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)

N-CHANNEL MOSFET

Maximum Ratings

- Operating Junction Temperature Range : -55°C to +175°C
- Storage Temperature Range: -55°C to +175°C
- Thermal Resistance: 0.67°C/W Junction to Case

Applications

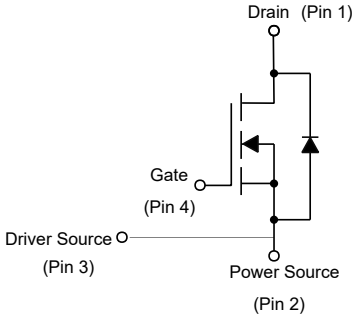
- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Battery Chargers
- Motor Drives

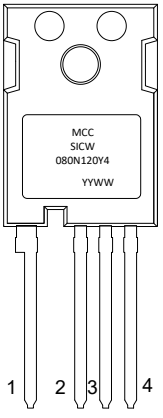
Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	1200	V
Gate-Source Voltage	V_{GSmax}	-8/+22	V
Gate-Source Voltage	V_{GSop}	-4/+18	V
Continuous Drain Current	I_D	39	A
Pulsed Drain Current (1)	I_{DM}	80	A
Total Power Dissipation,Tc=25°C	P_D	223	W
Total Power Dissipation,Tc=110°C	P_D	97	W

Note:

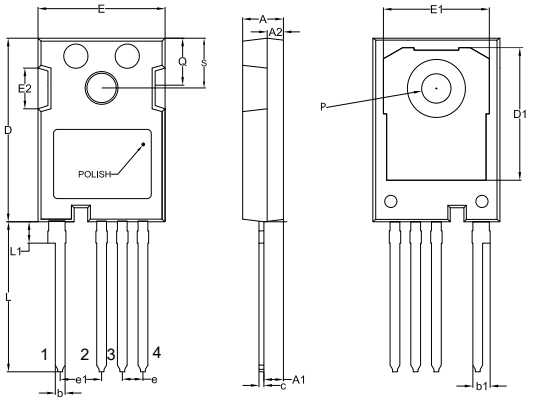
1. Pulse Test: Pulse Width≤10μs,Duty Cycle ≤1%.

Internal Structure





TO-247-4



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.190	0.205	4.80	5.20	
A1	0.090	0.100	2.29	2.50	
A2	0.075	0.082	1.88	2.08	
b	0.042	0.052	1.10	1.30	
b1	0.093	0.108	2.35	2.75	
b2	0.094	0.112	2.39	2.84	
c	0.022	0.027	0.55	0.68	
D	0.917	0.929	23.30	23.60	
D1	0.640	0.663	16.25	16.85	
E	0.620	0.632	15.75	16.05	
E1	0.543	0.559	13.80	14.20	
E2	0.173	0.201	4.4	5.10	
e	0.100		2.54		
L	0.683	0.695	17.34	17.64	
L1	0.157	0.169	4.0	4.3	
P	0.138	0.144	3.51	3.65	Φ
Q	0.220	0.236	5.60	6.00	
S	0.238	0.248	6.04	6.30	

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, Tj =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,Tj =175°C		122		mΩ
Internal Gate Resistance	R_g	f=1MHz		3.1		Ω
Transconductance	g_{FS}	V_{DS}=16V, I_D=20A		10		S
		V_{GS}=16V, I_D=20A,Tj =175°C		9.2		
Diode Characteristics						
Continuous Body Diode Current	I_S			39		A
Diode Forward Voltage	V_{SD}	V_{GS}=-4V, I_S=10A		3.9		V
		V_{DS}=0V, I_{SD}=10A, Tj =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		uJ
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

