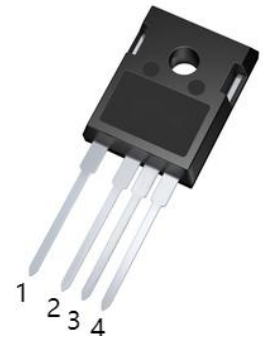
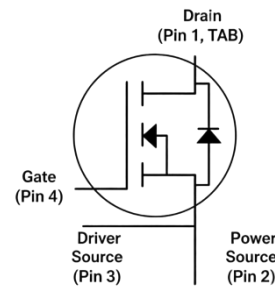


**Silicon Carbide Power MOSFET**

Parameter	Value	Unit
$V_{DS}$	1200	V
$I_D$	68	A
$R_{DS(on)}$	40	m $\Omega$
$Q_G$	80	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**

- Power Factor Correction Modules
- Switch Mode Power Supplies
- DC-AC Inverters
- High Voltage DC/DC Converters

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

Parameter	Symbol	Test Condition	Value	Unit
Drain to Source Voltage	$V_{DS}$	$V_{GS}=0V, I_D=100\mu A$	1200	V
Gate to Source Voltage	$V_{GS}$	Absolute maximum values	-10/+22	V
Recommended Operation Voltage of Gate to Source	$V_{GSop}$	Recommended operational values	-4/+18	V
Continuous Drain Current	$I_D$	$V_{GS}=18V, T_C=25^\circ\text{C}$	68	A
		$V_{GS}=18V, T_C=100^\circ\text{C}$	59	
Pulsed Drain Current	$I_{DM}$	Pulse with $T_p$ limited by $T_{jmax}$	135	A
Power Dissipation	$P_{tot}$	$T_C=25^\circ\text{C}, T_j=175^\circ\text{C}$	283	W
Operating and Storage Temperature	$T_j, T_{stg}$		-55 to +175	$^\circ\text{C}$

**Thermal Characteristics**

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Thermal Resistance from Junction to Case	$R_{th(j-c)}$	-	0.529	-	$^\circ\text{C/W}$

**Electrical Characteristics**  
**Static Characteristics**

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=500\mu A$	1200			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=9mA, T_j=25^\circ C$	2		4	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{GS}=0V, V_{DS}=1200V$			10	$\mu A$
Gate to Source Leakage Current	$I_{GSS}$	$V_{GS}=18V, V_{DS}=0V$			100	nA
Drain to Source on Resistance	$R_{DS(on)}$	$V_{GS}=18V, I_D=40A$		40	52	m $\Omega$
		$V_{GS}=18V, I_D=40A, T_j=175^\circ C$		62		

**Dynamic Characteristics**

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=800V,$ $f=1MHz,$ $T_j=25^\circ C$		1860		pF
Output Capacitance	$C_{oss}$			75		
Reverse Transfer Capacitance	$C_{rss}$			7		
Total Gate Charge	$Q_g$	$V_{GS}=-4/18V, V_{DS}=800V,$ $I_D=40A, T_j=25^\circ C$		80		nC
Gate-Source Charge	$Q_{gs}$			3		
Gate-Drain Charge	$Q_{gd}$			13		
Gate Resistance	$R_g$	$V_{AC}=25mV, f=1MHz$		2		$\Omega$

**Switching Characteristics**

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=-4/18V, V_{DD}=800V,$ $I_D=40A, R_g=10\Omega$		13		ns
Rise Time	$t_r$			30		
Turn-Off Delay Time	$t_{d(off)}$			35		
Fall Time	$t_f$			10		
Turn-On Energy	$E_{on}$			265		$\mu J$
Turn-Off Energy	$E_{off}$			45		

**Reverse Diode Characteristics**

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Diode Forward Voltage	$V_{SD}$	$V_{GS}=-4V, I_{SD}=20A, T_j=25^\circ C$	-	4.5		V
Continuous Diode Forward Current	$I_S$	$V_{GS}=-4V, T_j=25^\circ C$		68		A
Reverse Recovery Time	$t_{rr}$	$V_{GS}=-4V, I_{SD}=40A,$		28		ns
Reverse Recovery Charge	$Q_{rr}$	$V_R=800V, di/dt=800A/us,$		83		nC
Peak Reverse Recovery Current	$I_{rrm}$	$T_j=25^\circ C$		5.3		A

