductance	V <sub>DS</sub> =20V, I <sub>D</sub> =50A		60		S
E <sub>oss</sub>	C <sub>oss</sub> Stored Energy	V <sub>DS</sub> =1200V, f=1MHz		109		μJ
E <sub>ON</sub>	Turn-On Energy (Body Diode)	V <sub>DS</sub> =1200V, V <sub>GS</sub> =-4/15V, I <sub>D</sub> =50A, L=150uH T <sub>J</sub> =175°C		4.5		mJ
E <sub>OFF</sub>	Turn-Off Energy (Body Diode)			1.5		mJ
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =1200V, V <sub>GS</sub> =-4V/15V, I <sub>D</sub> =50 A,		166		nC
Q <sub>gs</sub>	Gate-source Charge			52		nC
Q <sub>gd</sub>	Gate-Drain Charge			50		nC
R <sub>G(int)</sub>	Internal Gate Resistance	f=1MHz, V <sub>AC</sub> =25mV		3		Ω
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =1200V, V <sub>GS</sub> =-4V/15V, I <sub>D</sub> =50A, L=150 μH R <sub>ext</sub> =2.5Ω		124		ns
t <sub>r</sub>	Rise Time			21		ns
t <sub>d(off)</sub>	Turn-off Delay Time			53		ns
t <sub>f</sub>	Fall Time			10		ns

**Typical Performance-Reverse Diode(T<sub>J</sub> = 25°C unless otherwise specified)**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V <sub>FSD</sub>	Forward Voltage	V <sub>GS</sub> =0V, I <sub>F</sub> =37.5A, T <sub>J</sub> =25°C		3.2	6	V
		V <sub>GS</sub> =0V, I <sub>F</sub> =37.5A, T <sub>J</sub> =175°C		2.9	6	V
I <sub>S</sub>	Continuous Diode Forward Current	V <sub>GS</sub> =0V, T <sub>C</sub> =25°C		100		A
t <sub>rr</sub>	Reverse Recovery Time	V <sub>GS</sub> =-4 V, I <sub>F</sub> =50 A, V <sub>R</sub> =1200 V, di/dt=1900 A/μs, T <sub>J</sub> =175°C		32		nS
Q <sub>rr</sub>	Reverse Recovery Charge			917		nC
I <sub>rrm</sub>	Peak Reverse Recovery Current			38		A

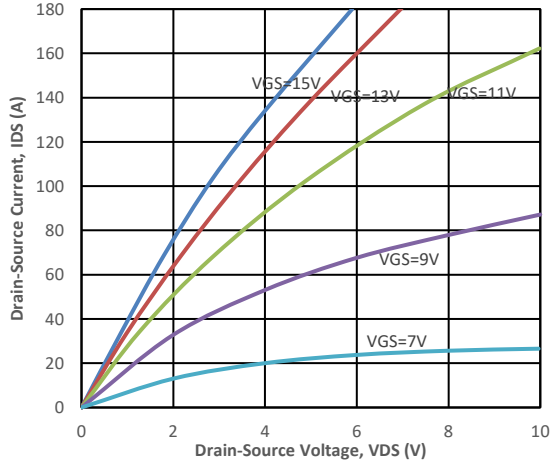
**Thermal Characteristics**

Symbol	Parameter	Value.	Unit
R <sub>θJC</sub>	Thermal Resistance, Junction-to-Case	0.32	°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction-to-Ambient	40	°C/W

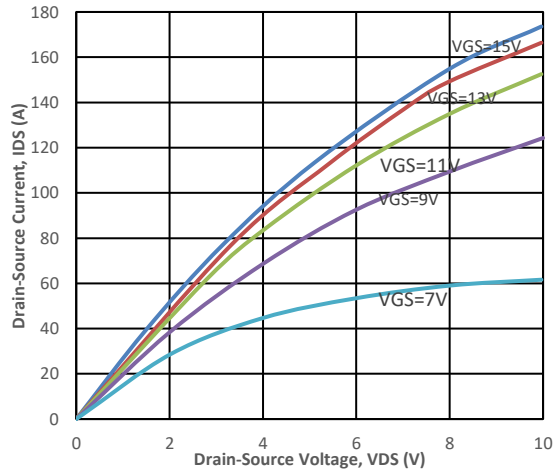
The values are based on the junction-to case thermal impedance which is measured with the device mounted to a large heat sink assuming maximum junction temperature of T<sub>J</sub>(max)=175°C