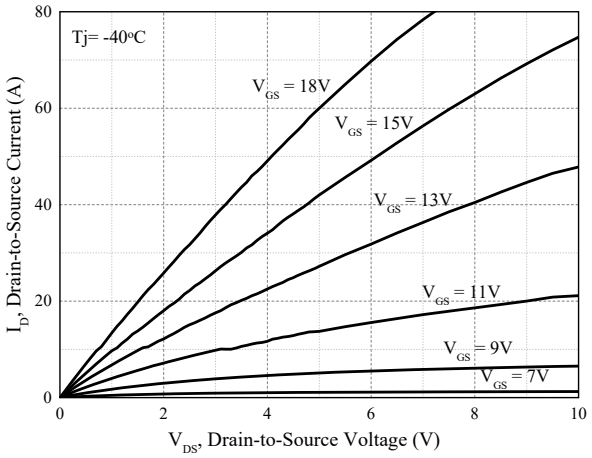


Fig. 2 - Typical Output Characteristics

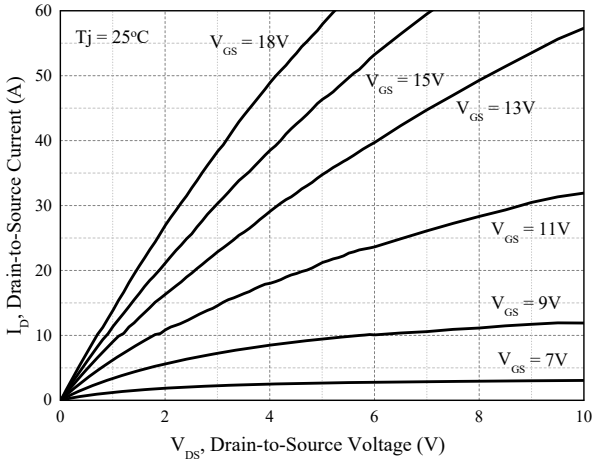


Fig. 3 - Typical Output Characteristics

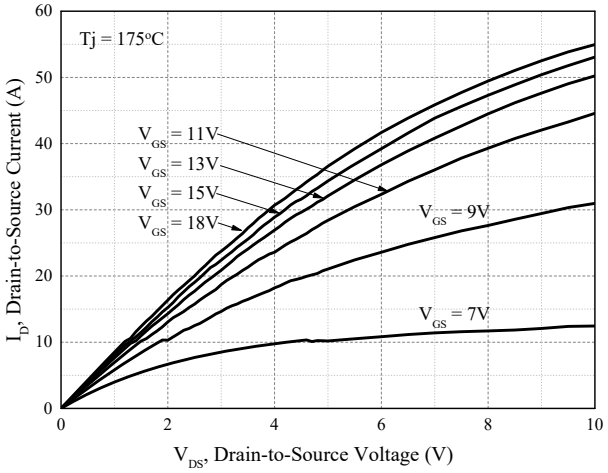


