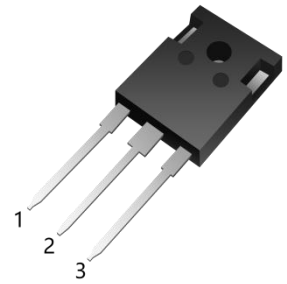
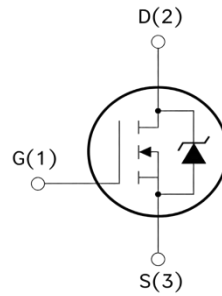


Silicon Carbide Power MOSFET

Parameter	Value	Unit
V_{DS}	750	V
I_D	54	A
$R_{DS(ON)}$	35	m Ω
Q_G	64	nC



TO-247-3L

Features

- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitances
- Avalanche Ruggedness
- Easy to Parallel and Simple to Drive

Applications

- Battery Chargers
- Motor Drives
- Pulsed Power Applications
- High Voltage DC/DC Converters
- Switched-Mode Power Supply(SMPS)

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

Parameter	Symbol	Value	Unit
Drain-source Voltage	V_{DS}	750	V
Gate-source Voltage (Absolute maximum values)	V_{GS}	-10/+22	V
Gate-source Voltage (Recommended operational values)		-4/+18	
Drain Current (continuous; $T_C=25^\circ\text{C}$); $V_{GS}=18\text{V}$	I_D	54	A
Drain Current (continuous; $T_C=100^\circ\text{C}$); $V_{GS}=18\text{V}$		36	
Drain Current (pulsed); $V_{GS}=18\text{V}$; $T_C=25^\circ\text{C}$	I_{DM}	115	A
Power Dissipation ($T_C=25^\circ\text{C}$, $T_J=175^\circ\text{C}$)	P_D	176	W
Avalanche energy, single pulse	E_{AS}	270	mJ
Avalanche Current, single pulse	I_{AS}	7.5	A
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to +175	$^\circ\text{C}$
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.86	$^\circ\text{C/W}$

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	$B_{V_{DS}}$	$V_{GS}=0V; I_D=500\mu A$	750	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=750V; V_{GS}=0V$	-	-	10	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=18V; V_{DS}=0V$	-	-	250	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}; I_{DS}=23mA; T_J=25^\circ\text{C}$	2.2	-	3.8	V
Static Drain-Source on Resistance	$R_{DS(on)}$	$V_{GS}=15V; I_D=17A; T_J=25^\circ\text{C}$	-	45		m Ω
		$V_{GS}=18V; I_D=17A; T_J=25^\circ\text{C}$	-	35	45	
		$V_{GS}=18V; I_D=17A; T_J=175^\circ\text{C}$	-	46	-	
Dynamic characteristics (at $T_C=25^\circ\text{C}$ unless otherwise specified)						
Input Capacitance	C_{iss}	$V_{DS}=500V; f=1MHz; V_{GS}=0V$ $T_J=25^\circ\text{C}$	-	1640	-	pF
Output Capacitance	C_{oss}		-	125	-	
Reverse Transfer Capacitance	C_{rss}		-	14	-	
Total Gate Charge	Q_G	$V_{DD}=500V; V_{GS}=-4/18V; I_D=27A$ $T_J=25^\circ\text{C}$	-	64	-	nC
Gate-Source Charge	Q_{GS}		-	22	-	
Gate-Drain Charge	Q_{GD}		-	16	-	
Internal Gate Resistor	R_{Gint}	$f=1MHz; V_{AC}=25mA$	-	2.1	-	Ω
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=500V; V_{GS}=-4/18V; I_D=27A;$ $R_{g(ext)}=5\Omega$	-	9.6	-	ns
Rise Time	t_r		-	28	-	
Turn-off Delay Time	$t_{d(off)}$		-	31	-	
Fall Time	t_f		-	16	-	

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}	$V_{GS}=0V; I_F=13.5A; T_J=25^\circ\text{C}$	-	2.9	-	V
Continuous Diode Forward Current	I_S	$V_{GS}=0V; T_J=25^\circ\text{C}$	-	54	-	A
Reverse Recovery Time	t_{RR}	$V_R=500V; V_{GS}=-4/18V; I_F=27A;$ $di/dt=2860A/\mu s; T_J=25^\circ\text{C}$	-	15	-	ns
Reverse Recovery Charge	Q_{RR}		-	248	-	nC
Peak Reverse Recovery Current	I_{RRM}		-	26	-	A

