

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 +175°C
- Storage Temperature Range: -55°C to +175°C
- Thermal Resistance: 0.68°C/W Junction to Case

Applications

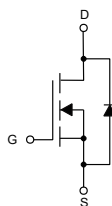
- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Battery Chargers
- Motor Drives

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	1200	V
Gate-Source Voltage	V_{GSmax}	-8/+22	V
Gate-Source Voltage	V_{GSop}	-4/+18	V
Continuous Drain Current	I_D	38	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	80	A
Total Power Dissipation, $T_c=25^\circ\text{C}$	P_D	220	W
Total Power Dissipation, $T_c=110^\circ\text{C}$	P_D	94	W

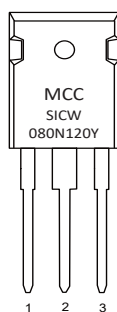
Note:

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

Internal Structure

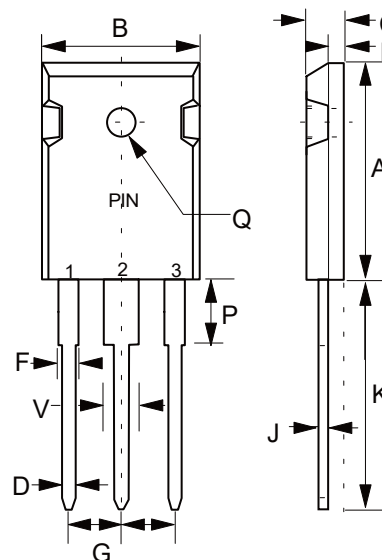


1. Gate
2. Drain
3. Source



N-CHANNEL MOSFET

TO-247



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.787	0.866	20.00	22.00	
B	0.598	0.638	15.20	16.20	
C	0.185	0.208	4.70	5.30	
D	0.035	0.059	0.90	1.50	
E	0.059	0.094	1.50	2.40	
F	0.067	0.091	1.70	2.30	
J	0.019	0.031	0.48	0.80	
K	0.748	0.833	19.00	21.15	
P	0.122	0.189	3.10	4.80	
Q	0.118	0.150	3.00	3.80	Φ
V	0.106	0.134	2.70	3.40	
G	0.197	0.224	5.00	5.70	

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 =100uA	1200			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =18V			100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =1200V, V _{GS} =0V		1	10	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =5mA	2.3	2.9	3.6	V
		V _{DS} =V _{GS} , I _D =5mA, T _j =175°C		2.2		V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =18V, I _D =20A		77	85	mΩ
		V _{GS} =18V, I _D =20A,T _j =175°C		122		mΩ
Internal Gate Resistance	R _g	f=1MHz		1.5		Ω
Transconductance	g _{FS}	V _{DS} =16V, I _D =20A		10		S
		V _{GS} =16V, I _D =20A,T _j =175°C		9.2		
Diode Characteristics						
Continuous Body Diode Current	I _S			38		A
Diode Forward Voltage	V _{SD}	V _{GS} =-4V, I _S =10A		3.9		V
		V _{DS} =0V, I _{SD} =10A, T _j =175°C		3.2		v
Reverse Recovery Time	t _{rr}	V _{GS} =-4V, I _{SD} =20A, dI _F /dt=2095A/μs		28.24		ns
Reverse Recovery Charge	Q _{rr}			190		nC
Peak Reverse Recovery Current	I _{rrm}			30.08		A
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =1000V,V _{GS} =0V,f=1MHz		890		pF
Output Capacitance	C _{oss}			58		
Reverse Transfer Capacitance	C _{rss}			4		
Coss Stored Energy	E _{oss}			34		
Total Gate Charge	Q _g	V _{DS} =800V,V _{GS} =-4/+18V I _D =20A		41		nC
Gate-Source Charge	Q _{gs}			12		
Gate-Drain Charge	Q _{gd}			11		
Turn-On Delay Time	t _{d(on)}	V _{DS} =800V, V _{GS} =-4/+15V, R _G =0Ω, I _{DS} =20A		21		ns
Turn-On Rise Time	t _r			17		
Turn-Off Delay Time	t _{d(off)}			14		
Turn-Off Fall Time	t _f			8		
Turn-On switching energy	E _{on}			377		uJ
Turn-Off switching energy	E _{off}			14		