Fig. 4 - Transfer Characteristics for various junction temperature

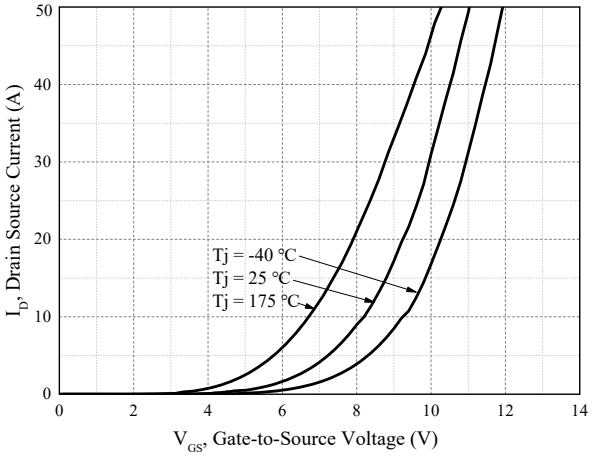


Fig. 5 - On-resistance vs.temperature for various gate voltage

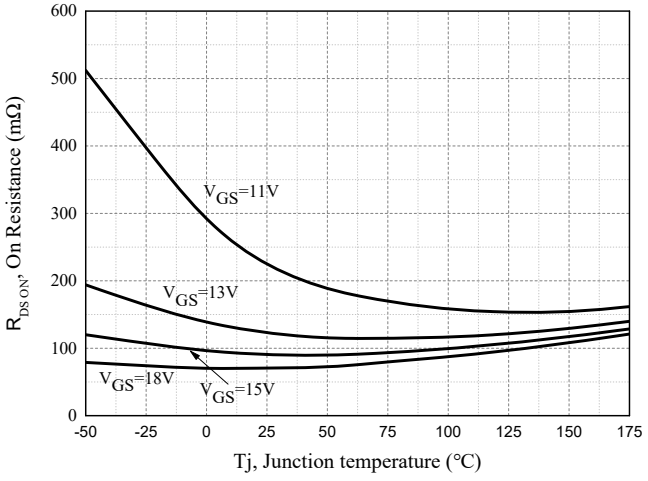
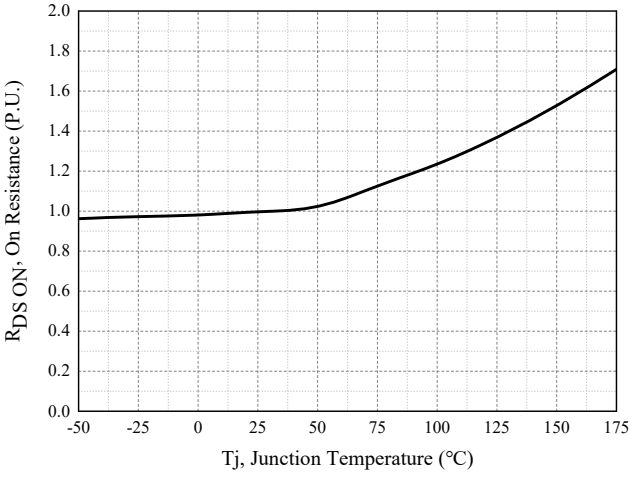


