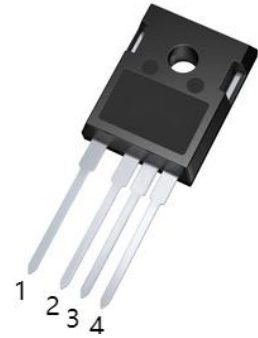
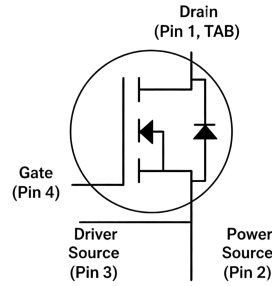


## Silicon Carbide Power MOSFET

Parameter	Value	Unit
$V_{DS}$	1200	V
$I_D$	36	A
$R_{DS(ON)}$	80	m $\Omega$
$Q_G$	51	nC



TO-247-4L

### 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

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

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

Parameter	Symbol	Conditions	Value	Unit
Drain-source Voltage	$V_{DS}$	$V_{GS}=0V$	1200	V
Gate-source Voltage	$V_{GS}$	Absolute maximum values	-10/+22	V
	$V_{GSop}$	Recommended operational values	-4/+18	
Drain Current (continuous)	$I_D$	$V_{GS}=15V; T_C=25^\circ\text{C}$	36	A
		$V_{GS}=15V; T_C=100^\circ\text{C}$	25	
Drain Current (pulsed)	$I_{DM}$	$V_{GS}=15V; T_C=25^\circ\text{C}$	80	A
Power Dissipation	$P_D$	$T_C=25^\circ\text{C}; T_J=175^\circ\text{C}$	283	W
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-	-55 to +175	$^\circ\text{C}$
Thermal Resistance from Junction to Case	$R_{\theta JC}$	-	0.529	$^\circ\text{C/W}$

**Electrical Characteristics**

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
<b>Static characteristics</b> (at $T_C=25^\circ\text{C}$ unless otherwise specified)						
Drain-Source Breakdown Voltage	$B_{V_{DS}}$	$V_{GS}=0V; I_D=500\mu A$	1200	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}; I_{DS}=5mA; T_J=25^\circ\text{C}$	2	-	4	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=1200V; V_{GS}=0V$	-	-	10	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=18V; V_{DS}=0V$	-	-	100	nA
Static Drain-Source on Resistance	$R_{DS(on)}$	$V_{GS}=18V; I_D=20A$	-	80	104	m $\Omega$
		$V_{GS}=18V; I_D=20A; T_J=175^\circ\text{C}$	-	122	-	
<b>Dynamic characteristics</b> (at $T_C=25^\circ\text{C}$ unless otherwise specified)						
Input Capacitance	$C_{iss}$	$V_{DS}=800V; f=1MHz; V_{GS}=0V; T_J=25^\circ\text{C}$	-	944	-	pF
Output Capacitance	$C_{oss}$		-	42.6	-	
Reverse Transfer Capacitance	$C_{rss}$		-	4.1	-	
Total Gate Charge	$Q_G$	$V_{DS}=800V; V_{GS}=-4/+18V; I_D=20A; T_J=25^\circ\text{C}$	-	51	-	nC
Gate-Source Charge	$Q_{GS}$		-	13	-	
Gate-Drain Charge	$Q_{GD}$		-	25	-	
Gate Resistor	$R_G$	$f=1MHz; V_{AC}=25mV$	-	4	-	$\Omega$
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=800V; V_{GS}=-4/+18V; I_D=20A; R_{g(ext)}=10\Omega$	-	38	-	ns
Rise Time	$t_r$		-	46	-	
Turn-off Delay Time	$t_{d(off)}$		-	32	-	
Fall Time	$t_f$		-	41	-	
Turn-on Energy	$E_{on}$		-	108	-	uJ
Turn-off Energy	$E_{off}$		-	49	-	

**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	$V_{FSD}$	$V_{GS}=-4V; I_F=10A; T_J=25^\circ\text{C}$	-	4.5	-	V
Continuous Diode Forward Current	$I_S$	$V_{GS}=-4V; T_J=25^\circ\text{C}$	-	36	-	A
Reverse Recovery Time	$t_{RR}$	$V_R=800V; V_{GS}=-4V; I_F=20A; di/dt=800A/\mu s; T_J=25^\circ\text{C}$	-	17.5	-	ns
Reverse Recovery Charge	$Q_{RR}$		-	71.4	-	nC
Peak Reverse Recovery Current	$I_{RRM}$		-	6.8	-	A