### Electrical Characteristics

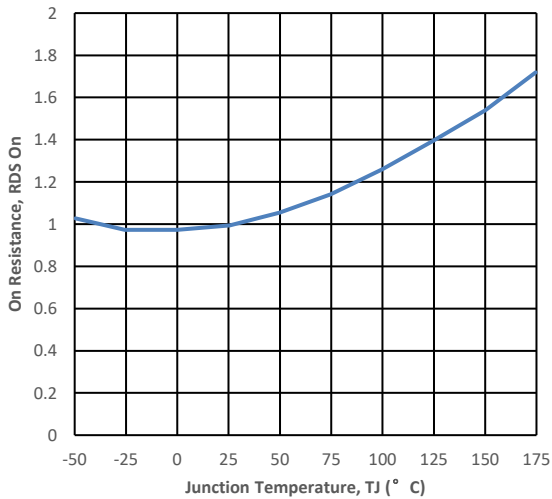
**Fig1. Output characteristics ( $T_J = 25^\circ\text{C}$ )**



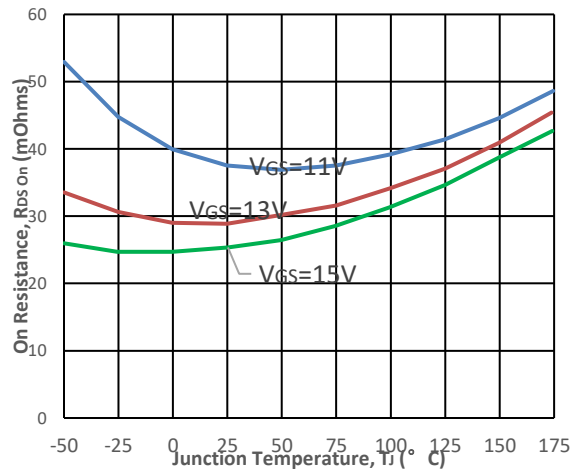
**Fig2. Output characteristics ( $T_J = 175^\circ\text{C}$ )**



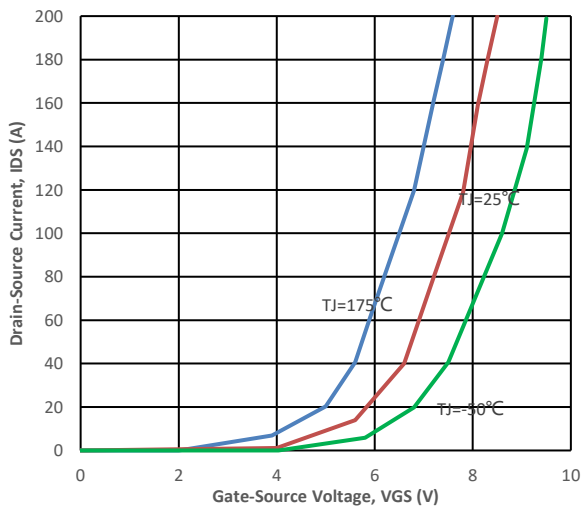
**Fig3. Normalized On-Resistance vs. Temperature**