Typical Characteristics

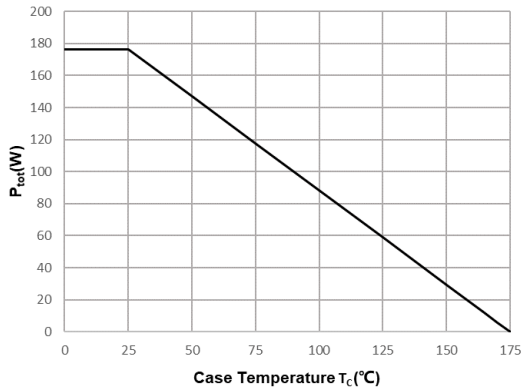


Fig1. Power Dissipation vs. Case Temperature

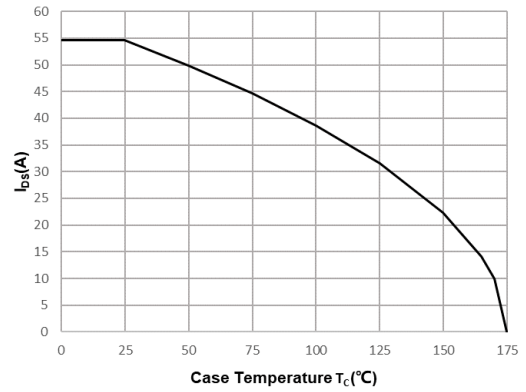


Fig2. Maximum DC Drain to Source Current vs. Case Temperature

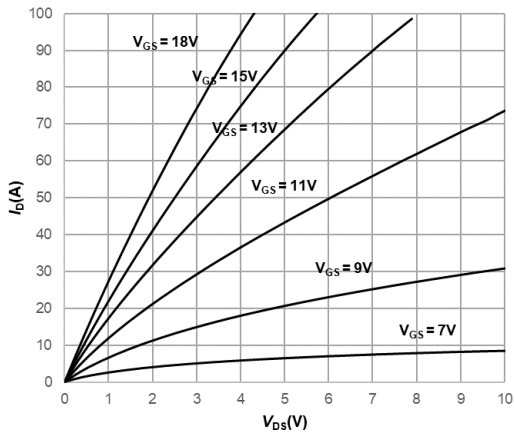


Fig3. Output Characteristics $T_j=25^\circ\text{C}$

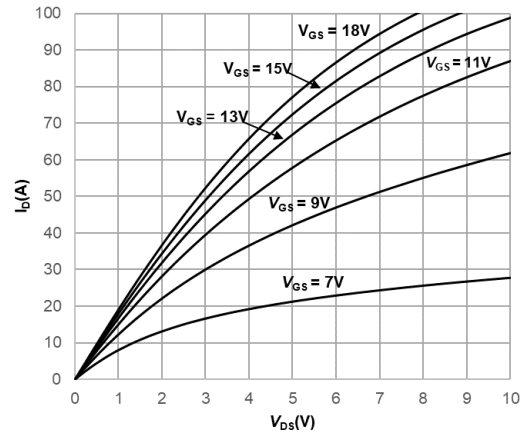


Fig4. Output Characteristics $T_j=175^\circ\text{C}$

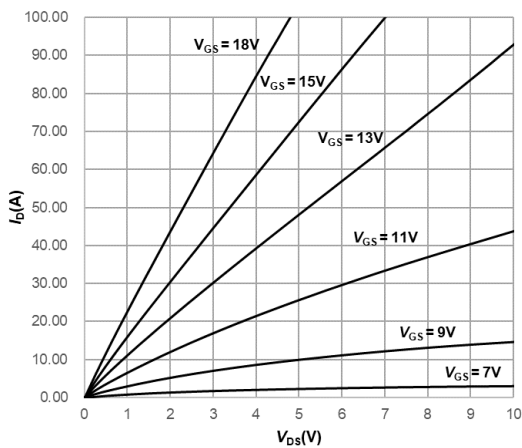


Fig5. Output Characteristics $T_j=-40^\circ\text{C}$

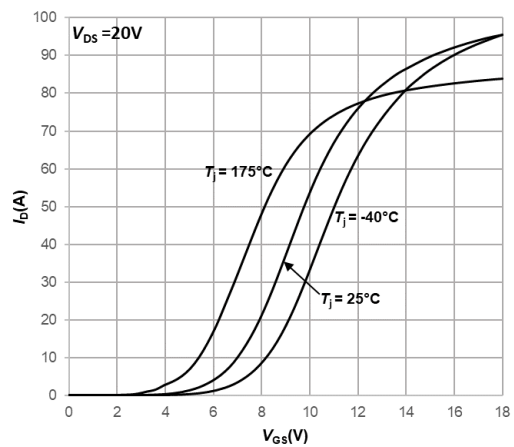


