

Features

- SiC MOSFET technology
- High blocking voltage with low on-resistance
- High-speed switching with low capacitances
- Halogen Free. "Green" Device (Note 1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 1.7°C/W Junction to Case

Applications

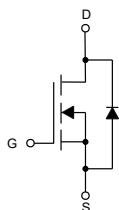
- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Battery Chargers
- Motor Drives

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	1700	V
Gate-Source Voltage	V_{GSmax}	-5/+25	V
Gate-Source Voltage	V_{GSop}	-3/+20	V
Continuous Drain Current	I_D	3	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	12	A
Total Power Dissipation	P_D	69	W

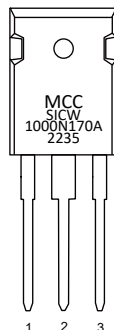
Note:

1. Pulse Test: Pulse Width $\leq 10\mu s$, Duty Cycle $\leq 1\%$.

Internal Structure

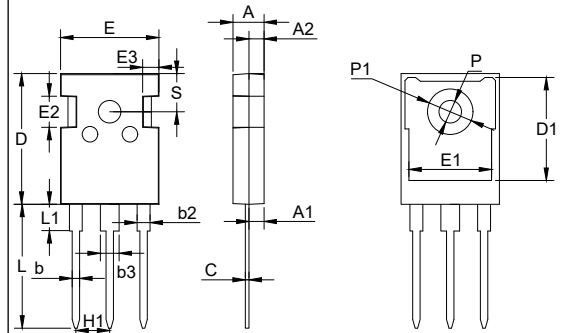


1. Gate
2. Drain
3. Source



N-CHANNEL MOSFET

TO-247AB



DIMENSIONS

DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.189	0.205	4.80	5.20	
A1	0.087	0.103	2.21	2.61	
A2	0.073	0.085	1.85	2.15	
b	0.039	0.055	1.00	1.40	
b2	0.075	0.087	1.91	2.21	
C	0.020	0.028	0.50	0.70	
D	0.815	0.839	20.70	21.30	
D1	0.640	0.663	16.25	16.85	
E	0.610	0.634	15.50	16.10	
E1	0.512	0.535	13.00	13.60	
E2	0.189	0.205	4.80	5.20	
E3	0.091	0.106	2.30	2.70	
L	0.772	0.796	19.62	20.22	
L1	-	0.169	-	4.30	
P	0.134	0.150	3.40	3.80	Φ
P1	-	0.287	-	7.30	Φ
S	0.242		6.15		TYP
H1	0.214		5.44		TYP
b3	0.110	0.126	2.80	3.20	

Electrical Characteristics @ 25°C (Unless Otherwise Specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	1700			V
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 250	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=1700V, V_{GS}=0V$			10	μA
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=10V, I_D=1mA$	2.5		4.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=20V, I_D=1.5A$		1100	1320	m Ω
		$V_{GS}=18V, I_D=1.5A$		1140	1370	m Ω
		$V_{GS}=15V, I_D=1.5A$		1230	1480	m Ω
		$V_{GS}=20V, I_D=1.5A, T_C=150^\circ C$		1690		m Ω
Diode Characteristics						
Continuous Body Diode Current	I_S			3		A
Diode Forward Voltage	V_{SD}	$V_{GS}=-3V, I_S=1.5A$		5.5		V
Reverse Recovery Time	t_{rr}	$V_{GS}=-3/20V, I_{SD}=3A, dl_F/dt=300A/\mu s$		7.5		ns
Reverse Recovery Charge	Q_{rr}		5		nC	
Peak Reverse Recovery Current	I_{rrm}		1		A	
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=1000V, V_{GS}=0V, f=1MHz$		124		pF
Output Capacitance	C_{oss}		15			
Reverse Transfer Capacitance	C_{riss}		4.5			
Internal Gate Resistance	R_g		6		Ω	
Total Gate Charge	Q_g	$V_{DS}=1000V, V_{GS}=-3/+20V, I_D=3A$		15.5		nC
Gate-Source Charge	Q_{gs}		2.5			
Gate-Drain Charge	Q_{gd}		9			
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=800V, V_{GS}=-3/+20V, R_G=25\Omega, I_{DS}=3A$		34		ns
Turn-On Rise Time	t_r		57			
Turn-Off Delay Time	$t_{d(off)}$		33			
Turn-Off Fall Time	t_f		45			