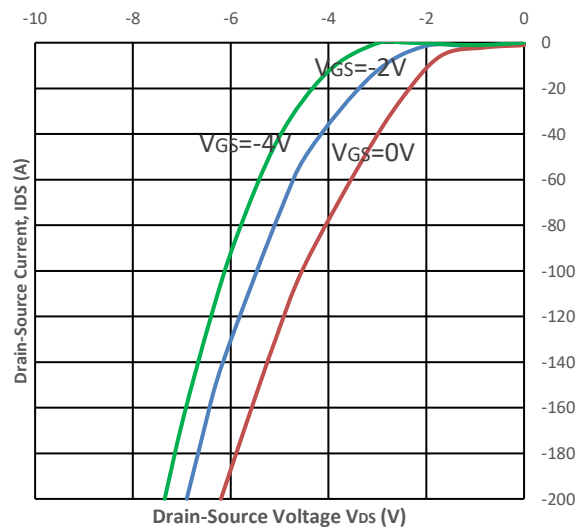
**Fig4. On-Resistance vs. Temperature**



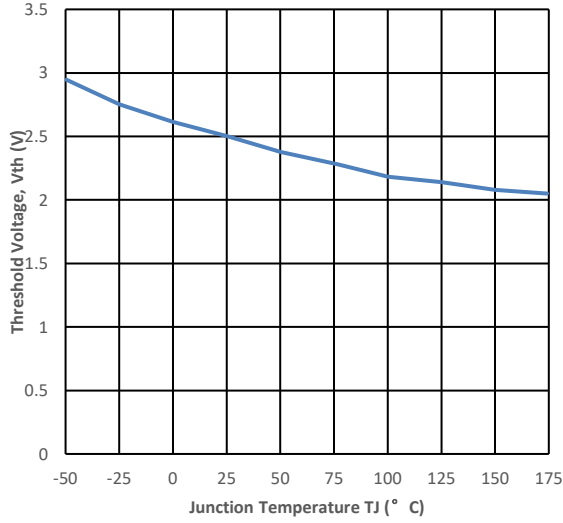
**Fig5. Transfer Characteristic**



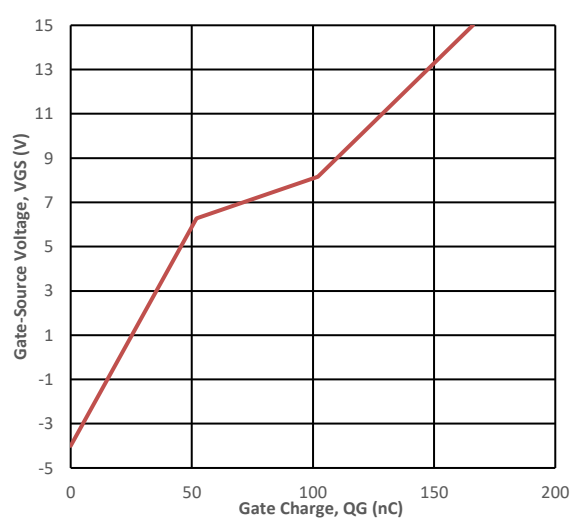
**Fig6. Body Diode Characteristic at 25 °C**



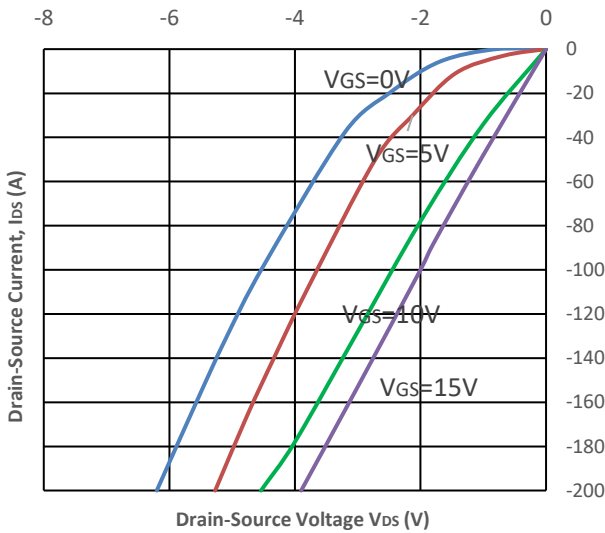
**Fig7. Threshold Voltage vs. Temperature**



