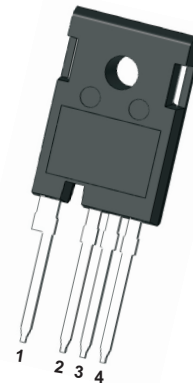




## N-Channel SiC Power MOSFET

TO-247-4L(\*Prefix :W)

$V_{DS}$	1200V
$I_D@25^{\circ}C$	60A
$R_{DS(on)}$	40 m $\Omega$



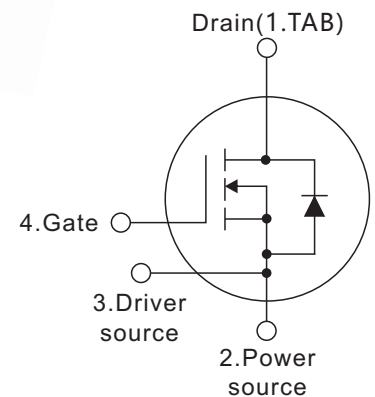
### DESCRIPTION

- 8mm Of Creepage Distance Between Drain And Source
- 3rd Generation Sic Mosfet Technology
- High Blocking Voltage With Low On-resistance
- High-speed Switching With Low Capacitances
- Halogen Free, Rohs Compliant.

### Features

- Reduce switching losses and minimize gate ringing
- Higher system efficiency
- Reduce cooling requirements
- Increase power density
- Increase system switching frequency

### SYMBOL



### ABSOLUTE MAXIMUM RATINGS (TA=25°C, unless otherwise specified)

PARAMETER	Symbols	RATINGS	Test Conditions	Units
Drain-Source Voltage	$V_{DSS}$	1200	$V_{GS}=0V, I_D=100\mu A$	V
Gate-Source Voltage	$V_{GS}$	-8/+22	Absolute maximum values	V
Continuous Drain Current	$I_D$	60	$V_{GS}=18V, T_c=25^{\circ}C$	A
Continuous Drain Current	$I_D$	40	$V_{GS}=18V, T_c=100^{\circ}C$	A
Pulsed Drain Current (Note 1)	$I_{D(Pulse)}$	100	Pulse width $t_p$ limited by $T_{jmax}$	A
Power Dissipation	$P_D$	136	$T_c=25^{\circ}C$	W
Operating junction and storage temperature	$T_j, T_{stg}$	-55 ~ +175		$^{\circ}C$

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

### Thermal Resistance

PARAMETER	Symbols	RATINGS	Units
Thermal resistance, junction – case.	$R_{thJC}$	1.1	$^{\circ}C/W$
Thermal resistance, junction – ambient(min. footprint)	$R_{thJA}$	45	$^{\circ}C/W$



ELECTRICAL CHARACTERISTICS (TA=25°C, unless otherwise specified)

PARAMETER	Symbols	TEST CONDITIONS	Min	Typ	Max	Units
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=100\mu A$	1200			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=1200V, V_{GS}=0V$			100	uA
		$V_{DS}=1200V, V_{GS}=0V, T_j=175^\circ C$			500	
Gate- Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=18V$			200	nA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=10mA$	2.0	3.2	4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=18V, I_D=33A, T_j=25^\circ C$		40	50	mΩ
		$V_{GS}=18V, I_D=33A, T_j=175^\circ C$		60		
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0V, V_{DS}=1000V$		2900		pF
Output Capacitance	$C_{OSS}$	$f=1MHz$		118		pF
Reverse Transfer Capacitance	$C_{RSS}$	$V_{AC}=25mV$		11.6		pF
Gate resistance	$R_G$	$f=1MHz, V_{AC}=25mV$		2.1		Ω
Transconductance $T_c=25^\circ C$	$g_{fs}$	$V_{DS}=20V, I_D=33A$		20		S
Turn-On Energy ( Body Diode )	$E_{ON}$	$V_{DS}=800V, V_{GS}=-5/18V,$		1.2		mJ
Turn-Off Energy ( Body Diode )	$E_{OFF}$	$I_D=33A, L=80\mu H$		0.44		mJ
Total Gate Charge (Note 1)	$Q_G$	$V_{DS}=800V$		128		nC
Gate-Source Charge	$Q_{GS}$	$V_{GS}=-5V/18V$		40		nC
Gate-Drain Charge	$Q_{GD}$	$I_D=33A$		37		nC
Turn-On Delay Time (Note 1)	$t_{D(ON)}$	$V_{DS}=800V, V_{GS}=-5/18V,$		60		ns
Turn-On Rise Time	$t_R$	$I_D=33A, R_G=2.5\Omega$		140		ns
Turn-Off Delay Time	$t_{D(OFF)}$	Timing relative to $V_{DS}$		50		ns
Turn-Off Fall Time	$t_F$			42		ns
<b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b>						
Maximum Body-Diode Continuous Current	$I_S$	$T_j=25^\circ C$			60	A
Drain-Source Diode Forward Voltage (Note 1)	$V_{SD}$	$I_{SD}=20A, V_{GS}=-5V$		3.6		V
Reverse Recovery Time (Note 1)	$t_{rr}$	$I_F=33A, V_{GS}=-5V, di/dt$		37		ns
Reverse Recovery Charge	$Q_{rr}$	$=1200A/\mu s, V_R=800V$		165		uC