Curve Characteristics

Fig. 1 - Typical Output Characteristics

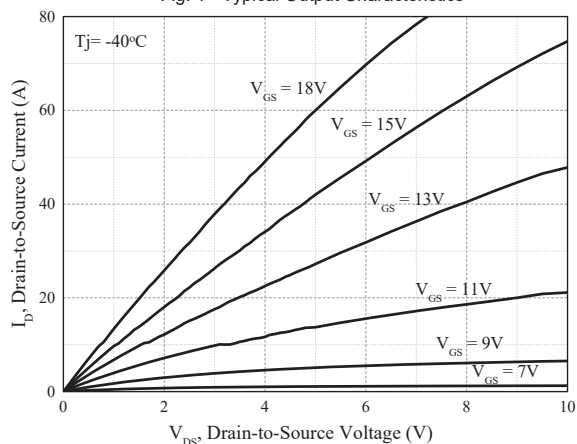


Fig. 2 - Typical Output Characteristics

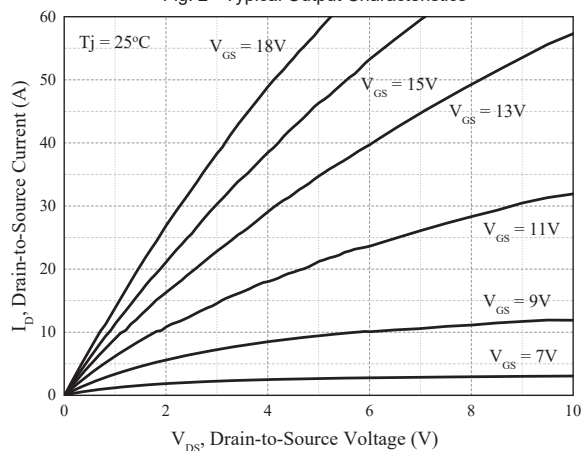


Fig. 3 - Typical Output Characteristics

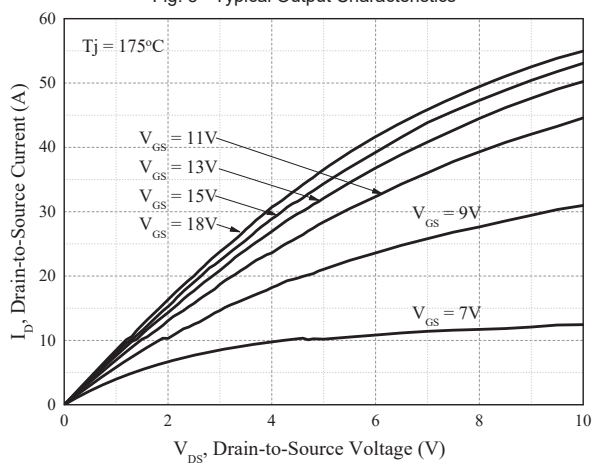


Fig. 4 - Transfer Characteristics for various junction temperature

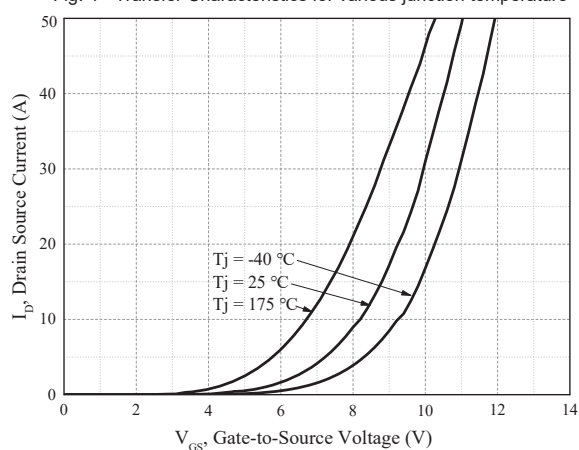


Fig. 5 - On-resistance vs.temperature for various gate voltage

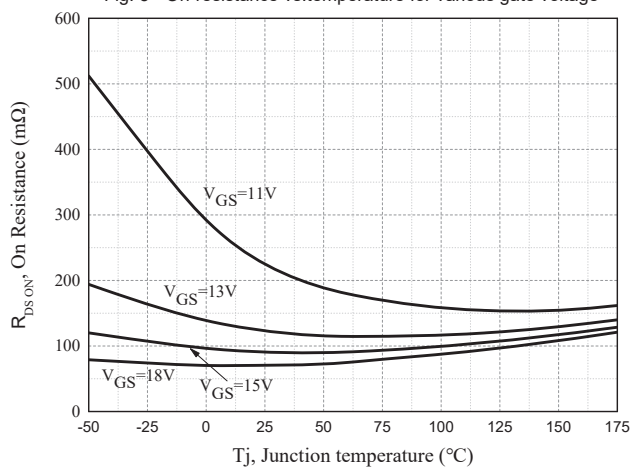
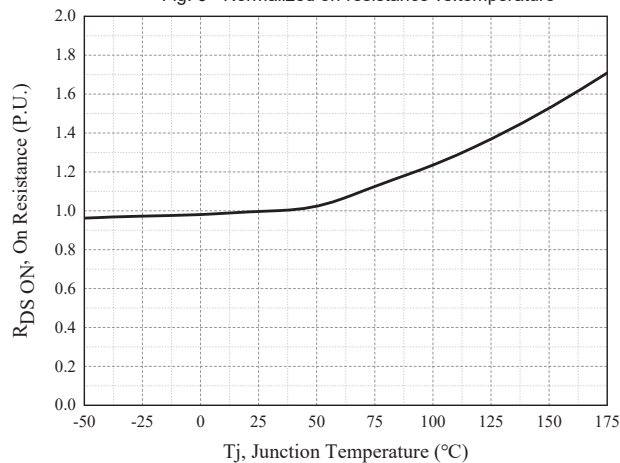