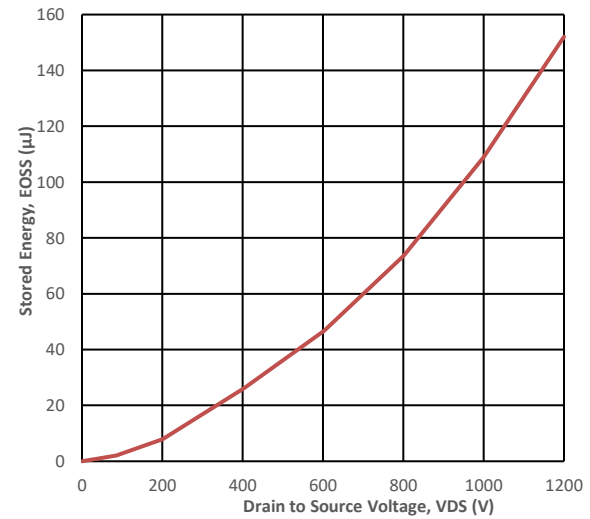
**Fig8. Gate Charge Characteristics**



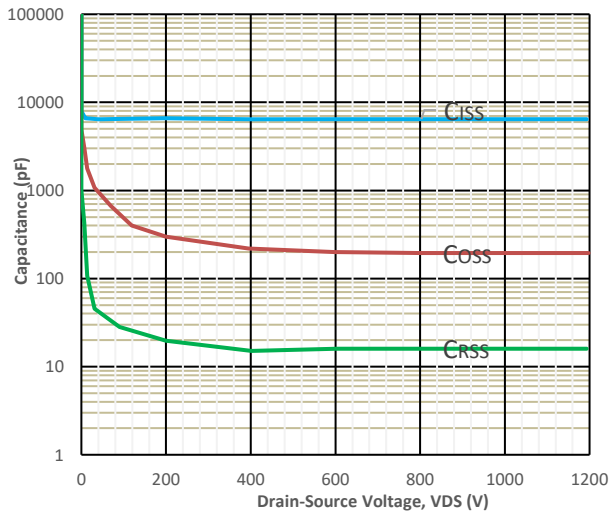
**Fig9. 3rd Quadrant Characteristic at 25 °C**



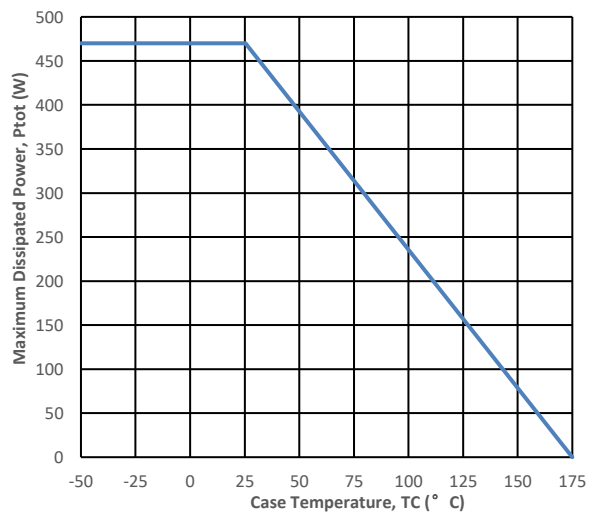
**Fig10. Output Capacitor Stored Energy**



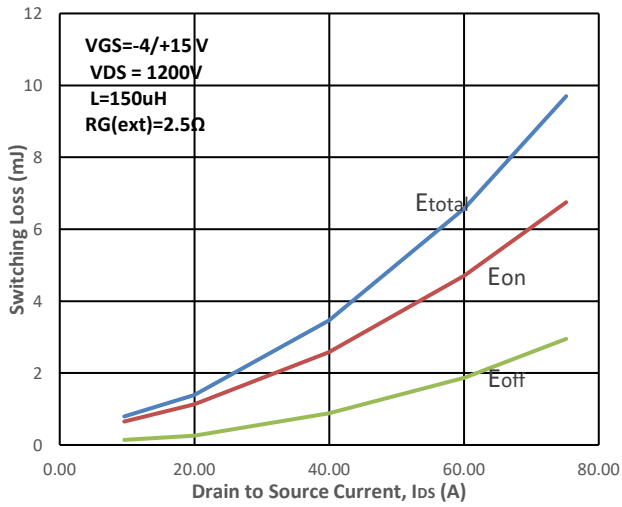
**Fig11. Capacitances vs. Drain-Source**



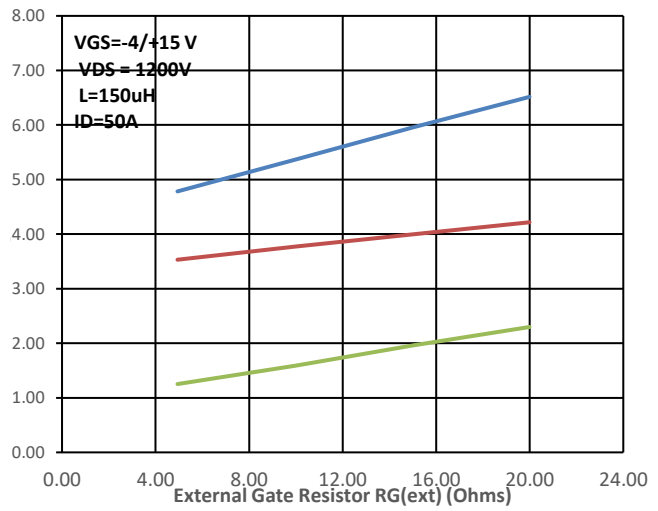
**Fig12. Max Power Dissipation Derating Vs T<sub>c</sub>**



