

Features

- Wide Bandgap SiC MOSFET Technology
- Low On-Resistance with High Blocking Voltage
- Low Capacitances with High-Speed Switching
- Low Reverse Recovery (Qrr)
- Easy to Parallel and Simple to Drive
- Robust against Parasitic Turn on Even 0V Turn off Gate Voltage

Benefits

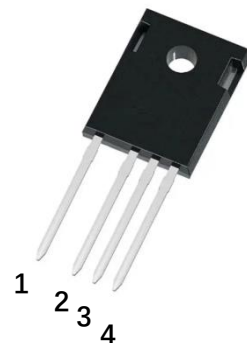
- Reduced Switching Losses
- Increased System Switching Frequency
- Increased Power Density
- Reduction of Heat Sink Requirements
- Reduced EMI

Application

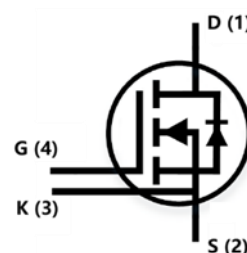
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Battery Chargers
- Motor Drives
- Pulsed Power Applications

Package parameters

Parameter		Value	Unit
V_{DS}		650	V
$R_{DS(on)_{typ.}}$	$V_{GS} = 18V$	20	m Ω
I_D		120	A



TO-247-4L(A) TopView



Schematic Diagram

Part Number	Marking	Package	Packaging Method
CI100N65SM4	CI100N65SM4	TO-247-4L(A)	TUBE

Maximum ratings at $T_j=25^{\circ}\text{C}$, Unless otherwise specified

Parameter	Symbol	Test Condition	Value	Unit
Drain to Source Voltage	V_{DS}	$V_{GS} = 0\text{V}$, $I_D = 100\mu\text{A}$	650	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	0/+18	V
Continuous Drain Current	I_D	$V_{GS}=18\text{V}$, $T_C=25^{\circ}\text{C}$	120	A
		$V_{GS}=18\text{V}$, $T_C=100^{\circ}\text{C}$	100	
Pulsed Drain Current	I_{DM}	$V_{GS}=18\text{V}$, $T_C=25^{\circ}\text{C}$	240	A
Power Dissipation	P_{tot}	$T_C=25^{\circ}\text{C}$, $T_j=175^{\circ}\text{C}$	333	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	$R_{th(j-c)}$	-	0.45	-	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics

Static Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{V}$, $I_D=500\mu\text{A}$	650			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}$, $I_D=23\text{mA}$	2.7		4.5	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS}=0\text{V}$, $V_{DS}=650\text{V}$, $T_j=25^{\circ}\text{C}$	-		10	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=18\text{V}$, $V_{DS}=0\text{V}$	-		250	nA
Drain to Source on Resistance	$R_{DS(on)}$	$V_{GS}=18\text{V}$, $I_D=60\text{A}$	-	20	26	
		$V_{GS}=18\text{V}$, $I_D=60\text{A}$, $T_j=175^{\circ}\text{C}$		23		

Dynamic Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=500V, f=100KHz,$ $T_j=25^{\circ}C$		3200		pF
Output Capacitance	C_{oss}			230		
Reverse Transfer Capacitance	C_{rss}			20		
Total Gate Charge	Q_g	$V_{GS}=0/18V, V_{DS}=500V, I_D=60A,$ $T_j=25^{\circ}C$		125		nC
Gate-Source Charge	Q_{gs}			35		
Gate-Drain Charge	Q_{gd}			17		
Gate Resistance	R_g	$V_{AC}=25mV, f=1MHz$		1.3		Ω

Switching Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=0/18V, V_{DD}=500V,$ $I_D=20A, R_g=10\Omega$		21		ns
Rise Time	t_r			76		
Turn-Off Delay Time	$t_{d(off)}$			70		
Fall Time	t_f			37		

Reverse Diode Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=30A, T_j=25^{\circ}C$	-	3.4		V
Continuous Diode Forward Current	I_S	$V_{GS}=0V, T_j=25^{\circ}C$		120		A
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_{SD}=60A,$ $V_R=500V, di/dt=400A/us, T_j=25^{\circ}C$		35		ns
Reverse Recovery Charge	Q_{rr}			13		nC
Peak Reverse Recovery Current	I_{rrm}			6		A

