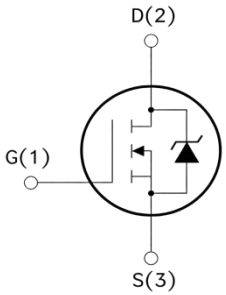
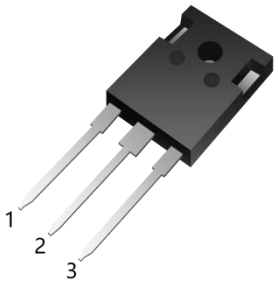
Silicon Carbide Power MOSFET

Parameter	Value	Unit
V_{DS}	1200	V
I_D	68	A
$R_{DS(ON)}$	40	mΩ
Q_G	80	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

- EV Charging
- High Voltage DC/DC Converters
- Switched-Mode Power Supply(SMPS)
- Power Factor Correction(PFC)

Absolute Maximum Ratings (at T_J=25℃ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-source Voltage	V_{DS}	1200	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°C) ; V_{GS}=18V	I_D	68	A
Drain Current (continuous;T_C=100°C); V_{GS}=18V		59	
Drain Current (pulsed); V_{GS}=18V; T_C=25°C	I_{DM}	135	A
Power Dissipation (T_C=25°C, T_J=175°C)	P_D	283	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to +175	°C
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.53	°C/W

Electrical Characteristics

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Static characteristics (at T_C=25°C unless otherwise specified)						
Drain-Source Breakdown Voltage	B_{VDS}	V_{GS}=0V; I_D=500uA	1200	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=1200V; V_{GS}=0V	-	-	10	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=18V; V_{DS}=0V	-	-	100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}; I_{DS}=9mA; T_J=25°C	2.0	-	4.0	V
Static Drain-Source on Resistance	$R_{DS(on)}$	V_{GS}=18V; I_D=40A; T_J=25°C	-	40	52	mΩ
		V_{GS}=18V; I_D=40A; T_J=175°C	-	62	-	
Dynamic characteristics (at T_C=25°C unless otherwise specified)						
Input Capacitance	C_{iss}	V_{DS}=800V; f=1MHz; V_{GS}=0V T_j=25°C	-	1860	-	pF
Output Capacitance	C_{oss}		-	75	-	
Reverse Transfer Capacitance	C_{rss}		-	7	-	
Total Gate Charge	Q_G	V_{DD}=800V; V_{GS}=-4/18V; I_D=40A T_j=25°C	-	80	-	nC
Gate-Source Charge	Q_{GS}		-	3	-	
Gate-Drain Charge	Q_{GD}		-	13	-	
Internal Gate Resistor	R_{Gint}	f=1MHz; V_{AC}=25mA	-	2.0	-	Ω
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=800V; V_{GS}=-4/18V; I_D=40A; $R_{g(ext)}$=10Ω	-	13	-	ns
Rise Time	t_r		-	84	-	
Turn-off Delay Time	$t_{d(off)}$		-	36	-	
Fall Time	t_f		-	28	-	
Turn-On Energy	E_{on}			265		μJ
Turn-Off Energy	E_{off}			45		

Reverse SiC Diode Characteristics(at T_J=25℃ unless otherwise specified)

Parameter	Symbol	Conditions	Values			Units
			Min.	Typ.	Max.	
Diode Forward Voltage	V_{FSD}	V_{GS}=-4V; I_F=20A; T_J=25°C	-	4.5	-	V
Continuous Diode Forward Current	I_S	V_{GS}=-4V; T_j=25°C	-	68	-	A
Reverse Recovery Time	t_{RR}	V_R=800V; V_{GS}=-4V; I_F=40A; di/dt=800A/μs, T_j=25°C	-	28	-	ns
Reverse Recovery Charge	Q_{RR}		-	85	-	nC
Peak Reverse Recovery Current	I_{RRM}		-	5.3	-	A

