



N-Channel SiC Power MOSFET

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

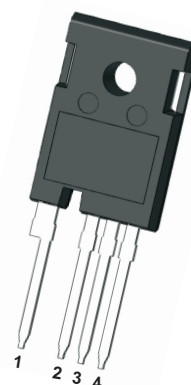
V_{DS}	1200V
$I_D@25^{\circ}C$	44.5A
$R_{DS(on)}$	60 m Ω

DESCRIPTION

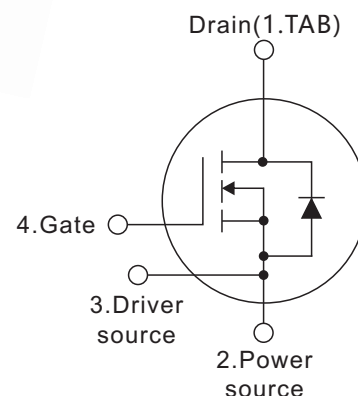
- 8mm Of Creepage Distance Between Drain And Source
- 3rd Generation Sic Mosfet Technology
- High Blocking Voltage With Low On-resistance
- High-speed Switching With Low Capacitances
- Halogen Free, Rohs Compliant.

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}	-15/+20	Absolute maximum values	V
Continuous Drain Current	I_D	44.5	$V_{GS}=18V, T_c=25^{\circ}C$	A
Continuous Drain Current	I_D	30.6	$V_{GS}=18V, T_c=110^{\circ}C$	A
Pulsed Drain Current (Note 1)	$I_{D(Pulse)}$	90.5	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
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=100\mu A$	1200			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=1200V, V_{GS}=0V$			50	uA
		$V_{DS}=1200V, V_{GS}=0V, T_j=175^\circ C$			500	
Gate- Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=15V$			250	nA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=0.25mA$	1.8	2.5	4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=20V, I_D=20A, T_j=25^\circ C$		60	80	mΩ
		$V_{GS}=20V, I_D=20A, T_j=175^\circ C$		100		
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	$V_{GS}=0V, V_{DS}=800V$		2200		pF
Output Capacitance	C_{OSS}	$f=1MHz$		115		pF
Reverse Transfer Capacitance	C_{RSS}	$V_{AC}=25mV$		18.5		pF
Gate resistance	R_G	$f=1MHz, V_{AC}=25mV$		1.2		Ω
Transconductance $T_c=25^\circ C$	g_{fs}	$V_{DS}=12.5V, I_D=40A$		10.5		S
Turn-On Energy (Body Diode)	E_{ON}	$V_{DS}=800V, V_{GS}=-15/20V,$		120		uJ
Turn-Off Energy (Body Diode)	E_{OFF}	$I_D=20A, L=80\mu H$		44		uJ
Total Gate Charge (Note 1)	Q_G	$V_{DS}=800V$		129		nC
Gate-Source Charge	Q_{GS}	$V_{GS}=-5V/20V$		29		nC
Gate-Drain Charge	Q_{GD}	$I_D=20A$		64		nC
Turn-On Delay Time (Note 1)	$t_{D(ON)}$	$V_{DS}=800V, V_{GS}=-4/20V,$		25		ns
Turn-On Rise Time	t_R	$I_D=20A, R_G=2.7\Omega$		24		ns
Turn-Off Delay Time	$t_{D(OFF)}$	Timing relative to V_{DS}		20		ns
Turn-Off Fall Time	t_F			9		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Maximum Body-Diode Continuous Current	I_S	$T_j=25^\circ C$			44.5	A
Drain-Source Diode Forward Voltage (Note 1)	V_{SD}	$I_{SD}=10A, V_{GS}=-4V$		5.8		V
Reverse Recovery Time (Note 1)	t_{rr}	$I_F=20A, V_{GS}=0V, di/dt$		57		ns
Reverse Recovery Charge	Q_{rr}	$=300A/\mu s, V_R=400V$		109		uC

Notes:

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



Typical Characteristics

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

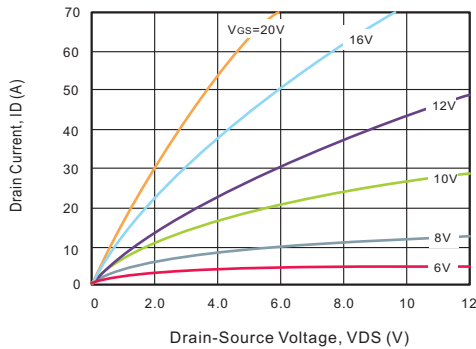


Fig.2 Typical forward Output characteristics at $T_J=175^{\circ}\text{C}$

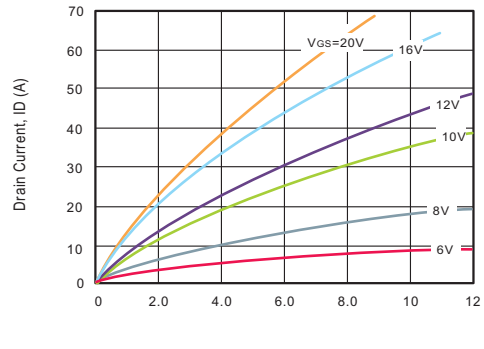


Fig.3 On-Resistance vs. Gate Voltage for various Temperature

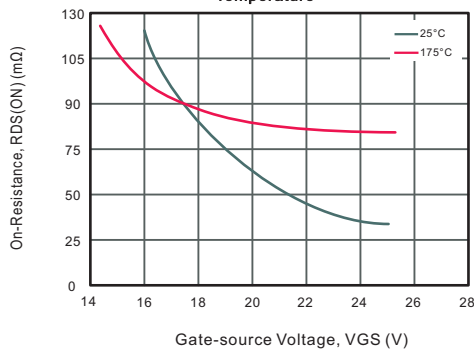