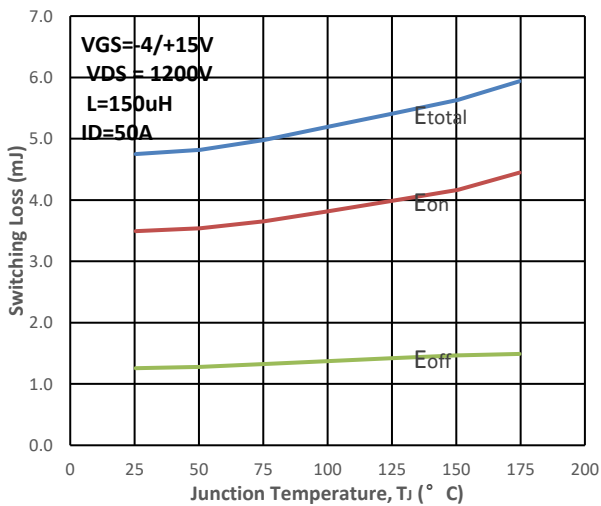
**Fig13. Switching Energy vs. Drain Current**



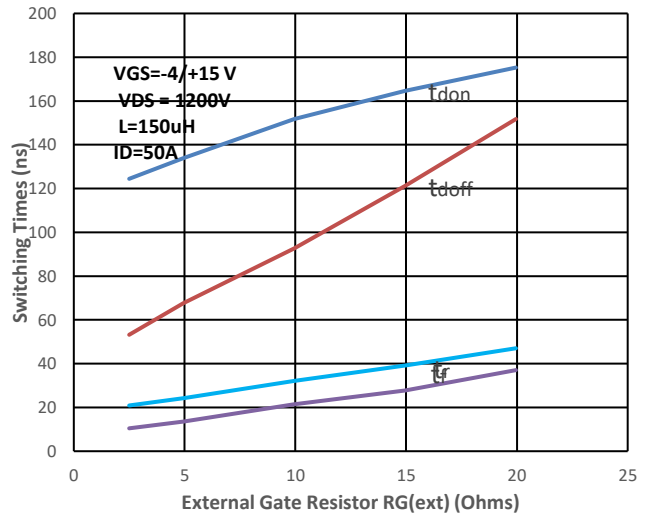
**Fig14. Switching Energy vs.  $R_{G(ext)}$**



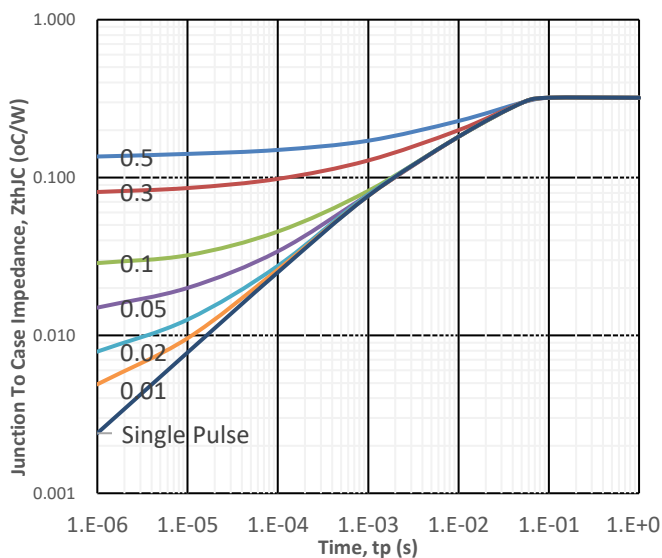
**Fig15. Switching Energy vs. Temperature**



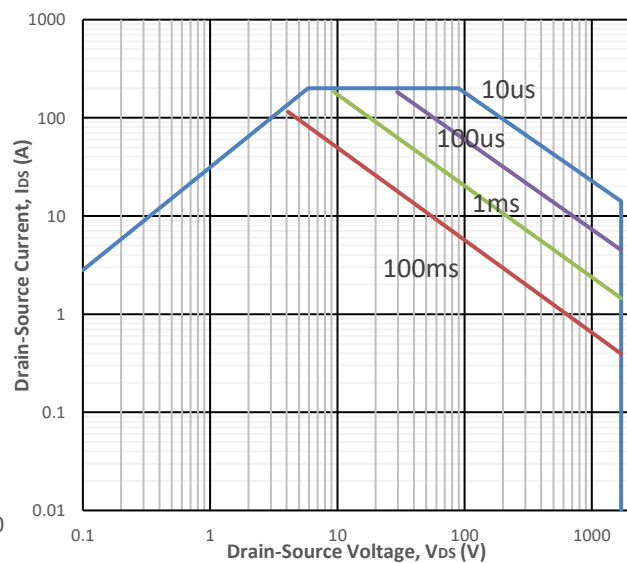
**Fig16. Switching Times vs.  $R_{G(ext)}$**