Typical Characteristics

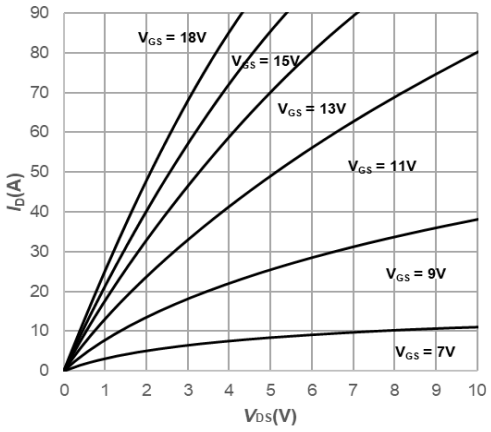


Fig1. Output Characteristics T_j=25℃

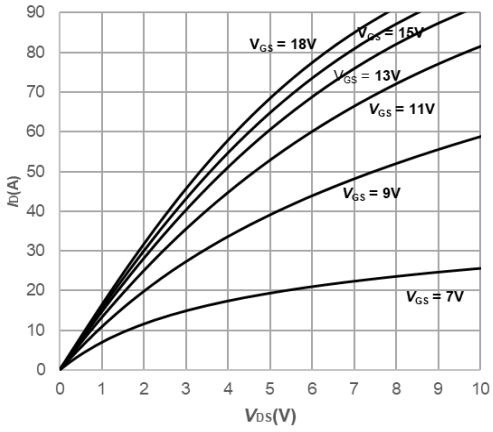


Fig2. Output Characteristics T_j=175℃

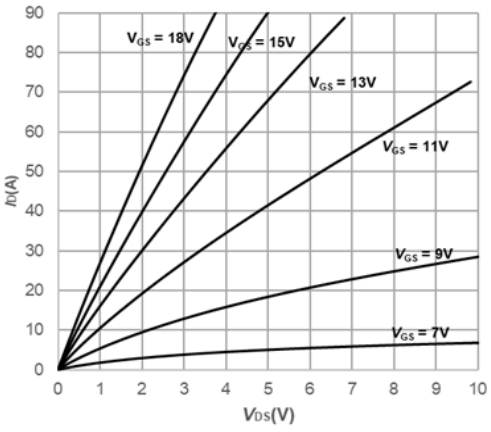


Fig3. Output Characteristics T_j=-55℃

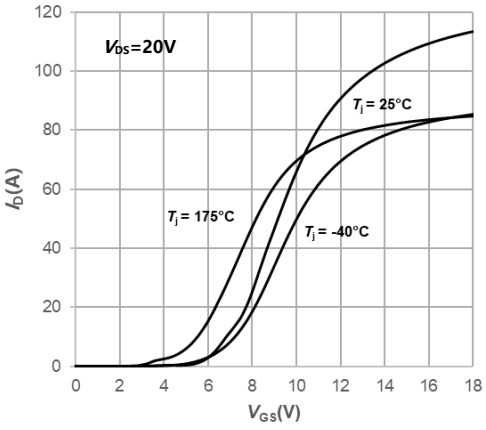


Fig4. Typical Transfer Characteristics

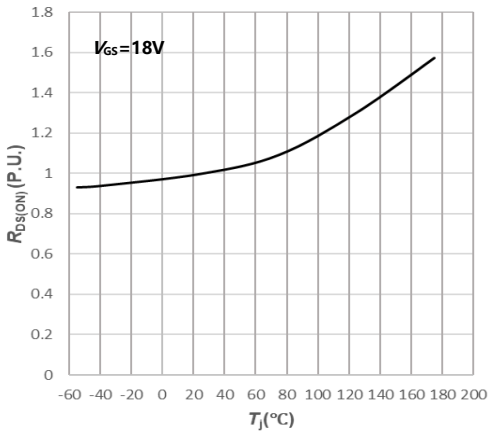


Fig5. Normalized On-Resistance vs. Temperature

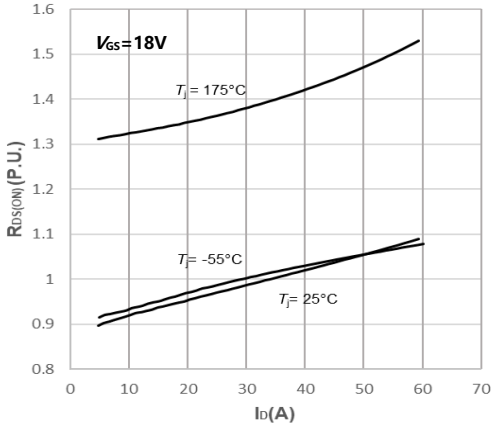


Fig6. Normalized On-Resistance vs. Drain Current for Various Temperatures

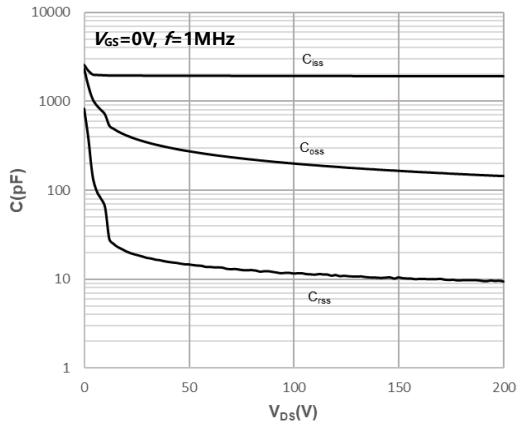


Fig7. Capacitances vs. Drain-Source Voltage (0-200V)