**Typical Characteristics**

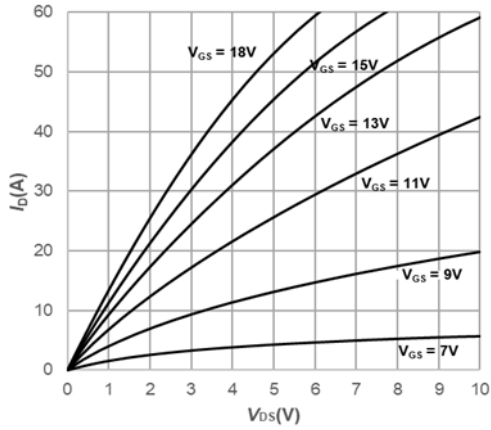


Fig1. Output Characteristics  $T_j=25^\circ\text{C}$

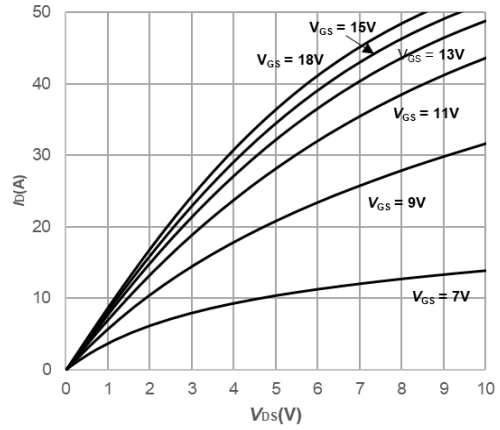


Fig2. Output Characteristics  $T_j=175^\circ\text{C}$

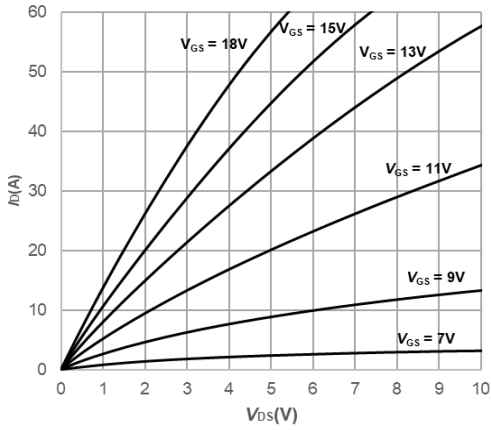


Fig3. Output Characteristics  $T_j=-55^\circ\text{C}$

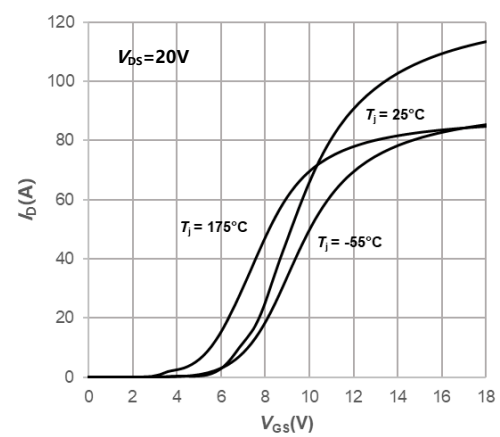


Fig4. Typical Transfer Characteristics

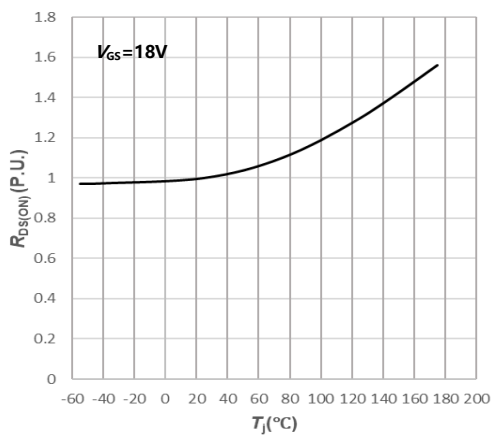


Fig5. Normalized On-Resistance vs. Temperature

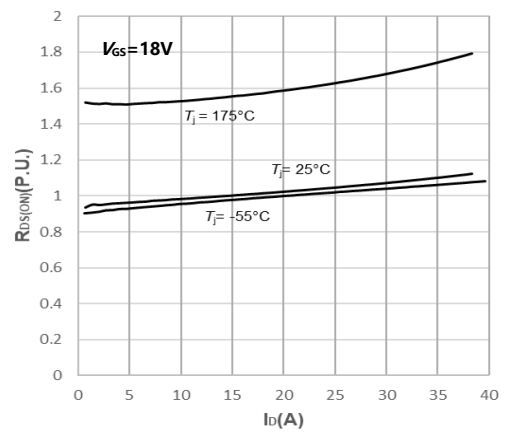


Fig6. Normalized On-Resistance vs. Drain Current for Various Temperatures

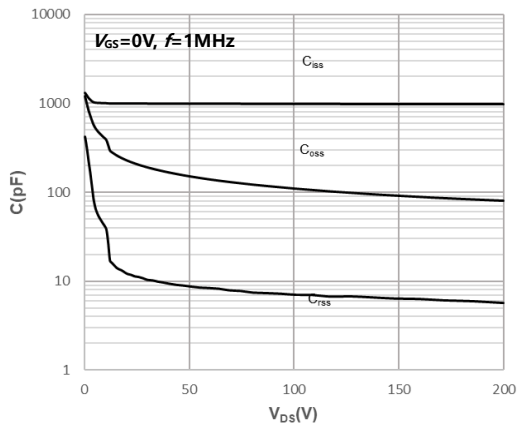


Fig7. Capacitances vs. Drain-Source Voltage (0-200V)

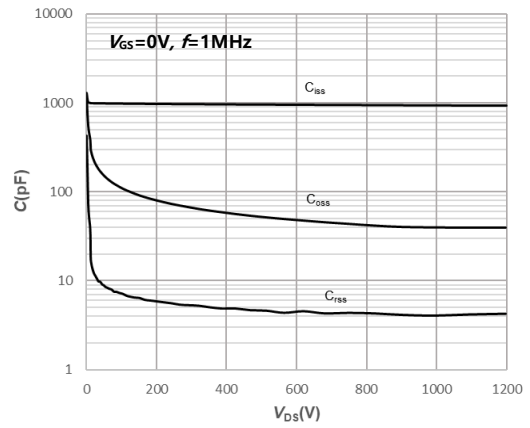


Fig8. Capacitances vs. Drain-Source Voltage (0-1200V)