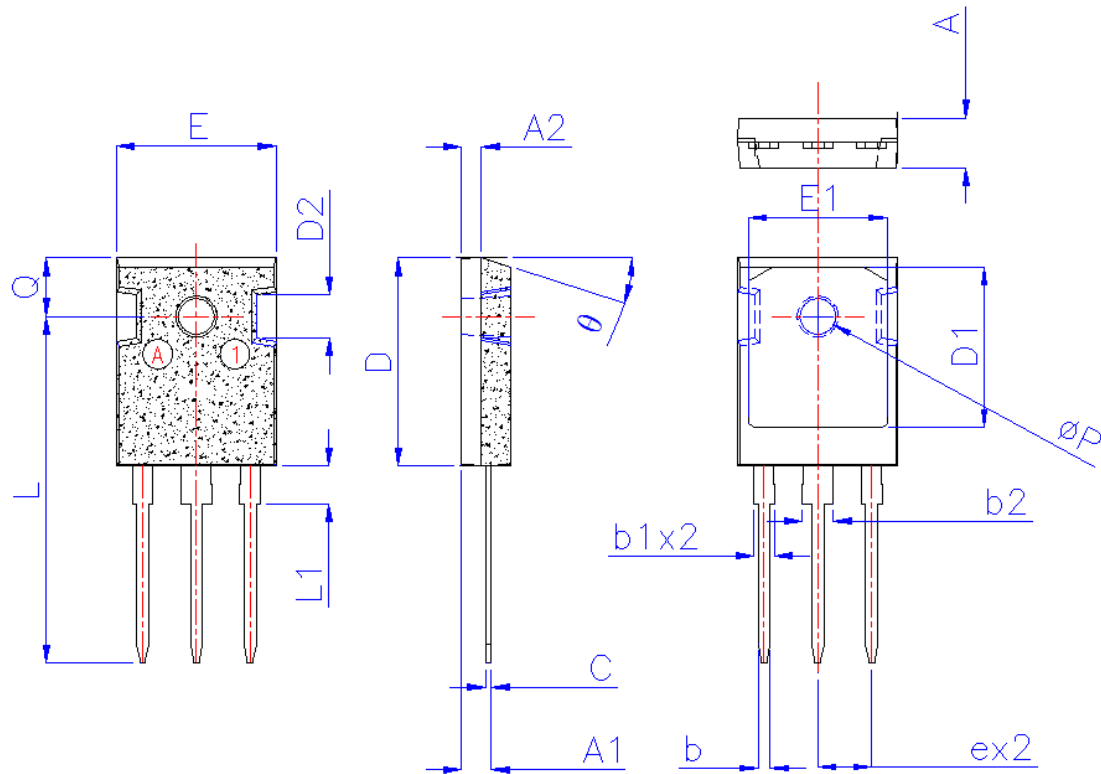
**Fig17. Transient Thermal Impedance**



**Fig18. Safe Operating Area**



### Package Drawing:



### Dimensions (UNIT: mm)

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	TYPE	MAX	MIN	TYPE	MAX
A	4.80	5.00	5.20	0.189	0.197	0.205
A1	2.85	3.00	3.15	0.112	0.118	0.124
b	1.16	1.22	1.27	0.046	0.048	0.050
b1	2.03	2.06	2.10	0.080	0.081	0.083
b2	3.03	3.06	3.10	0.119	0.120	0.122
C	0.55	0.60	0.65	0.022	0.024	0.026
D	20.80	21.00	21.20	0.819	0.827	0.835
D1	15.94	16.24	16.54	0.628	0.639	0.651
D2	4.30 BSC			0.169 BSC		
e	5.44 BSC			0.214 BSC		
E	15.95	16.15	16.35	0.628	0.636	0.644
E1	13.82	14.02	14.26	0.544	0.552	0.561
L	34.65	35.05	35.45	1.364	1.380	1.396
L1	-	-	3.86	-	-	0.152
Q	5.85	5.95	6.05	0.230	0.234	0.238
øP	3.45	3.60	3.75	0.136	0.142	0.148
θ	17.5°			0.689°		