Fig. 6 - Normalized on-resistance vs.temperature



Curve Characteristics

Fig. 7 - On-resistance vs. drain current

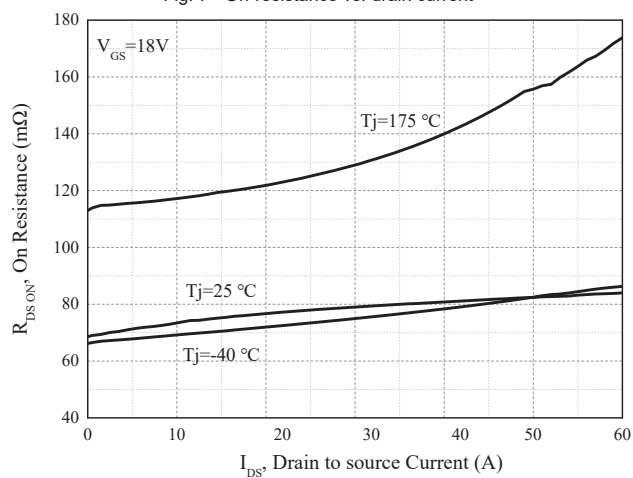


Fig. 8 - Body diode characteristic

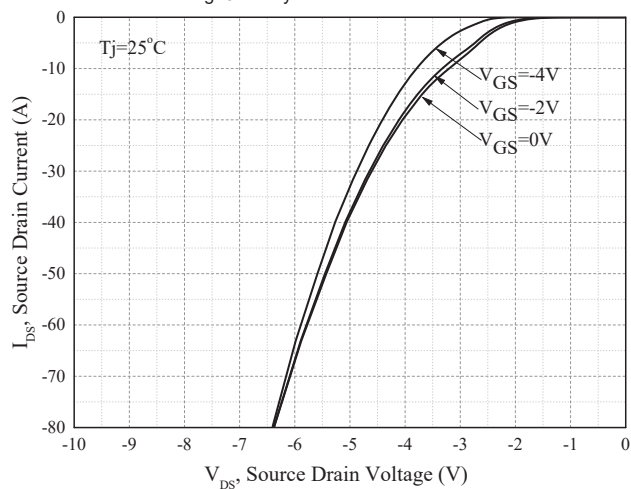


Fig. 9 - Body diode characteristic

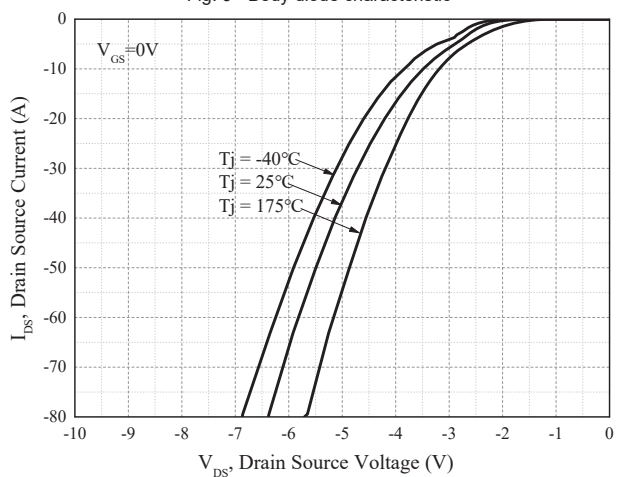


Fig. 10 - 3rd quadrant characteristic at $T_j=25^\circ C$