Fig. 6 - Normalized on-resistance vs.temperature



Curve Characteristics

Fig. 7 - On-resistance vs. drain current

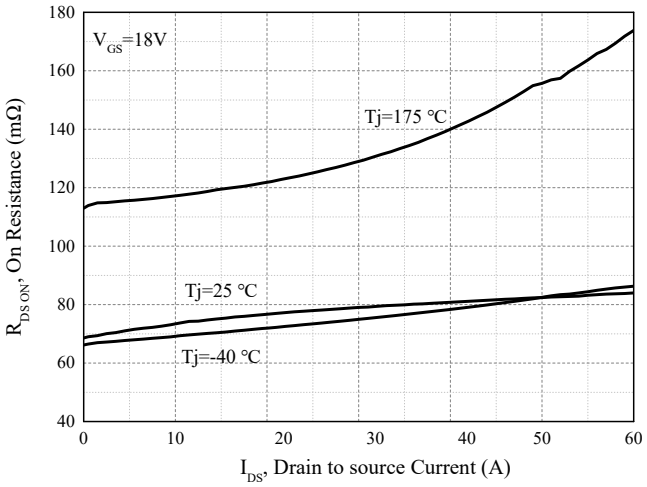


Fig. 8 - Body diode characteristic

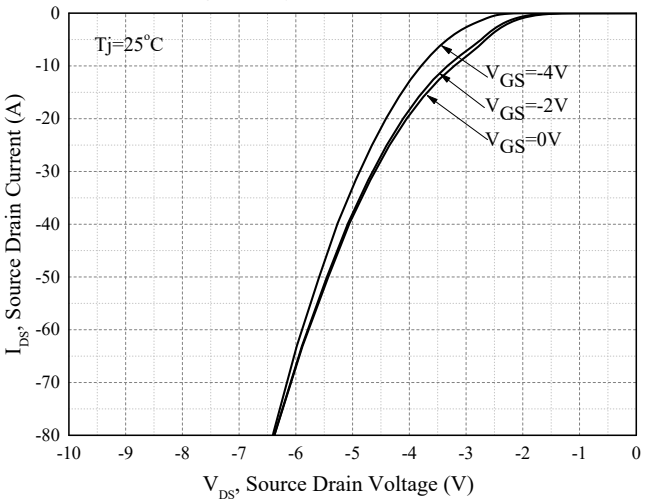


Fig. 9 - Body diode characteristic

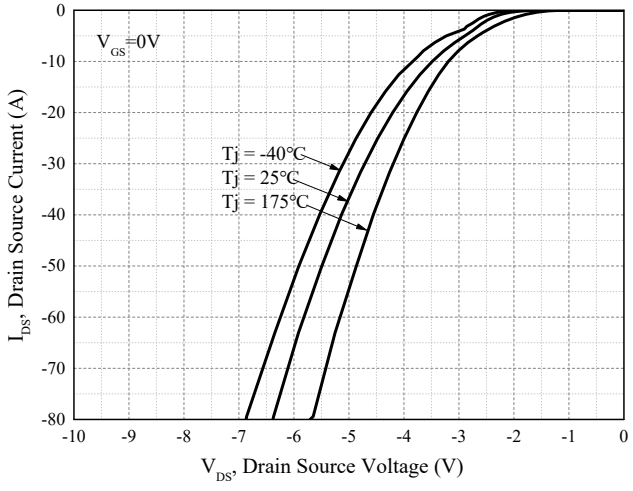


Fig. 10 - 3rd quadrant characteristic at Tj=25ºC