**Typical Characteristics**

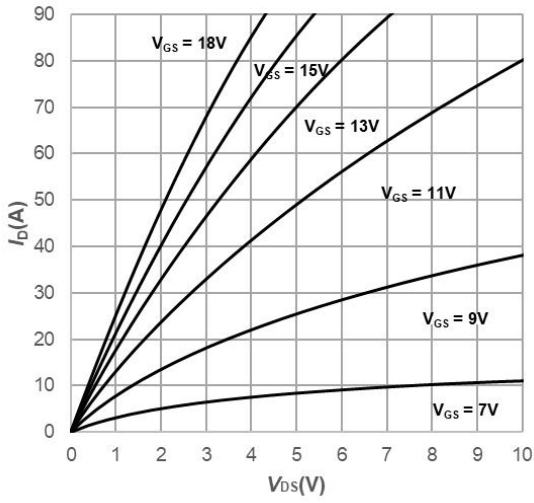


Fig 1. Output Characteristics  $T_j = 25^\circ\text{C}$

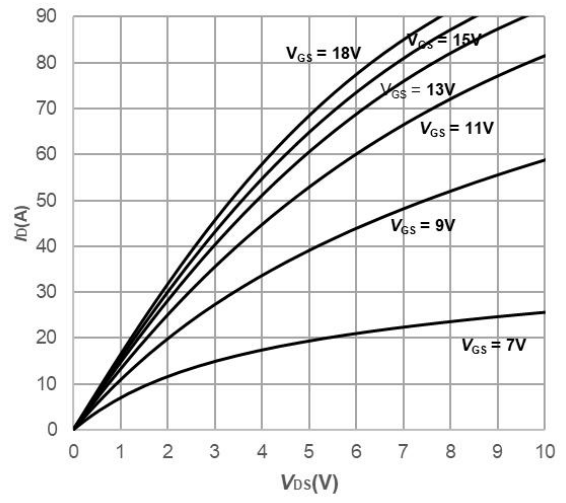


Fig 2. Output Characteristics  $T_j = 175^\circ\text{C}$

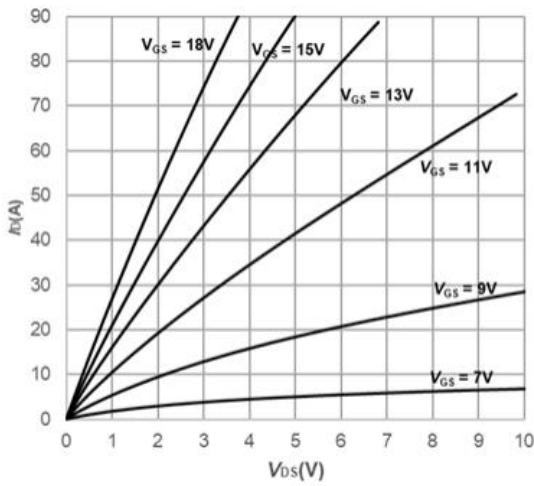


Fig 3. Output Characteristics  $T_j = -55^\circ\text{C}$

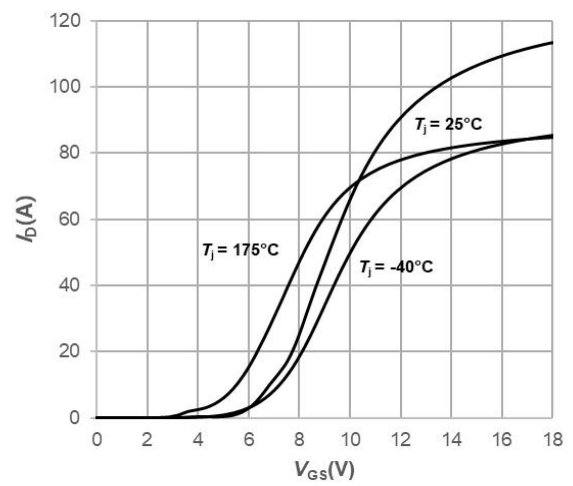


Fig 4. Typical Transfer Characteristics  $V_{DS} = 20\text{V}$

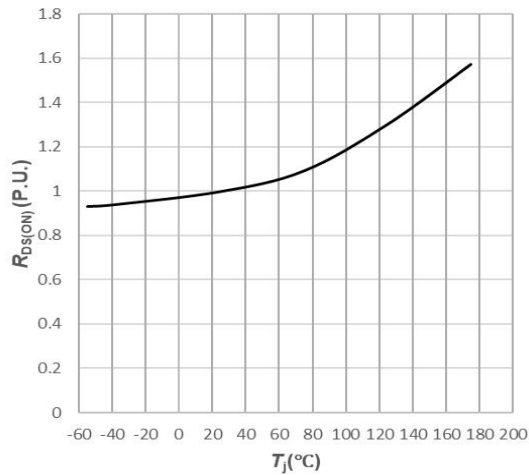


Fig 5. Normalized On-Resistance vs. Temperature  $V_{GS} = 18\text{V}$

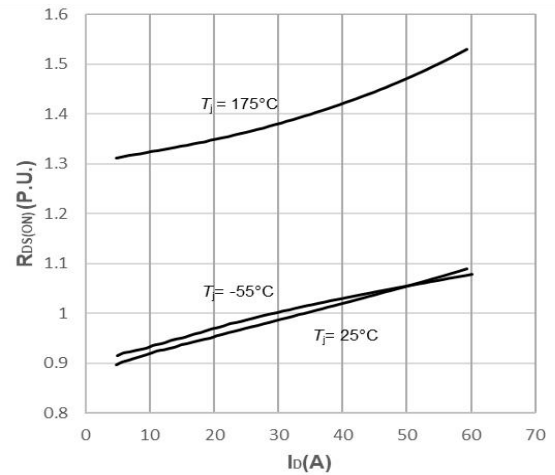


Fig 6. Normalized On-Resistance vs. Drain Current for Various Temperatures  $V_{GS} = 18\text{V}$