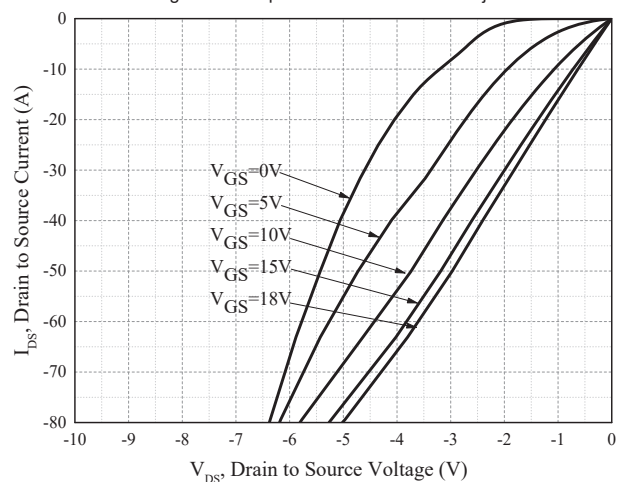


Fig. 11 - Threshold voltage vs. temperature

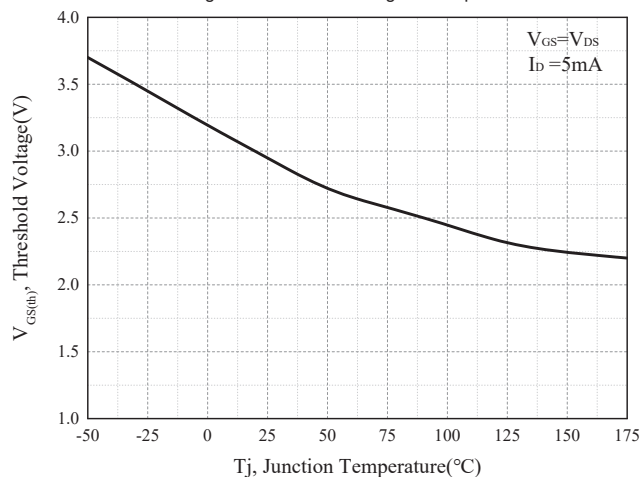
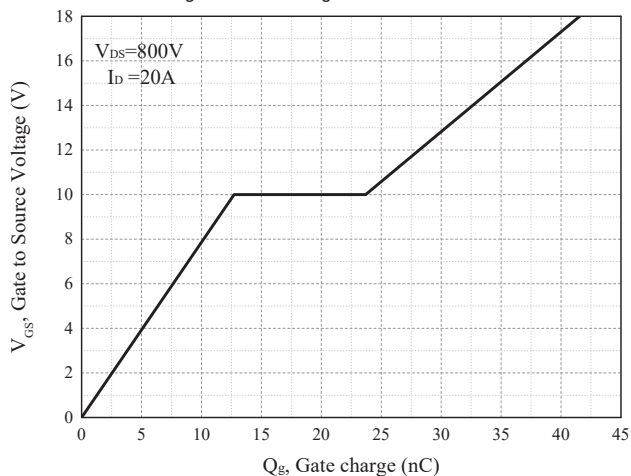


Fig. 12 - Gate charge characteristic



Curve Characteristics

Fig. 13 - Capacitances vs.drain source voltage (0-1000V)

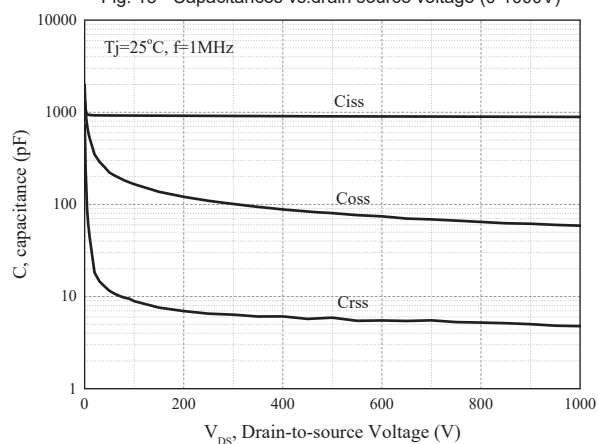


Fig. 14 - Capacitances vs.drain source voltage (0-200V)