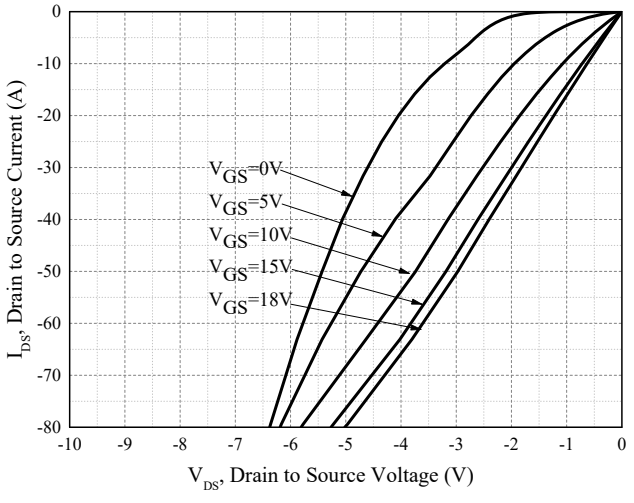


Fig. 11 - Threshold voltage vs.temperature

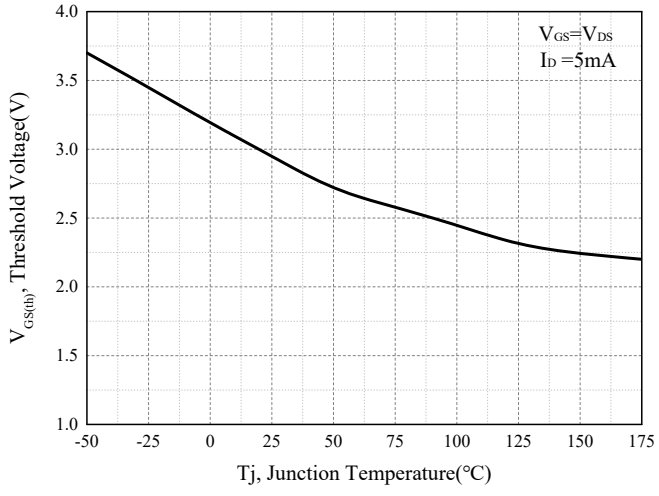
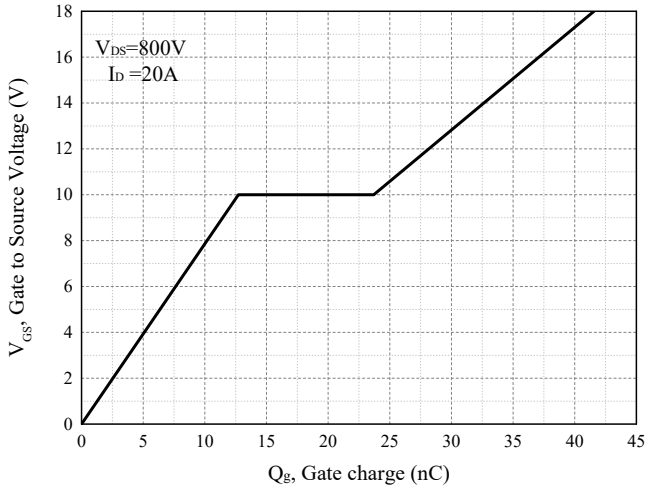


Fig. 12 - Gate charge characteristic



Curve Characteristics

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

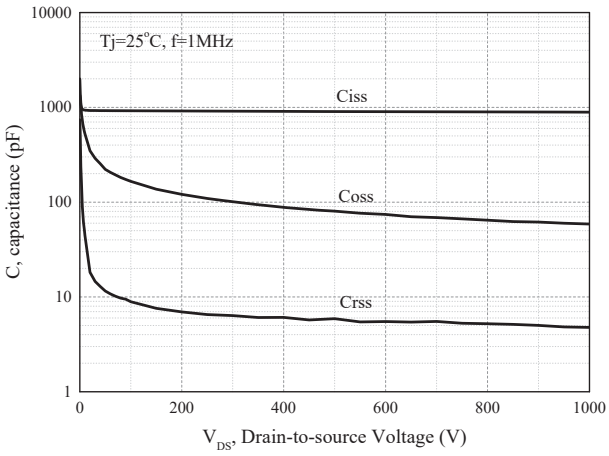


Fig. 14 - Capacitances vs.drain source voltage (0-200V)