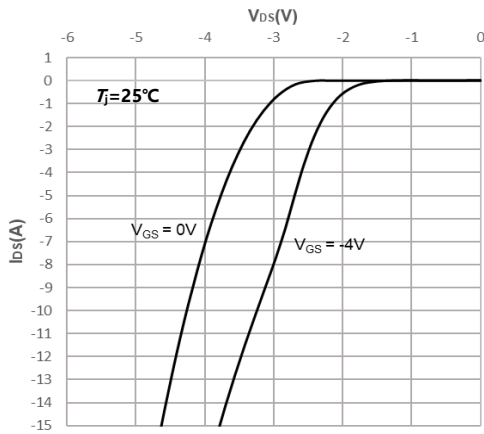


Fig9. Body Diode Characteristics

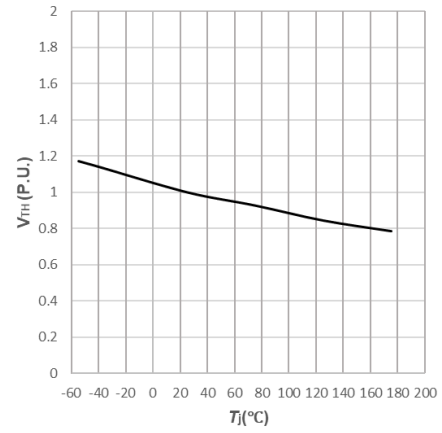


Fig10. Normalized Threshold Voltage vs. Temperature

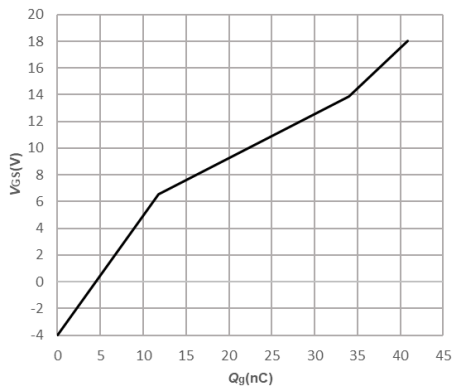


Fig11. Gate Charge Characteristics

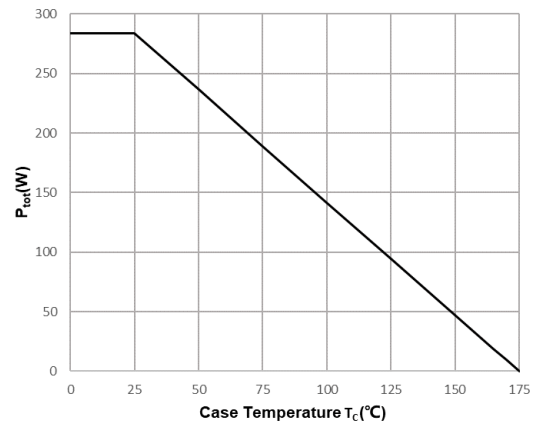


Fig12. Power Dissipation vs. Case Temperature

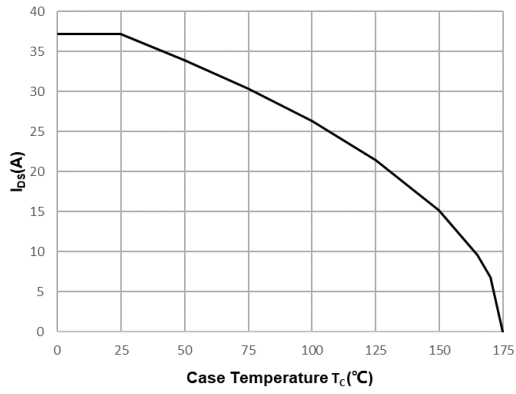
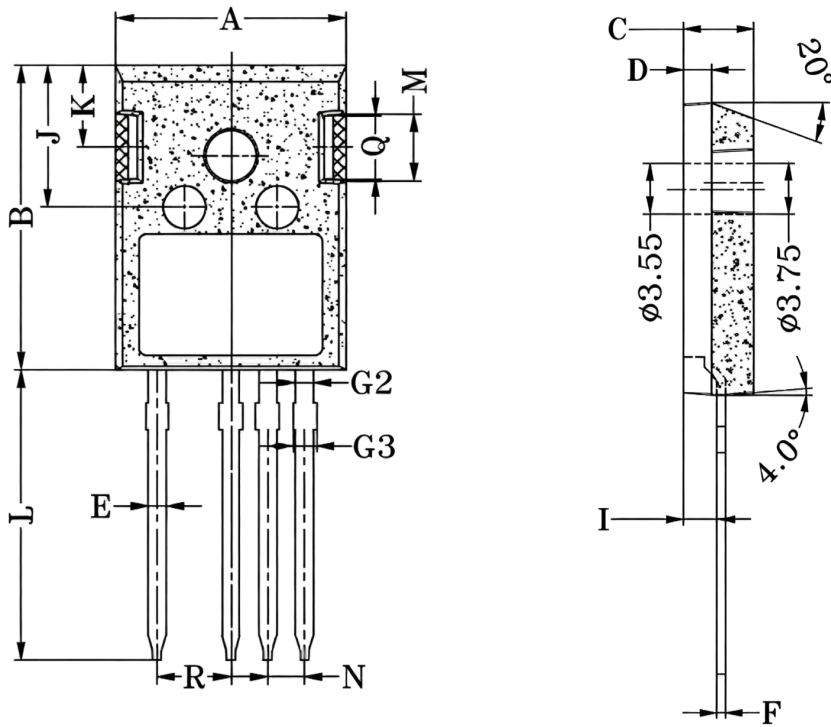
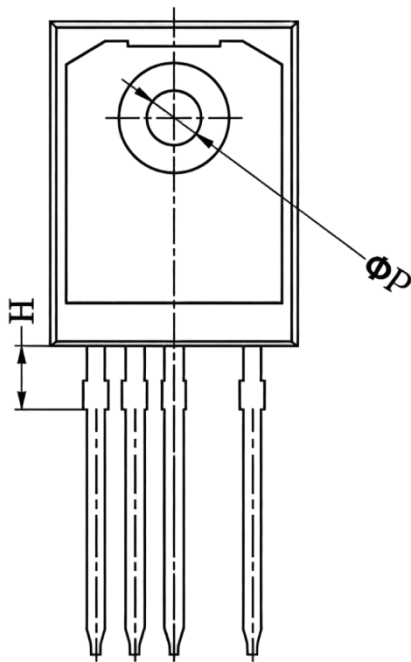


Fig13. Maximum DC Drain to Source Current vs. Case Temperature

**Package Outlines(Unit:mm)**

TO-247-4L





Symbol	Dimensions in Millimeter	
	MIN	MAX
A	15.80	16.00
B	20.90	21.10
C	4.90	5.10
D	1.90	2.10
E	1.10	1.30
F	0.50	0.70
G2	1.10	1.30
G3	1.18	1.38
H	4.18	4.38
I	2.30	2.50
J	9.65	9.85
K	5.54	5.74
L	19.80	20.20
M	4.50	4.70
N	2.34	2.74
Ø P	3.40	3.60
Q	4.232	4.432
R	4.88	5.28

**\*Important Usage Information and Disclaimer**

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