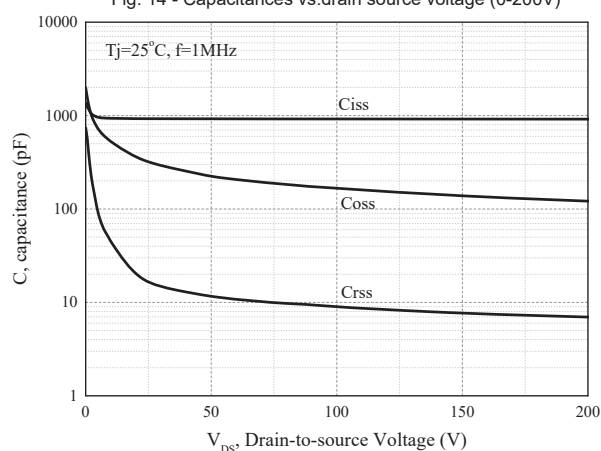


Fig. 15 - Output capacitor stored energy

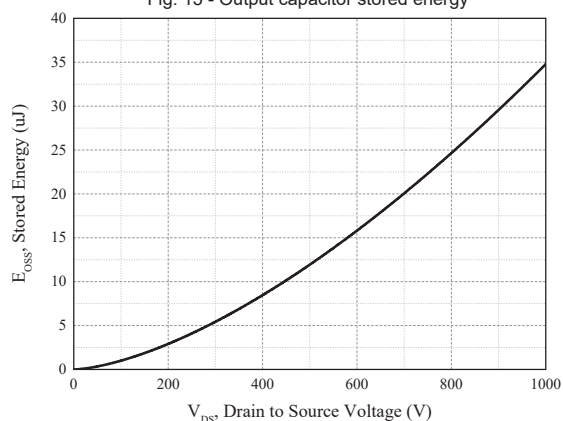


Fig. 16 - Reverse characteristics vs. Tj

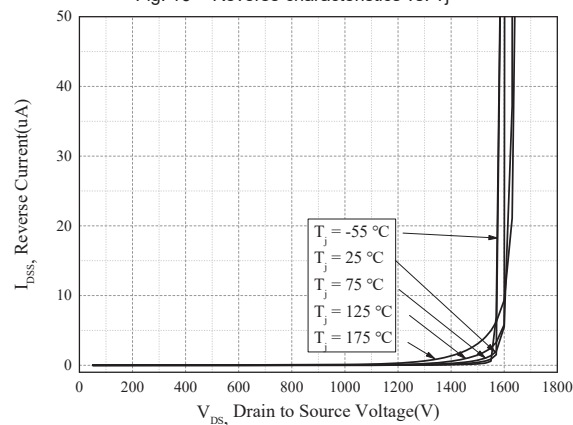


Fig. 17 - Maximum power dissipation derating vs. temperature

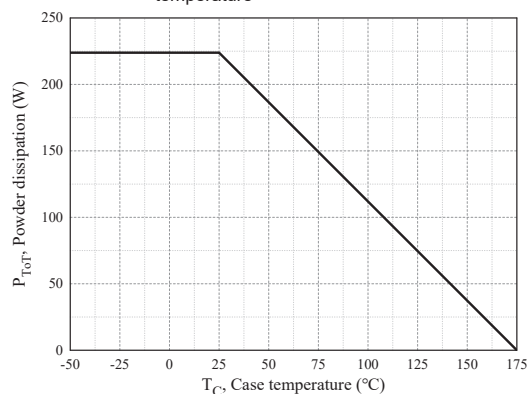
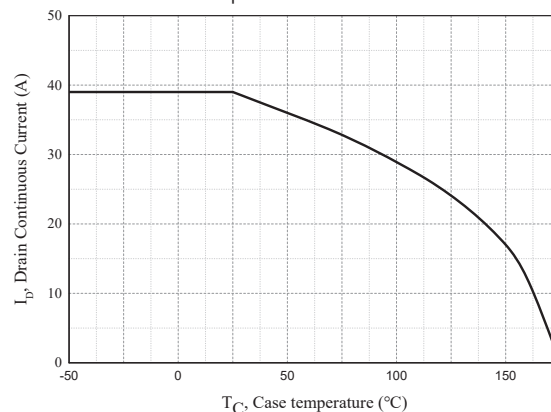