Notes:

1. Pulse Test: Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .



### Typical Characteristics

Fig.1 Typical forward Output characteristics at  $T_J=25^{\circ}\text{C}$

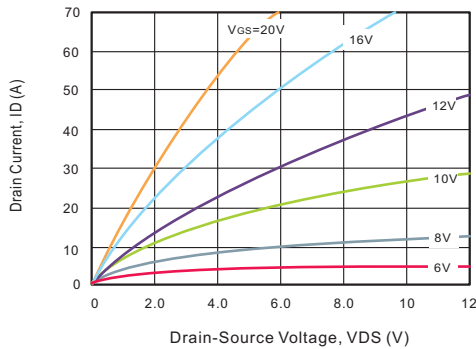


Fig.2 Typical forward Output characteristics at  $T_J=175^{\circ}\text{C}$

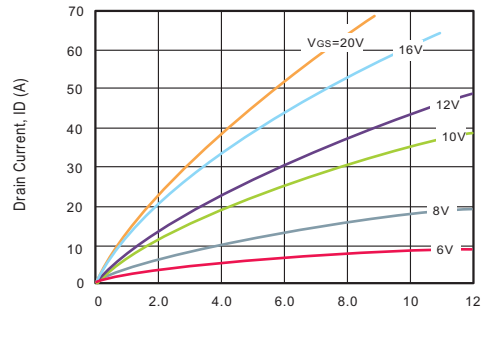


Fig.3 On-Resistance vs. Gate Voltage for various Temperature

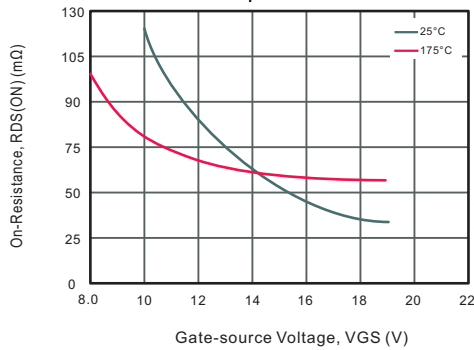