Fig.4 Threshold Voltage vs. Temperature

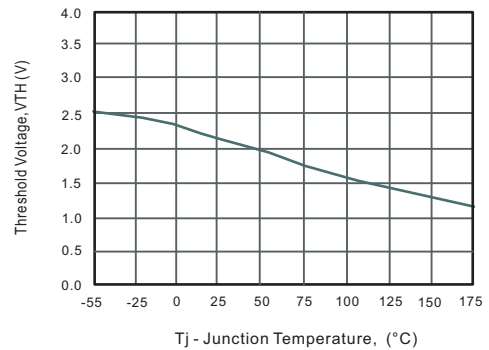


Fig.5 On-Resistance vs. Junction Temperature

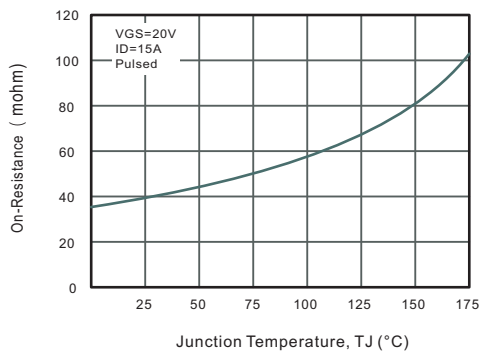


Fig.6 Diode Forward Voltage vs. Current

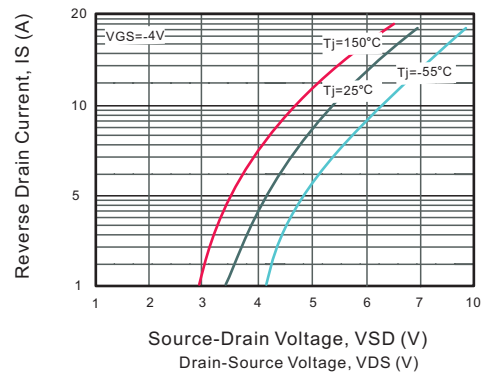


Fig.7 Capacitance Characteristics

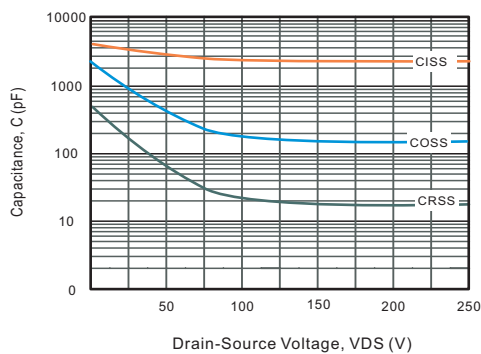
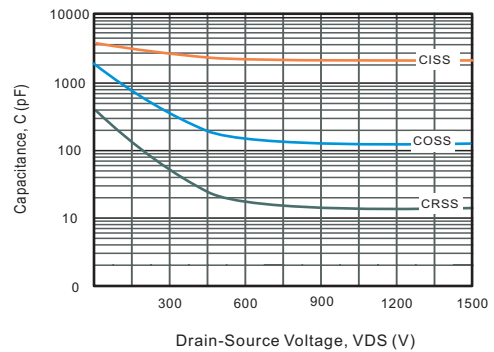
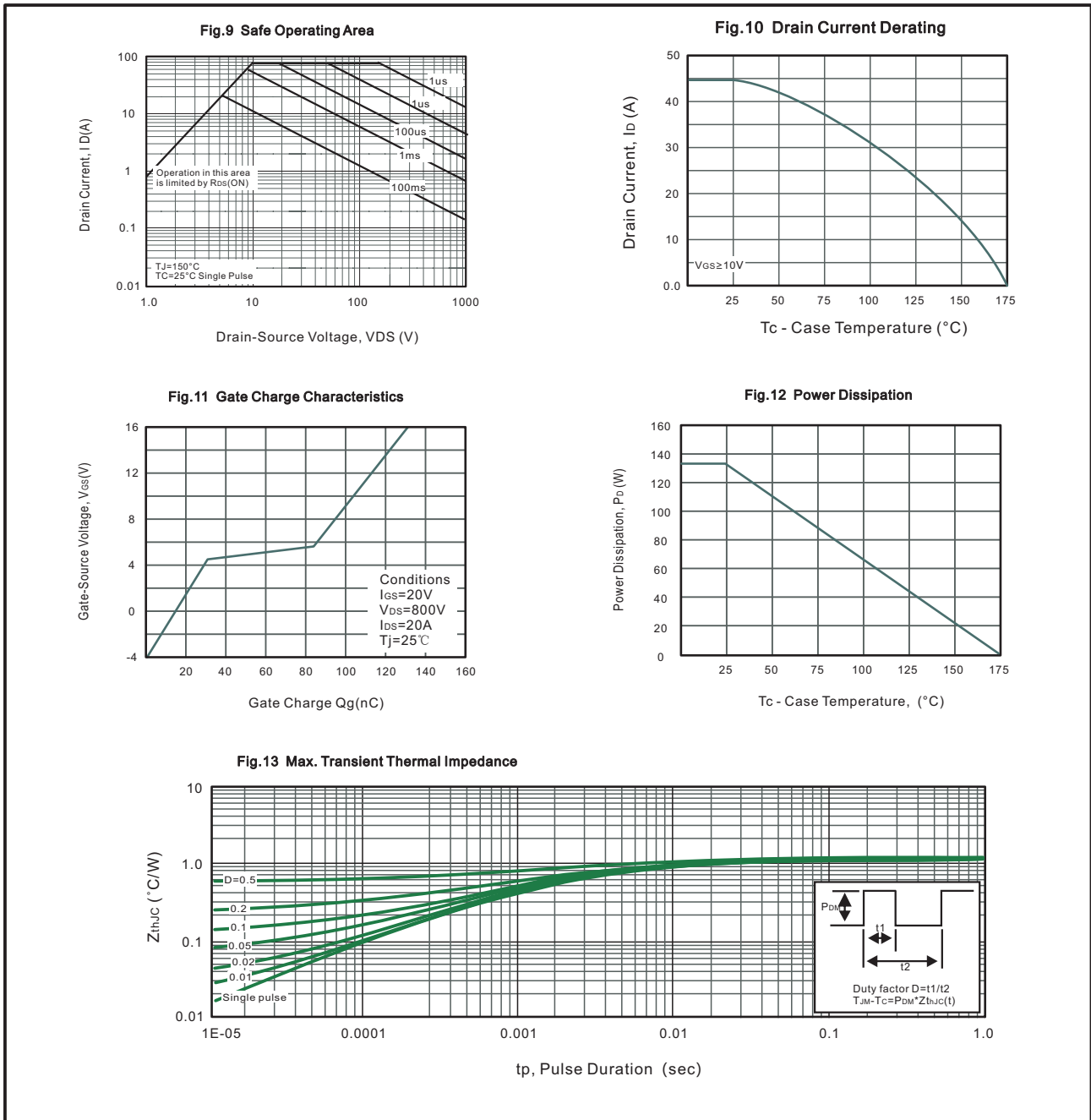