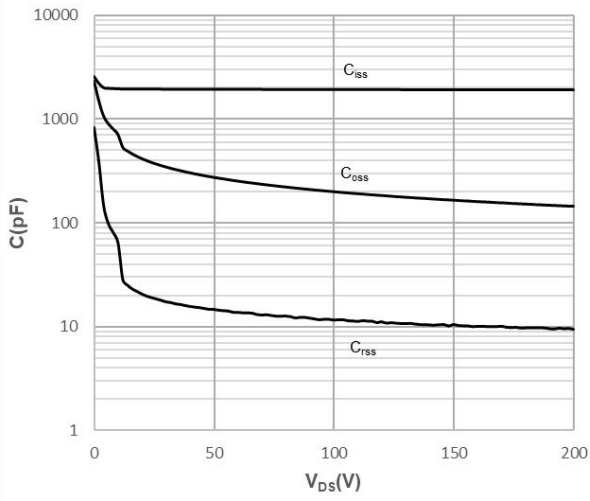


Fig 7. Capacitances vs. Drain-Source Voltage (0-200V) V<sub>GS</sub>=0V, f=1MHz

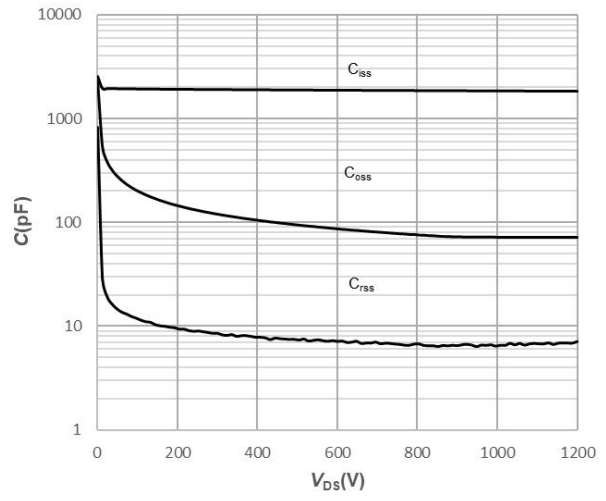


Fig 8. Capacitances vs. Drain-Source Voltage (0-1200V) V<sub>GS</sub>=0V, f=1MHz

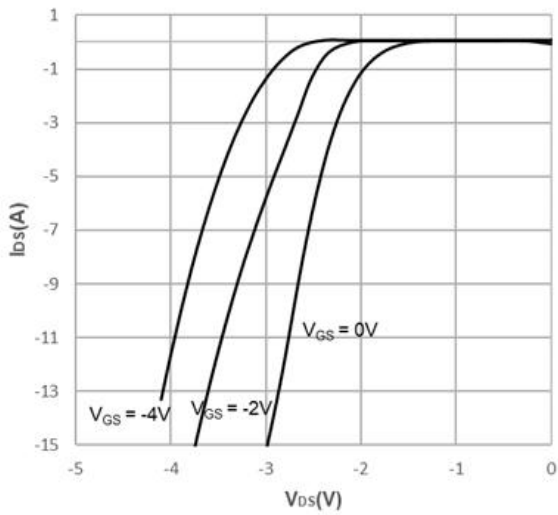


Fig 9. Body Diode Characteristics T<sub>j</sub>=25°C

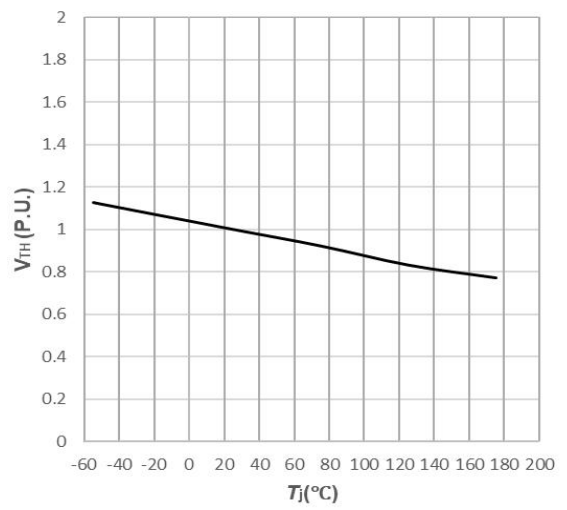
