Features

- SiC MOSFET Technology
- High Speed Switching
- Reduction Of Heat Sink Requirements
- Essentially No Switching Losses
- Halogen Free. “Green” Device (Note 1)
- Lead Free Finish/RoHS Compliant("P" Suffix Designates RoHS Compliant. See Ordering Information) (Note2)

SiC N-CHANNEL MOSFET

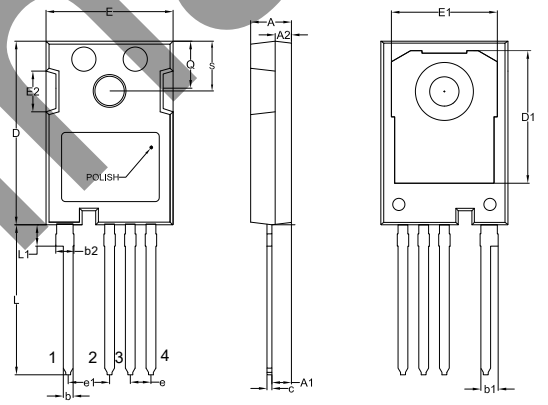
Maximum Ratings

- Operating Junction Temperature Range : -55°C to +175°C
- Storage Temperature Range: -55°C to +175°C
- Thermal Resistance Junction to Ambient,Max(Note 3): 62°C/W
- Thermal Resistance Junction to Case,Typ : 0.41°C/W

Applications

- Solar Inverters
- Uninterruptible Power Supply
- Photovoltaic Inverter
- Battery Chargers
- Motor Drives

TO-247-4

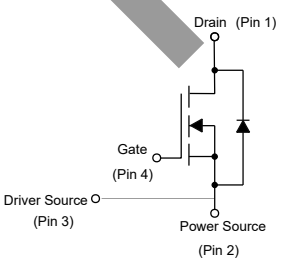


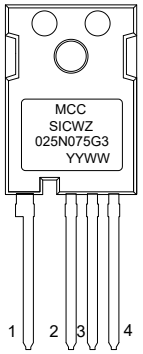
Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	750	V
Gate-Source Voltage(Note 4)		V_{GSmax}	-8/+22	V
Gate-Source Voltage		V_{GSop}	-5/+18	V
Continuous Drain Current V_{GS}=18V	Tc=25°C	I_D	107	A
	Tc=100°C		72	
Pulsed Drain Current (Note 5)		I_{DM}	265	A
Avalanche energy,Single Pulse (Note 6)		E_{AS}	975	mJ
Total Power Dissipation	Tc=25°C	P_D	365	W
	Tc=100°C		182	

DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.189	0.205	4.80	5.20	
A1	0.090	0.098	2.29	2.50	
A2	0.074	0.082	1.88	2.08	
b	0.043	0.054	1.10	1.36	
b1	0.093	0.108	2.35	2.75	
b2	0.094	0.112	2.39	2.84	
c	0.022	0.028	0.55	0.70	
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		
e1	0.199		5.06		
L	0.683	0.694	17.34	17.64	
L1	0.157	0.169	4.00	4.30	
P	0.138	0.148	3.51	3.75	Φ
Q	0.220	0.236	5.60	6.00	
S	0.220	0.248	5.60	6.30	

Note1:Halogen free "Green” products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
Note2:High Temperature Solder Exemptions Applied, see EU Directive Annex 7a.
Note3:Device in a still air environment with TA=25°C.
Note4:AC f > 1Hz, duty cycle < 1%
Note5:Pulse Test: Pulse Width Limited by Tjmax.
Note6:V_{DD}=75V,L=10mH

Internal Structure and Marking Code





Device Code: SICWZ025N075G3

Date Code: YYWW (Year & Week)