Typical Performance

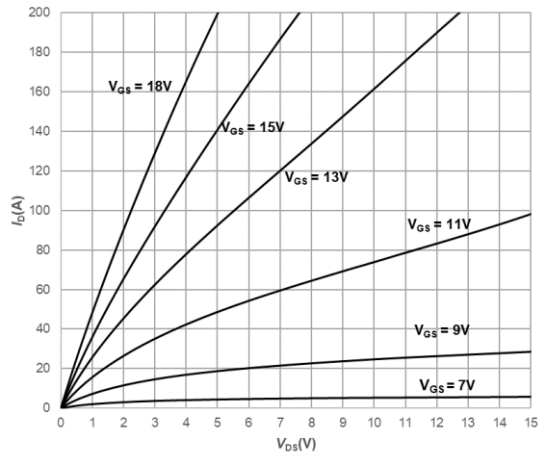


Fig1. Output Characteristics $T_j = 25^\circ\text{C}$

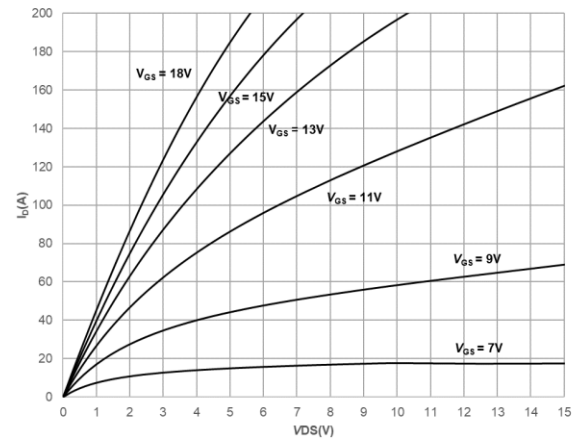


Fig2. Output Characteristics $T_j = 175^\circ\text{C}$

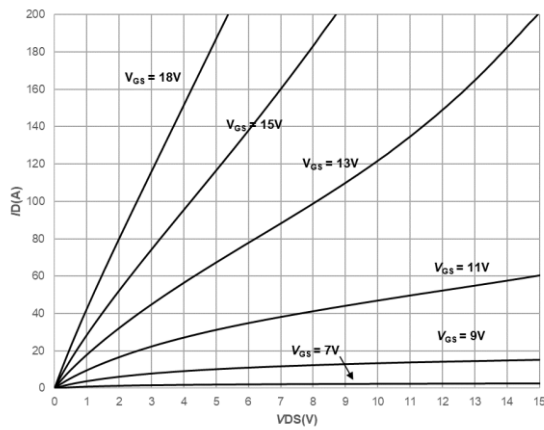


Fig3. Output Characteristics $T_j = -40^\circ\text{C}$

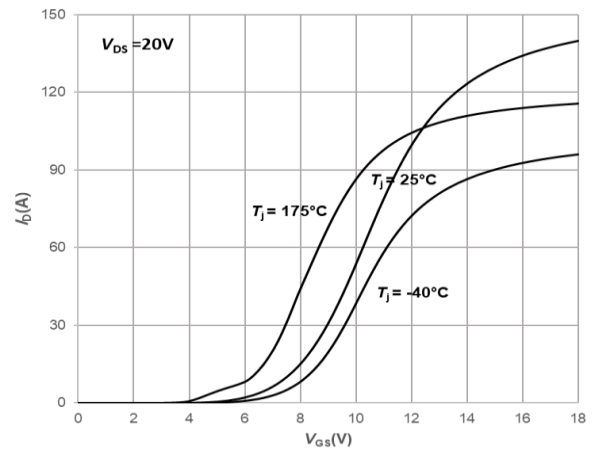


Fig4. Typical Transfer Characteristics