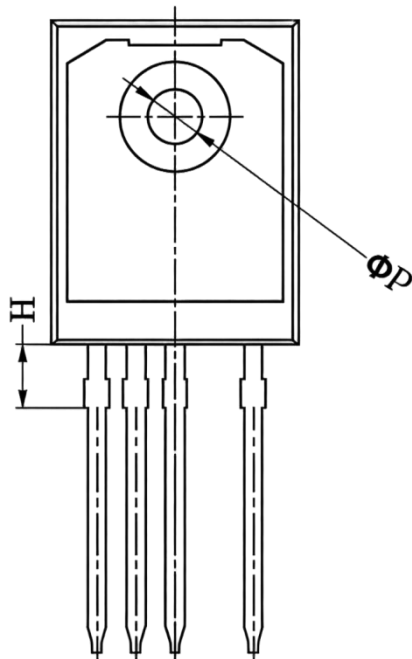
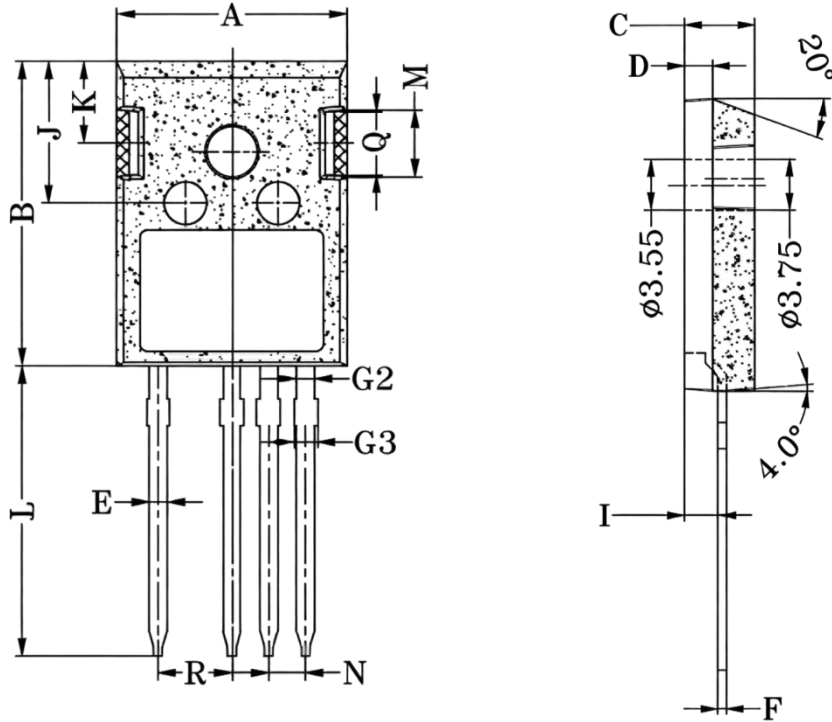


Fig 10. Normalized Threshold Voltage vs. Temperature I<sub>D</sub>=5mA

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
$\phi P$	3.40	3.60
Q	4.232	4.432
R	4.88	5.28

**\*Important Usage Information and Disclaimer**

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