Curve Characteristics

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

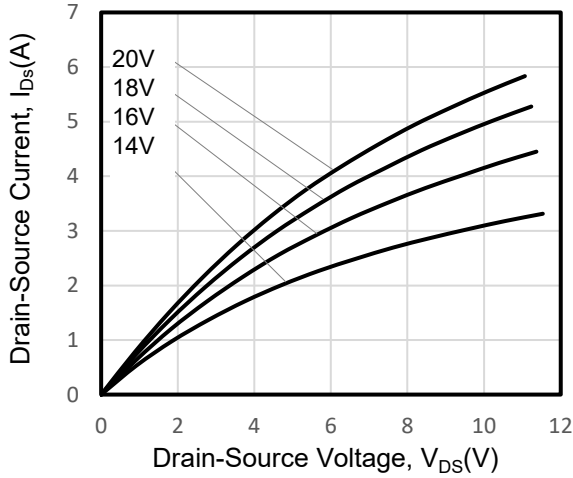


Fig. 2 Forward Output Characteristics at $T_j = 150^\circ\text{C}$

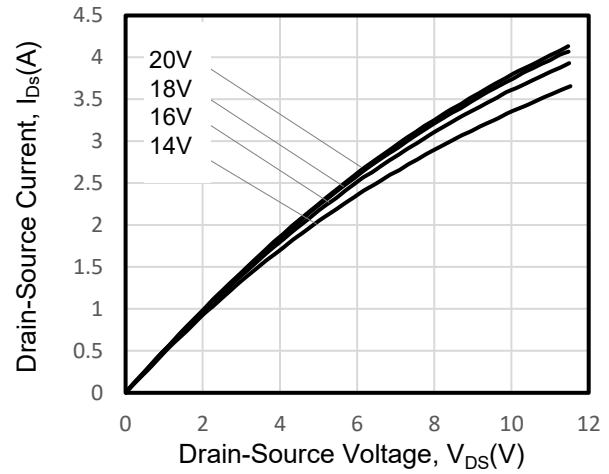


Fig. 3 On-Resistance vs. Drain Current for Various T_j

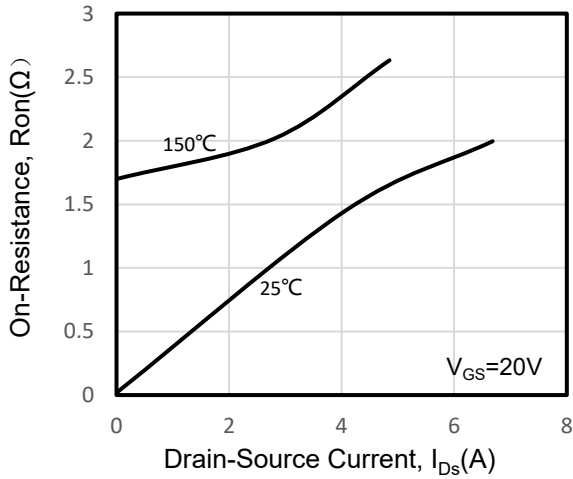


Fig. 4 Transfer Characteristics for Various T_j

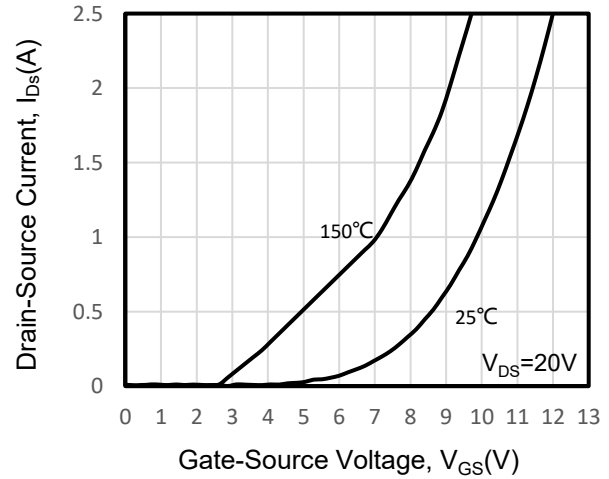


Fig. 5 On-Resistance vs. Gate Voltage for Various T_j