Fig. 18 - Coutinuous drain current derating vs. temperature



Curve Characteristics

Fig. 19 - Transient thermal impedance

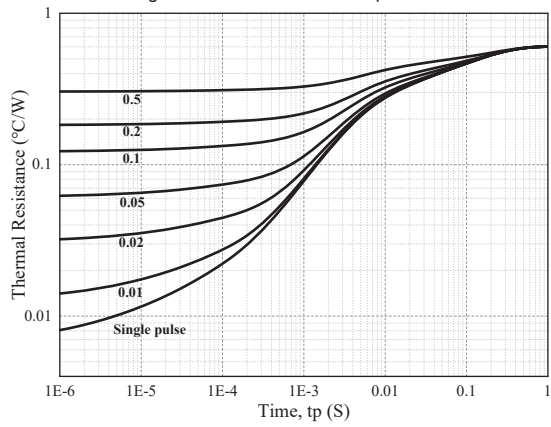


Fig. 20 - Clamped inductive switching energy vs. drain current

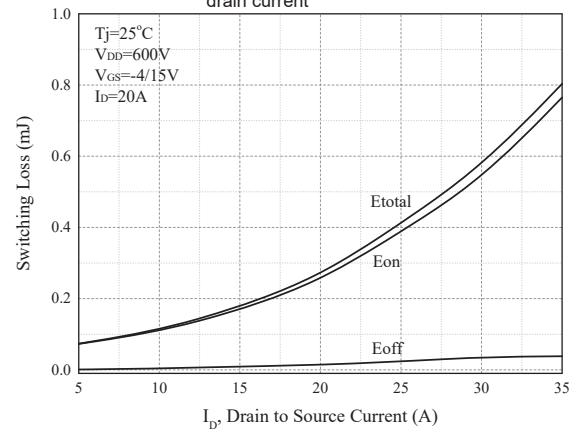


Fig. 21 - Clamped inductive switching energy vs. Rg

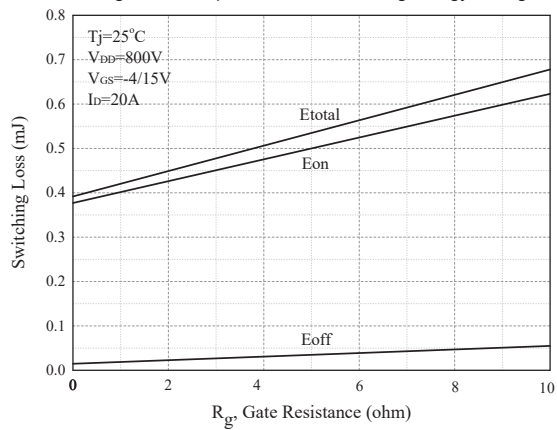


Fig. 22 - Switching times vs. Rg

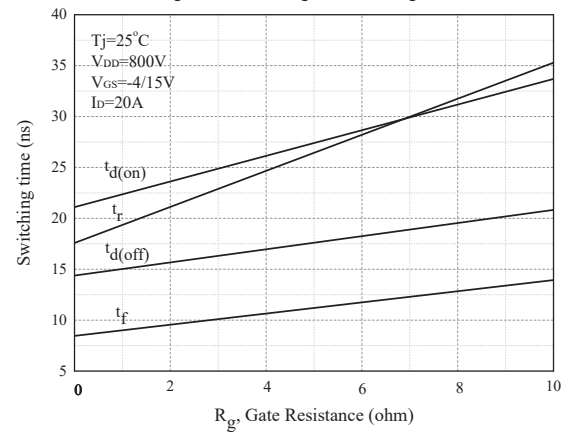
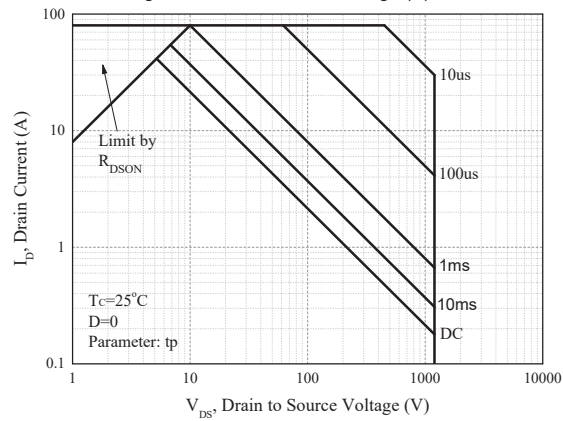


Fig. 23 - Drain to Source Voltage (V)



Ordering Information

Device	Packing
SICW080N120Y-BP	Tube:30pcs/Tube, 360pcs/Box, 1.8K/Ctn;

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