Fig.4 Threshold Voltage vs. Temperature

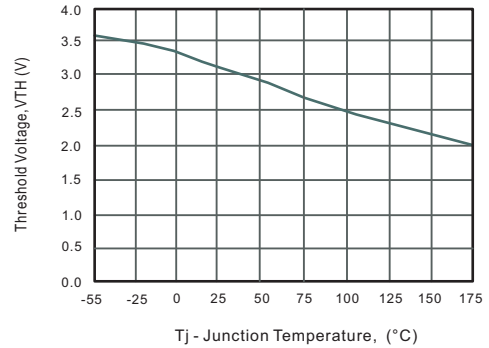


Fig.5 On-Resistance vs. Junction Temperature

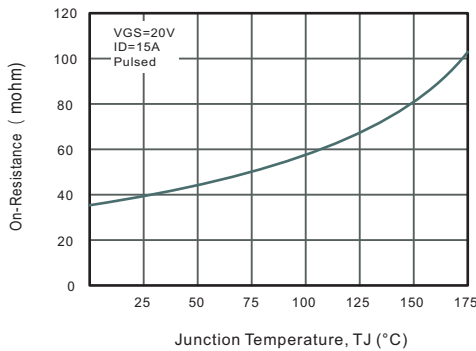


Fig.6 Diode Forward Voltage vs. Current

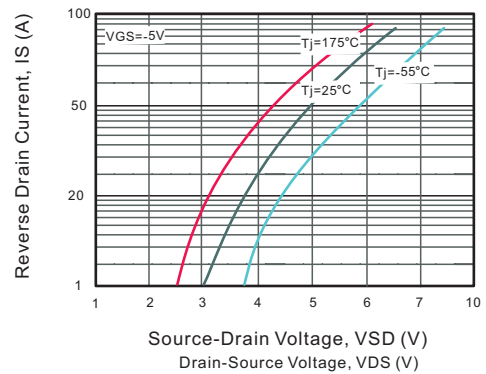


Fig.7 Capacitance Characteristics

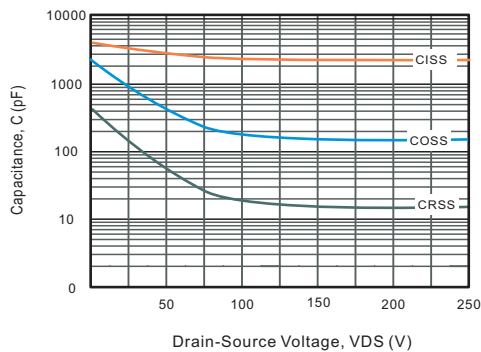
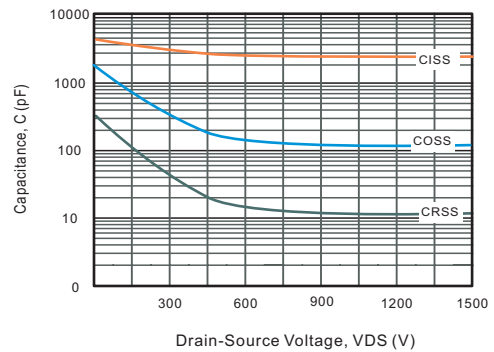
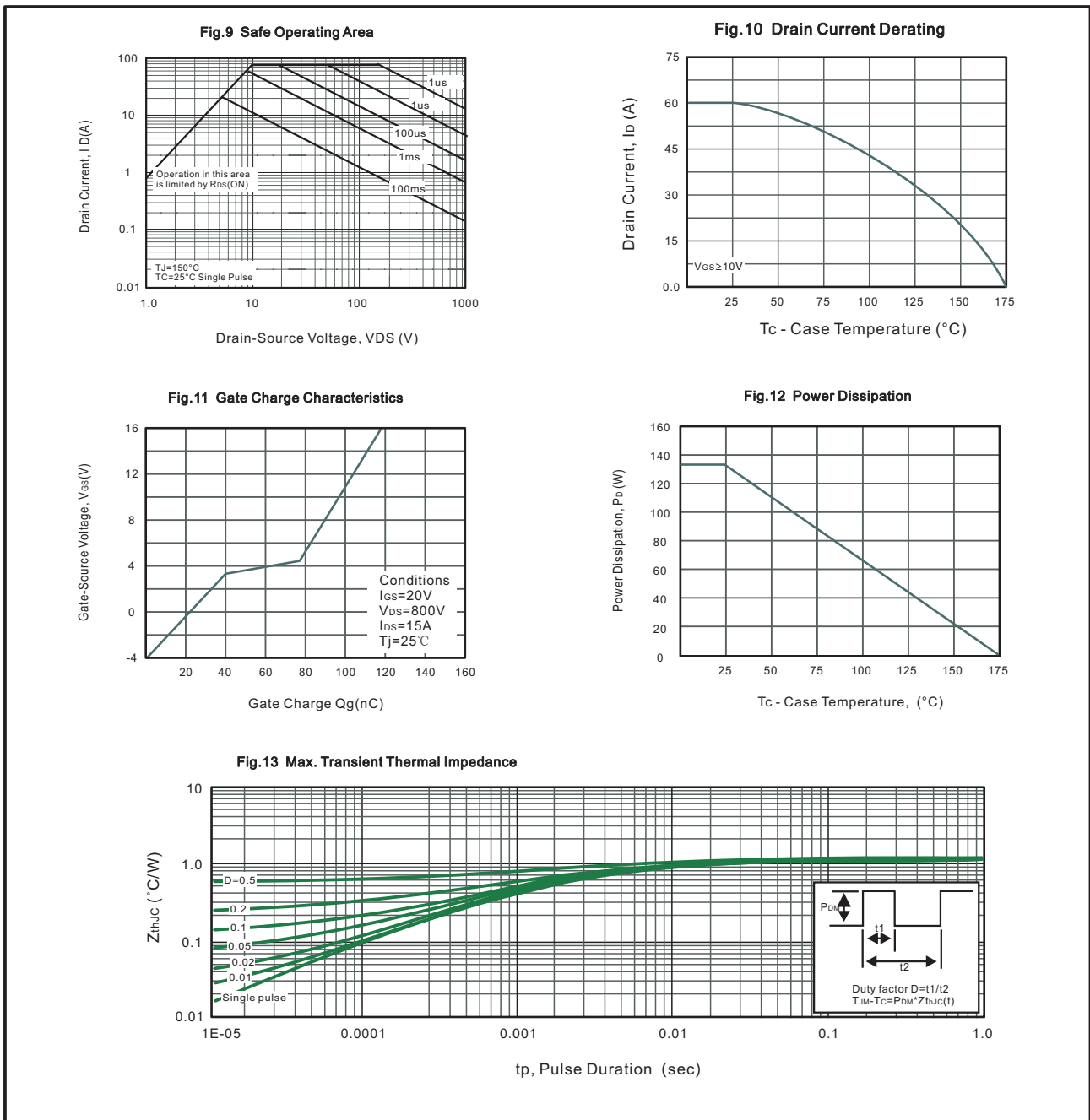