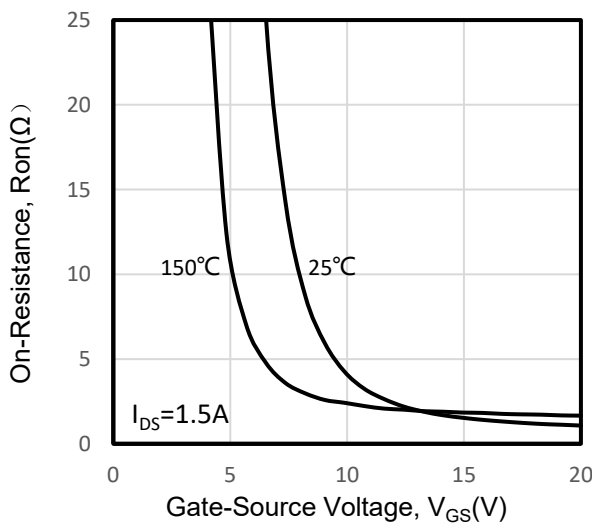
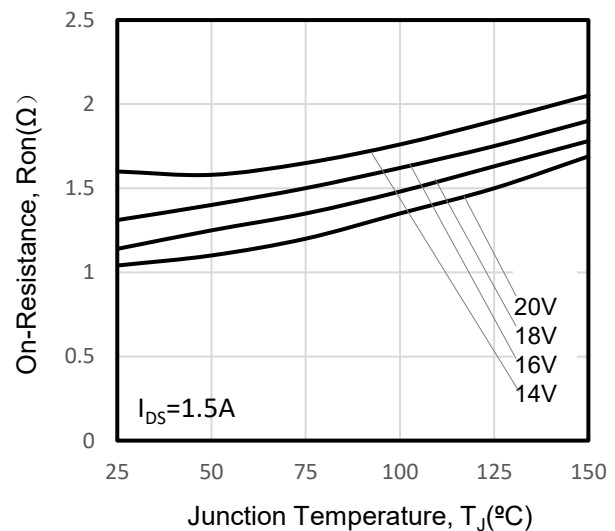


Fig. 6 On-Resistance vs. Temperature for Various Gate Voltage



Curve Characteristics

Fig. 7 Normalized On-Resistance vs. Temperature

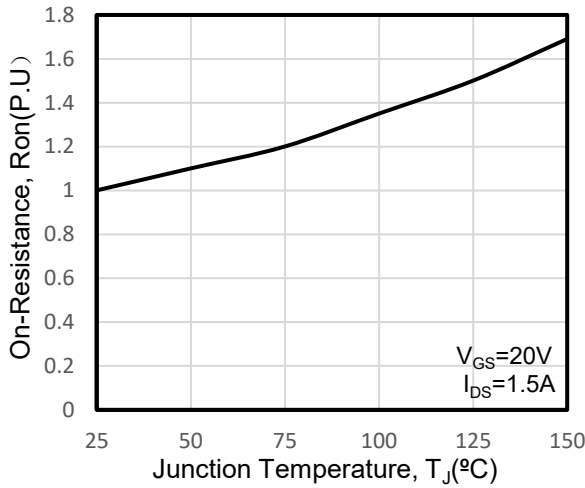


Fig. 8 Reverse Output Characteristics at Tj = 25°C

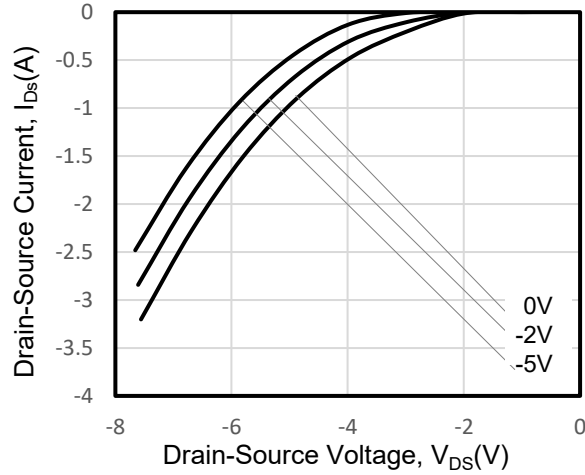


Fig. 9 Reverse Output Characteristics at Tj = 150°C

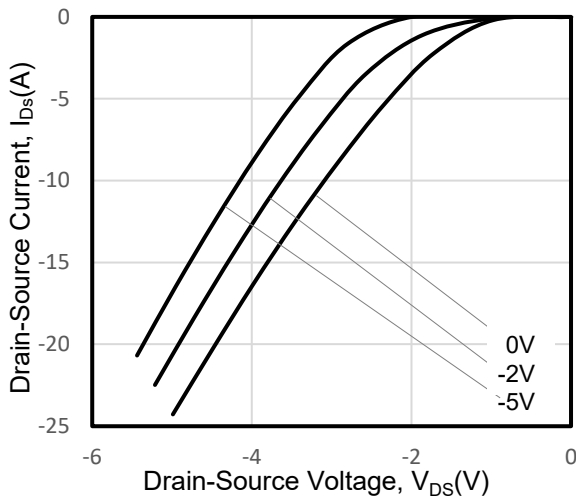


Fig. 10 Capacitances vs. Drain to Source Voltage (0 - 200V)