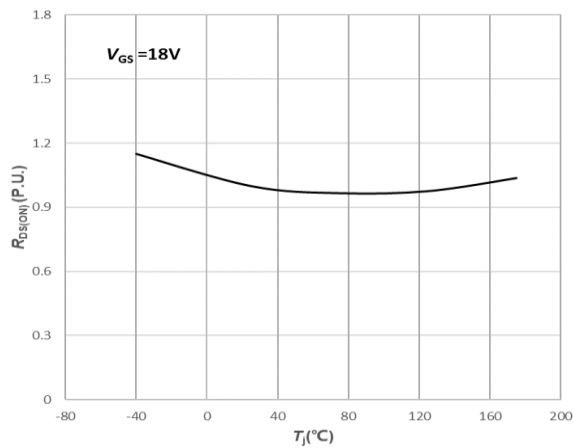


Fig5. Normalized On-Resistance vs. Temperature

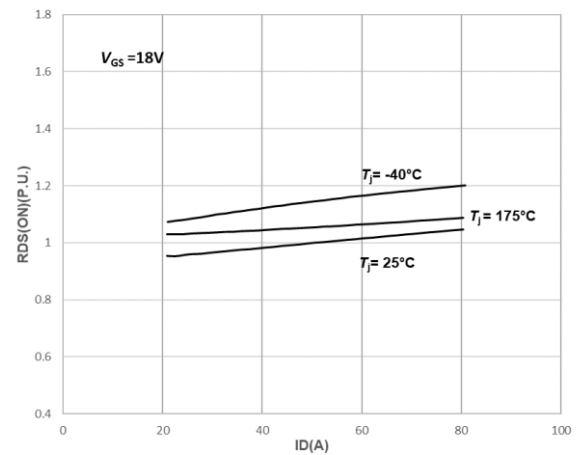


Fig6. Normalized On-Resistance vs. Drain Current For Various Temperatures

Typical Performance

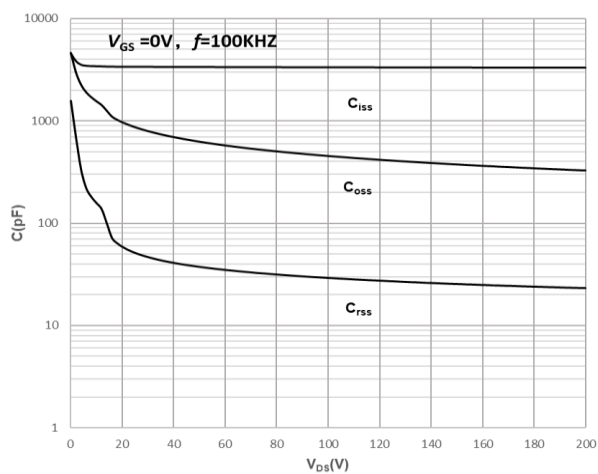


Fig7. Capacitances vs. Drain-Source Voltage (0-200V)

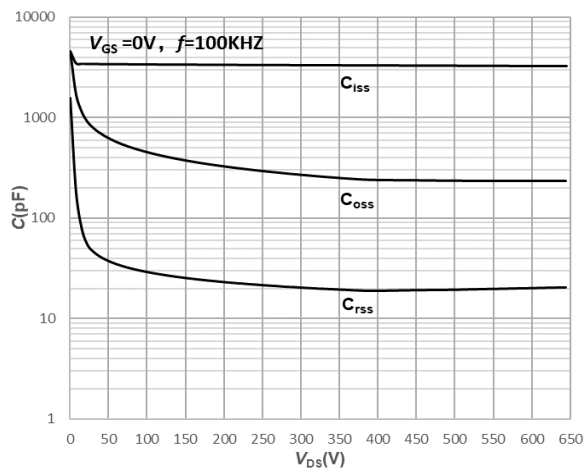


Fig8. Capacitances vs. Drain-Source Voltage (0-650V)