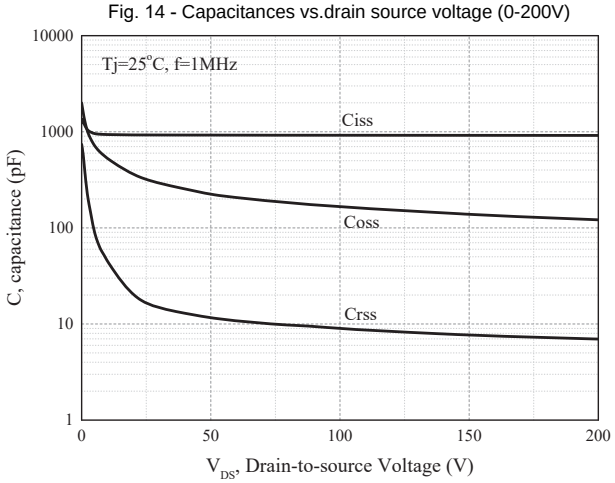


Fig. 15 - Output capacitor stored energy

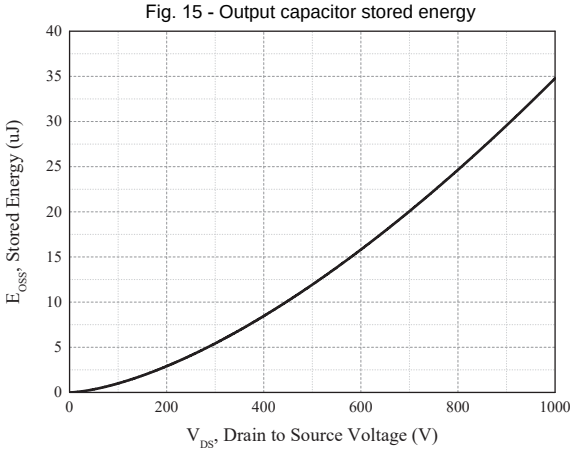


Fig. 16 - Reverse characteristics vs. Tj

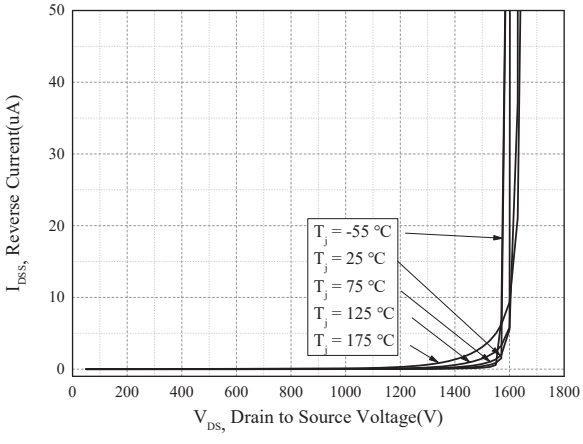


Fig. 17 - Maximum power dissipation derating vs. temperature

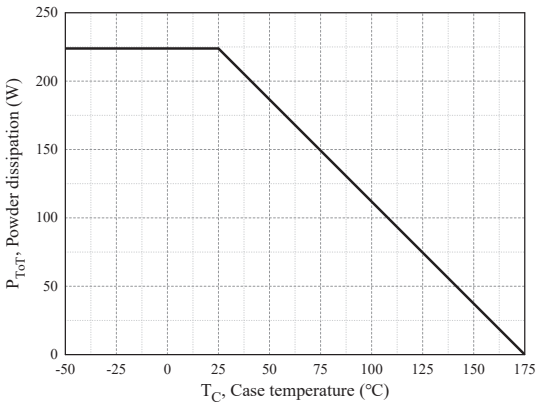
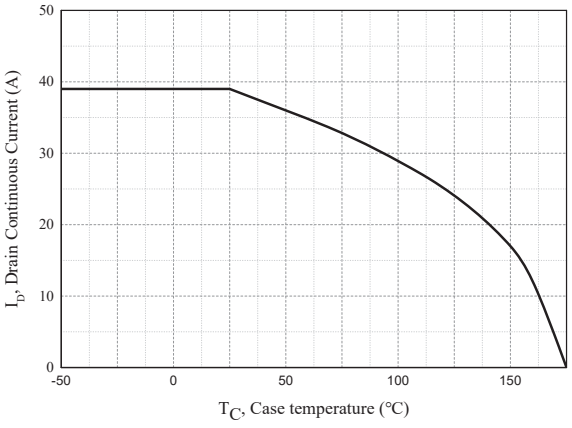