Fig.8 Capacitance Characteristics





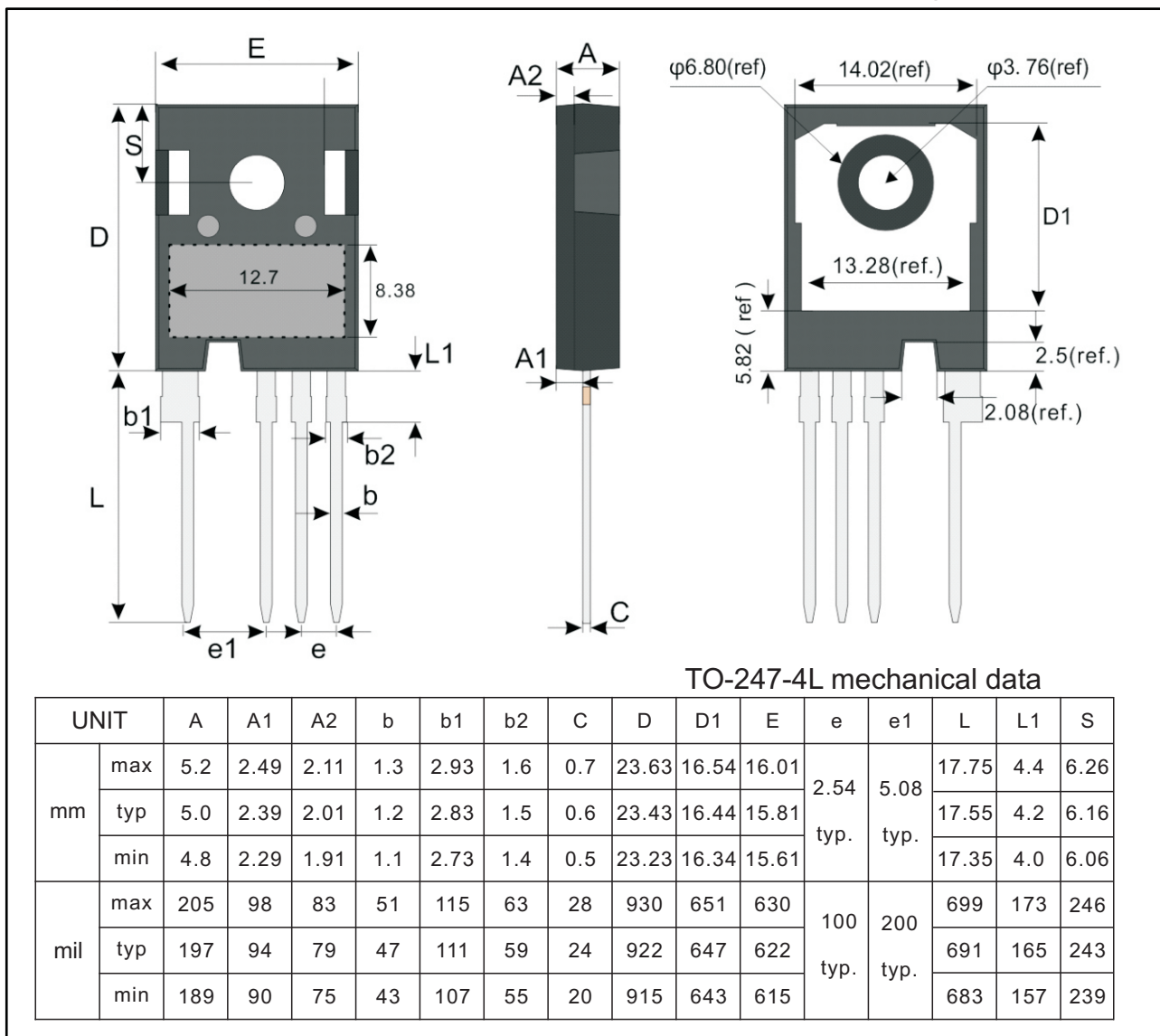
Typical Characteristics





Package Outline
Through Hole Package ; 3 leads

TO-247-4L



Marking

Type number	Marking code
SC060N120W4T	SC060N120W4T



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