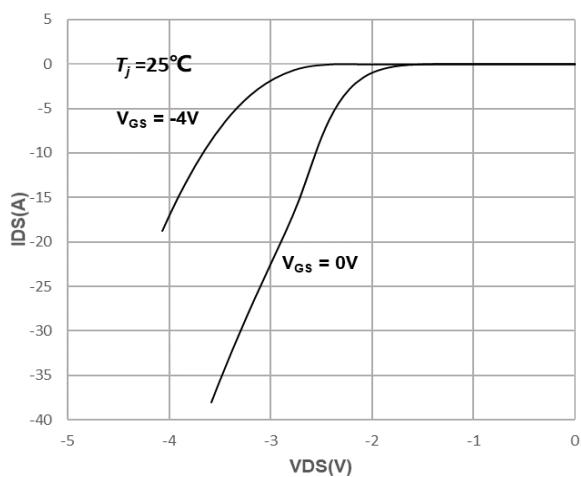


Fig9 Body Diode Characteristics

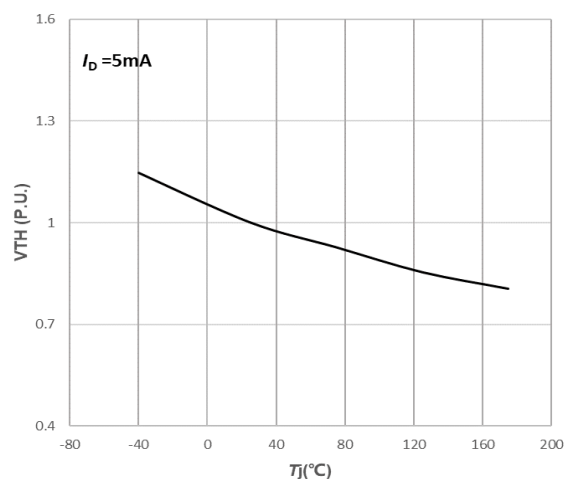
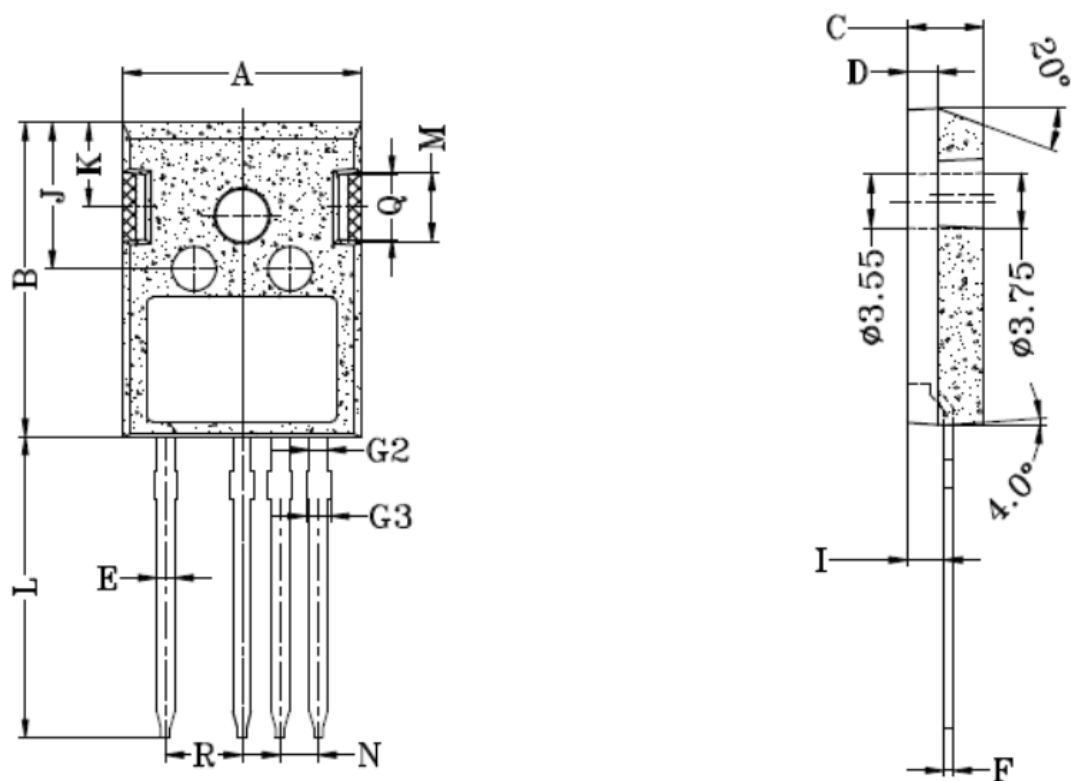


Fig10 Normalized Threshold Voltage vs. Temperature

TO-247-4L(A) Package Dimensions


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
φ P	3.40	3.60
Q	4.232	4.432
R	4.88	5.28