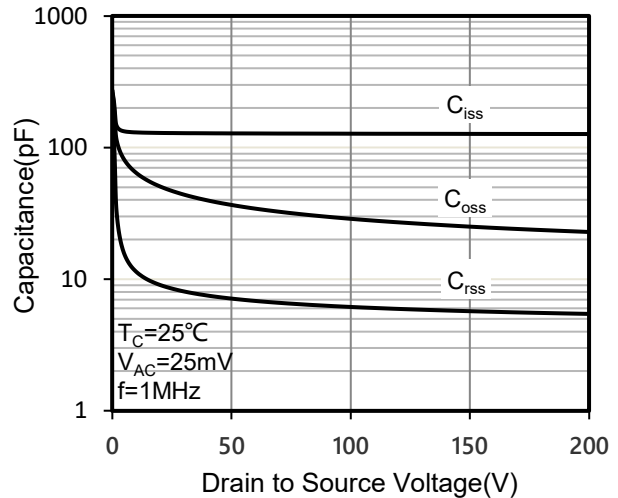


Fig. 11 Capacitances vs. Drain to Source Voltage (0 - 1000V)

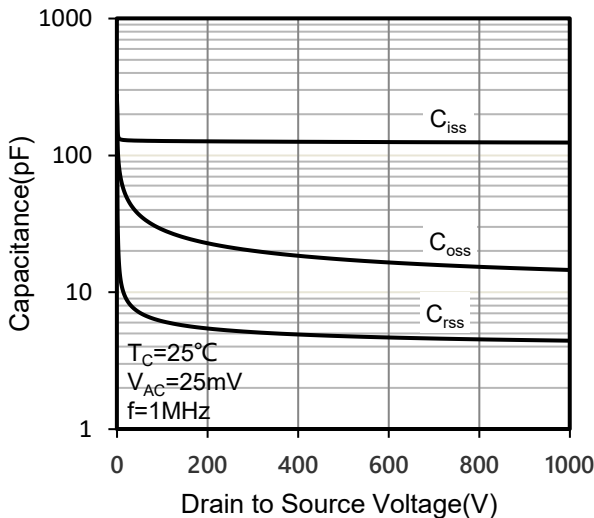
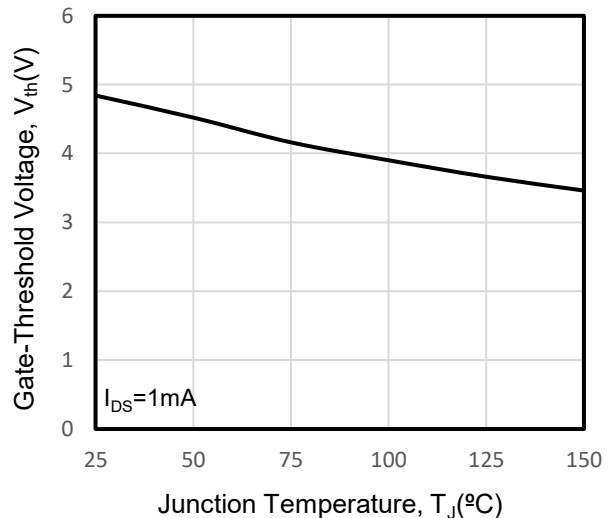