Fig. 18 - Coutinuous drain current derating vs. temperature



Curve Characteristics

Fig. 19 - Transient thermal impedance

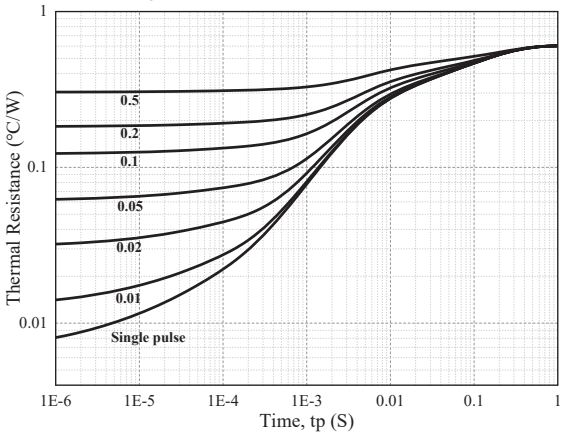


Fig. 20 - Clamped Inductive switching energy vs. drain current

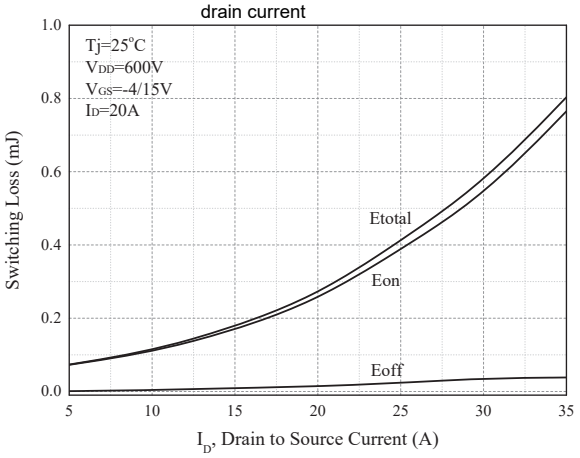


Fig. 21 - Clamped inductive switching energy vs. Rg

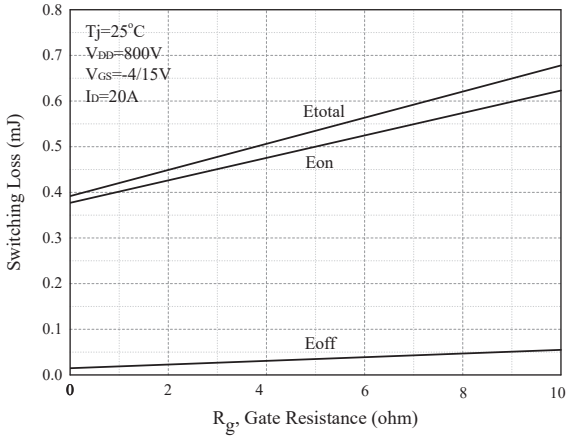


Fig. 22 - Switching times vs. Rg

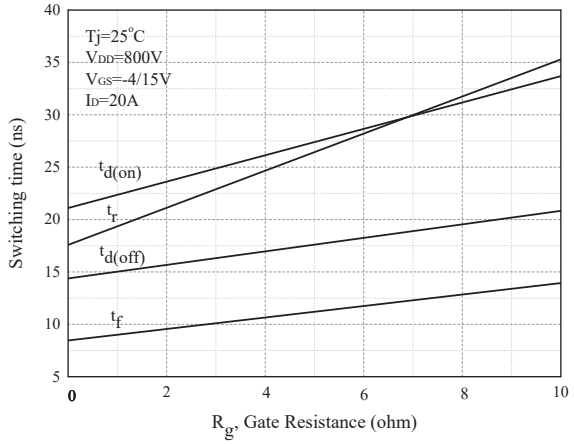
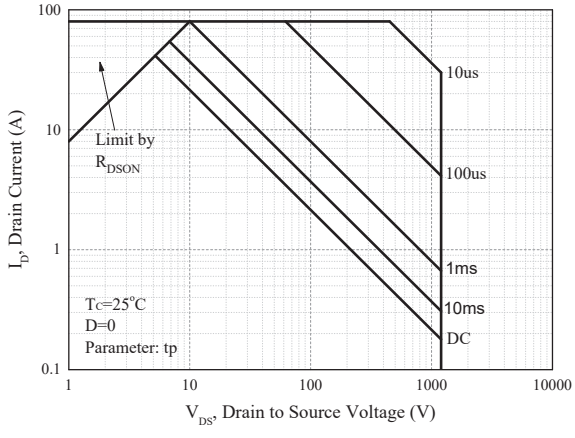


Fig. 23 - Drain to Source Voltage (V)



Ordering Information

Device	Packing
SICW080N120Y4-BP	Tube:30pcs/Tube, 360pcs/Box,1.8K/Ctn;

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