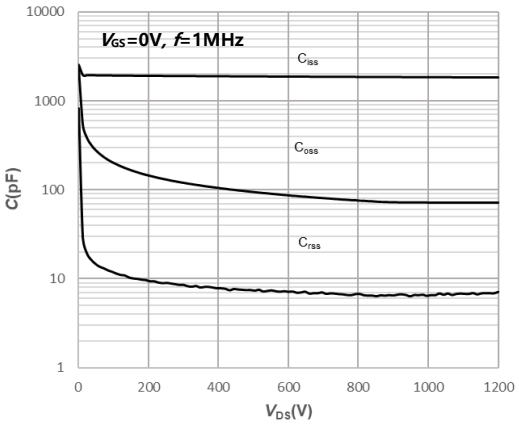


Fig8. Capacitances vs. Drain-Source Voltage (0-1200V)

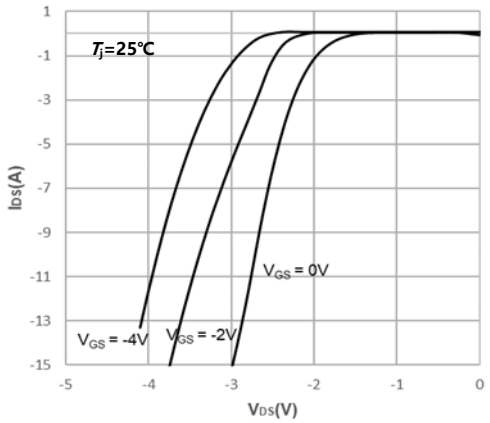


Fig9. Body Diode Characteristics

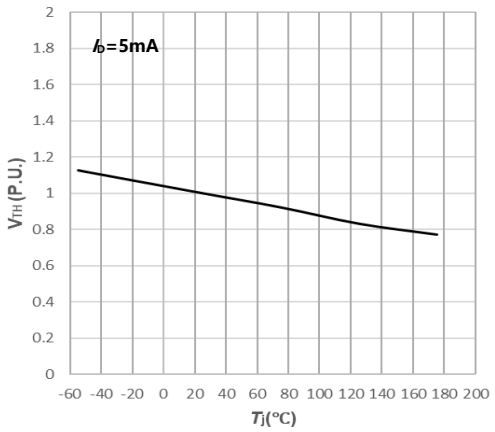


Fig10. Normalized Threshold Voltage vs. Temperature

Package Outlines(Unit:mm)

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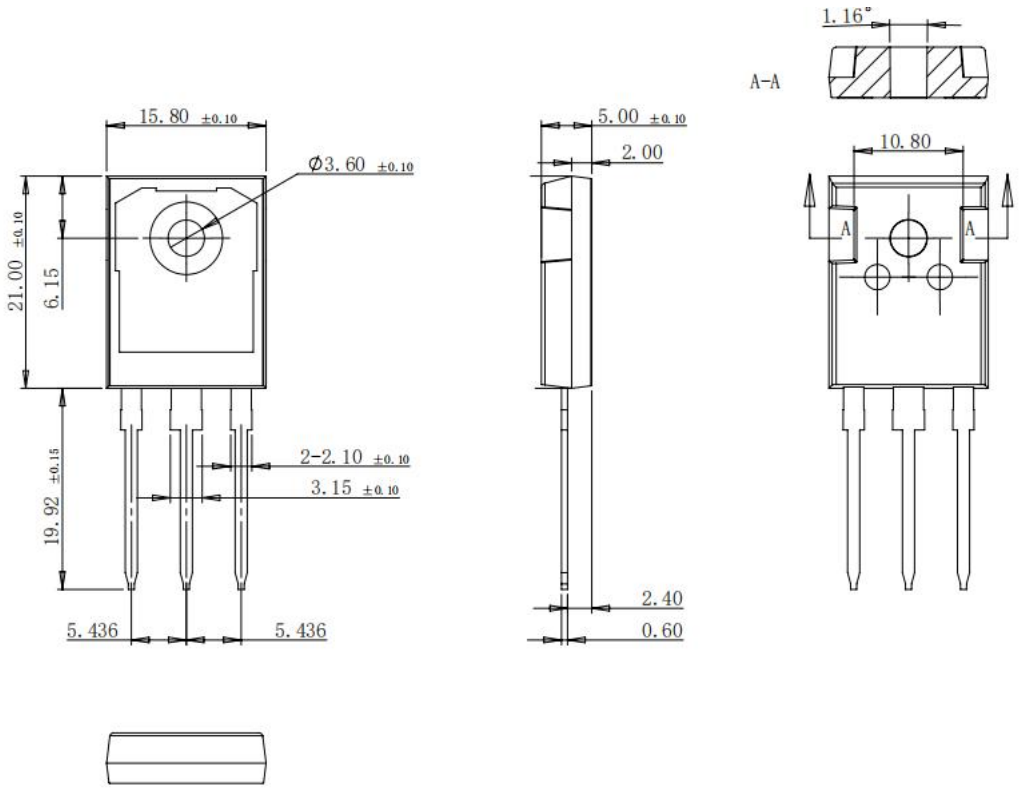

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