Fig. 12 Threshold Voltage vs. Temperature



Curve Characteristics

Fig. 13 Gate Charge Characteristics

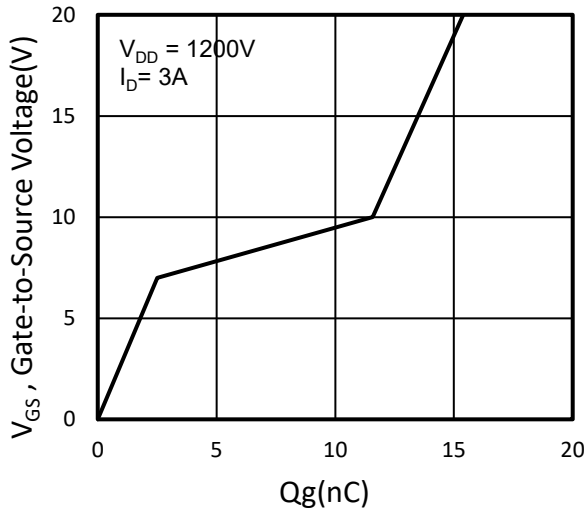


Fig.14 Maximum Power Dissipation Derating vs. Case Temperature

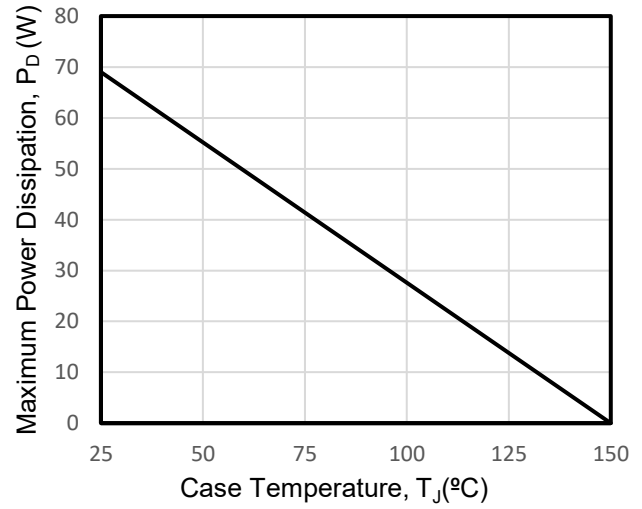


Fig. 15 Drain Current Derating vs. Case Temperature

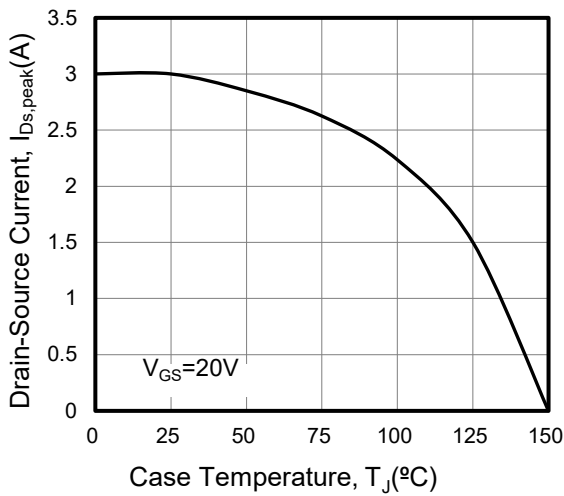


Fig. 16 Transient Junction to Case Thermal Impedance

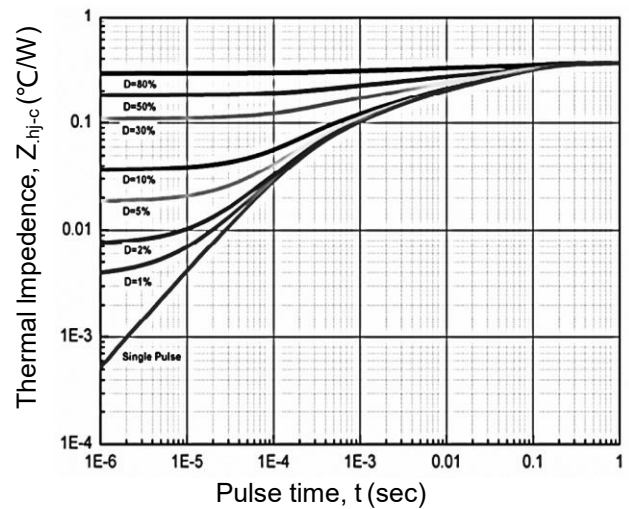
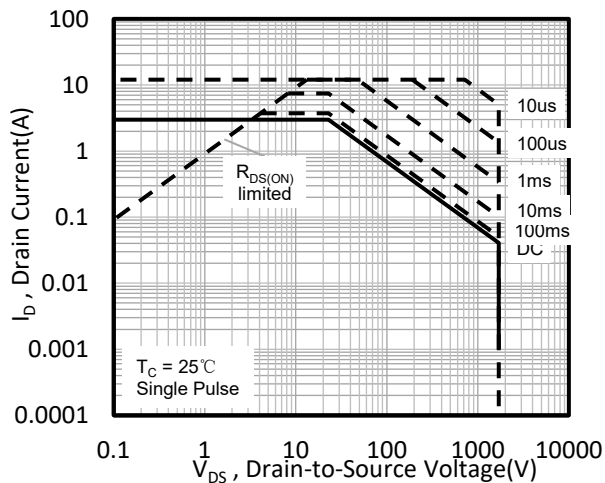


Fig. 17 Safe Operating Area



Ordering Information

Device	Packing
SICW1000N170A-BP	Tube:30pcs/Tube, 360pcs/Box,1.8K/Ctn;

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