Fig.8 Capacitance Characteristics





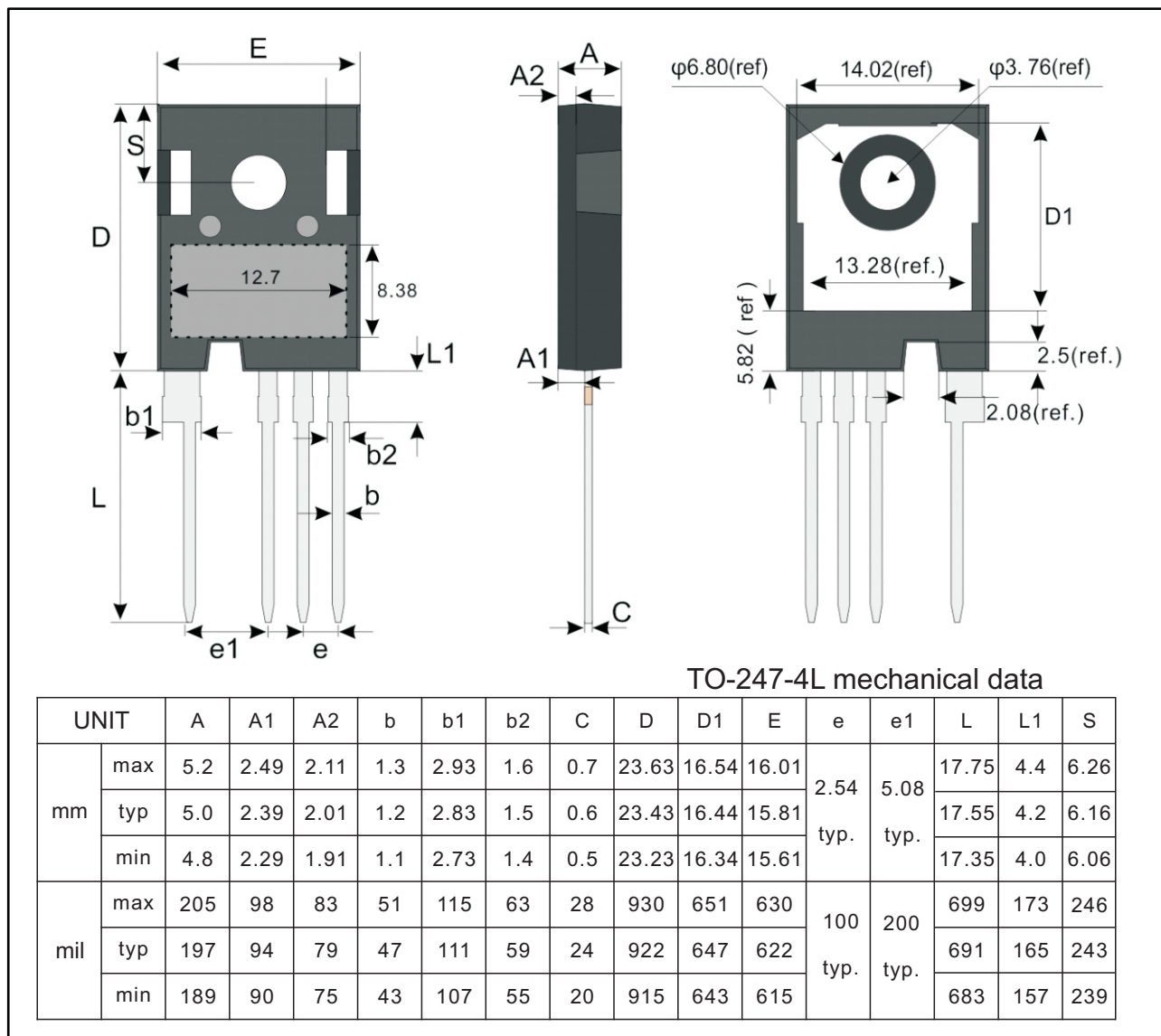
### Typical Characteristics





Package Outline  
Through Hole Package ; 4 leads

TO-247-4L



**Marking**

Type number	Marking code
SC040N120W4H	SC040N120W4H



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