Fig6. Typical Transfer Characteristics

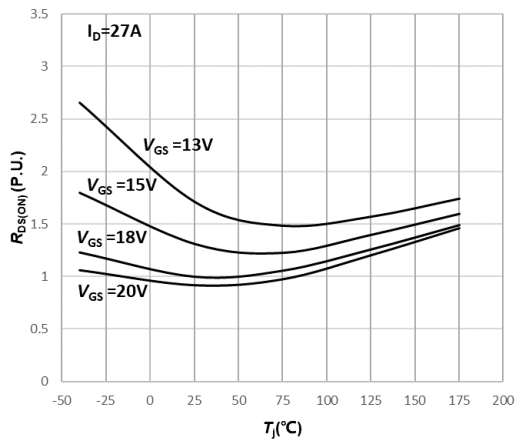


Fig7. Normalized On-Resistance vs. Temperature For Various V_{GS}

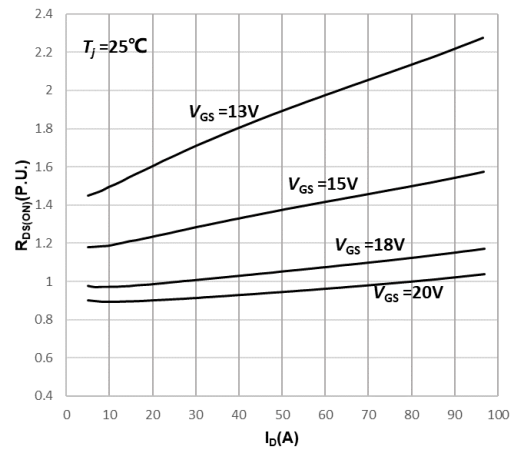


Fig8. Normalized On-Resistance vs. Drain Current For Various V_{GS}

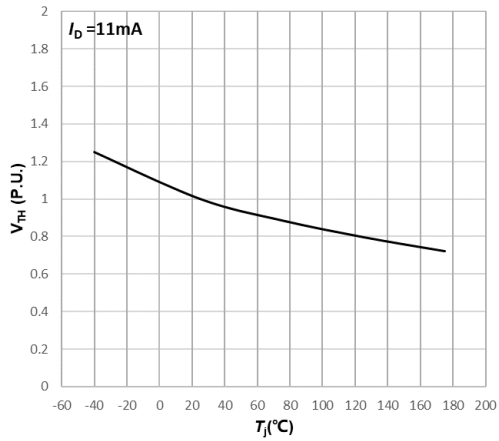


Fig9. Body Diode Characteristics

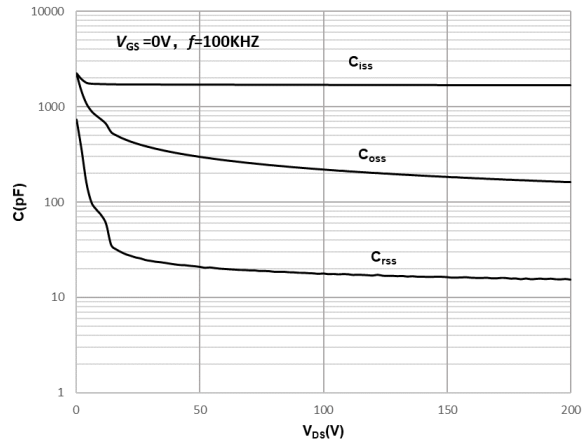


Fig10. Capacitances vs. Drain-Source Voltage (0-200V)

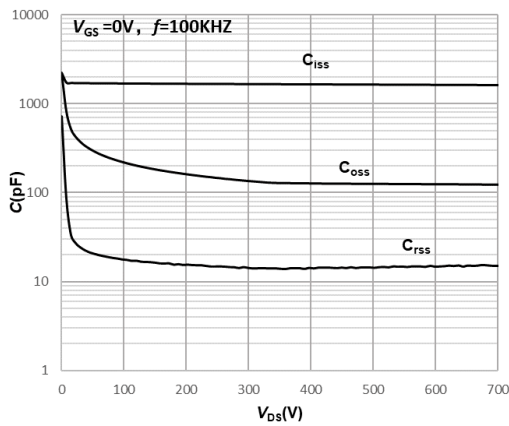


Fig11. Capacitances vs. Drain-Source Voltage (0-700V)

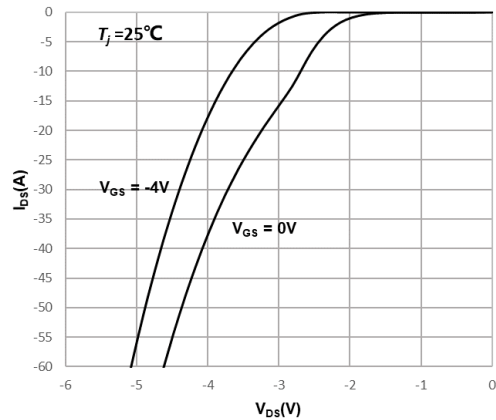


Fig12. Body Diode Characteristics

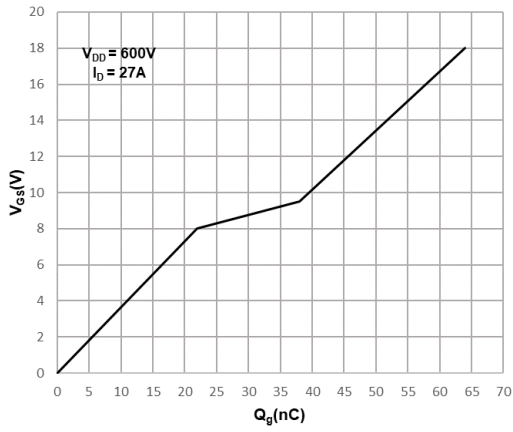
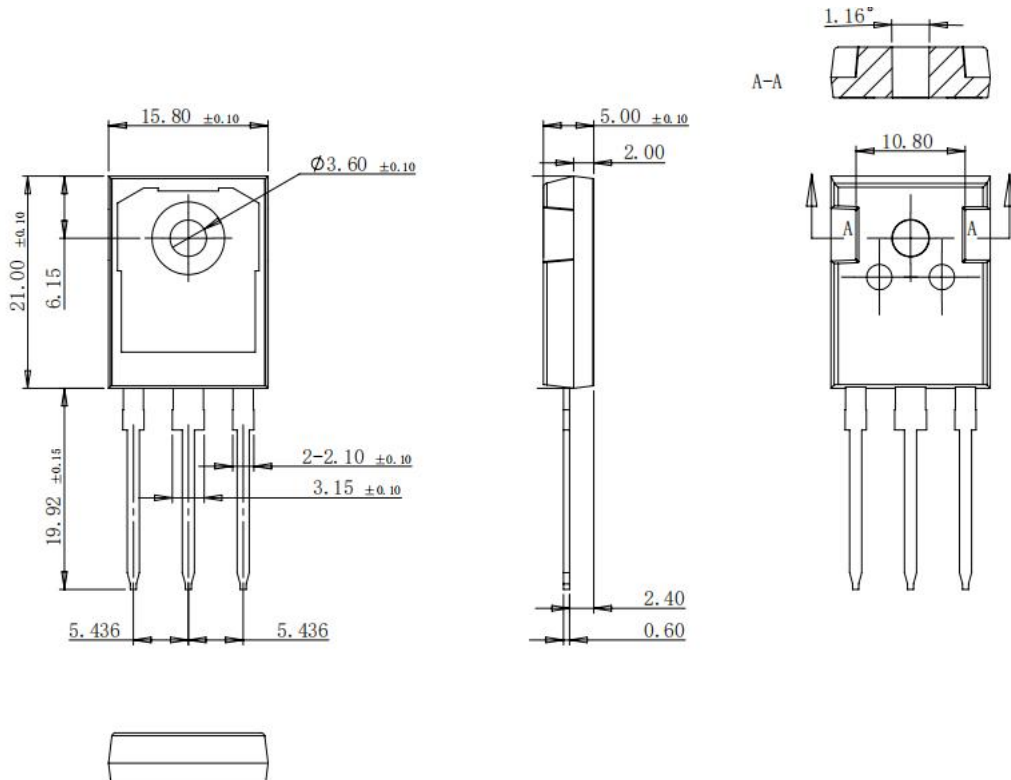


Fig13. Typical Gate Charge

Package Outlines(Unit:mm)

TO-247-3L



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