Electrical Characteristics @ T_J=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	750			V
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS} =18V		10	100	nA
Drain source leakage current	I_{DSS}	V_{DS}=750V, V_{GS} =0V		10	100	uA
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=15mA	2.0	3.0	4.0	V
		V_{DS}=V_{GS}, I_D=15mA,T_J=175℃		2.3		
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=15V, I_D=40A		25		mΩ
		V_{GS}=18V, I_D=40A		20	27	
		V_{GS}=15V, I_D=40A,T_J=175℃		35		
		V_{GS}=18V, I_D=40A,T_J=175℃		30		
Transconductance	g_{FS}	V_{DS}=20V, I_D=40A		27		S
		V_{DS}=20V, I_D=40A,T_j=175℃		26		
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=500V,V_{GS}=0V, f=1MHz V_{AC}=25mV		4121		pF
Output Capacitance	C_{oss}			173		
Reverse Transfer Capacitance	C_{rss}			8.2		
Coss Stored Energy	E_{oss}			95		μJ
Total Gate Charge	Q_g	V_{DS}=500V,V_{GS}=-5/+18V, I_D=40A		147		nC
Gate-Source Charge	Q_{gs}			40		
Gate-Drain Charge	Q_{gd}			69		
Internal Gate Resistance	R_g	f=1MHz		2		Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=500V, V_{GS}=-5/+18V, R_G=2.4Ω, I_D=40A,L=100uH		18		ns
Turn-On Rise Time	t_r			20		
Turn-Off Delay Time	$t_{d(off)}$			30		
Turn-Off Fall Time	t_f			12		
Turn-On switching energy	E_{on}			125		μJ
Turn-Off switching energy	E_{off}			74		
Diode Characteristics						
Maximum Continuous Diode Forward Current	I_S	V_{GS}=-5V, T_C=25℃		89		A
Diode Forward Voltage	V_{SD}	V_{GS}=-5V, I_{SD}=20A		4.8		V
		V_{GS}=0V, I_{SD}=20A,T_j=175℃		3.0		V
Reverse Recovery Time	t_{rr}	I_{SD}=40A, V_R=500V, V_{GS}=-5V dI_F/dt=1000A/μs		22		ns
Reverse Recovery Charge	Q_{rr}			174		nC
Peak reverse recovery current	I_{rrm}			12		A

Curve Characteristics(T_J=25℃ unless otherwise specified)

Figure 1. Output Characteristics Tj = -55℃

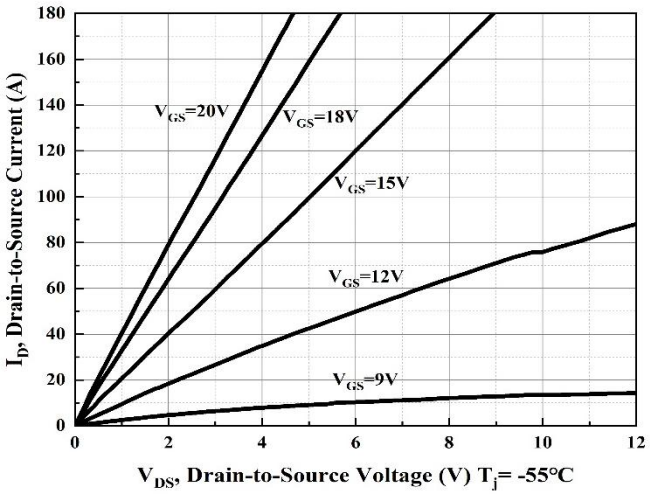


Figure2. Output Characteristics Tj = 25℃

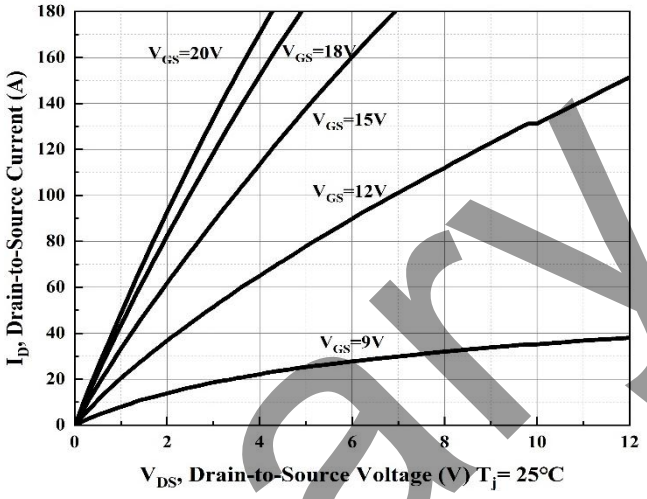


Figure 3. Output Characteristics Tj = 175℃

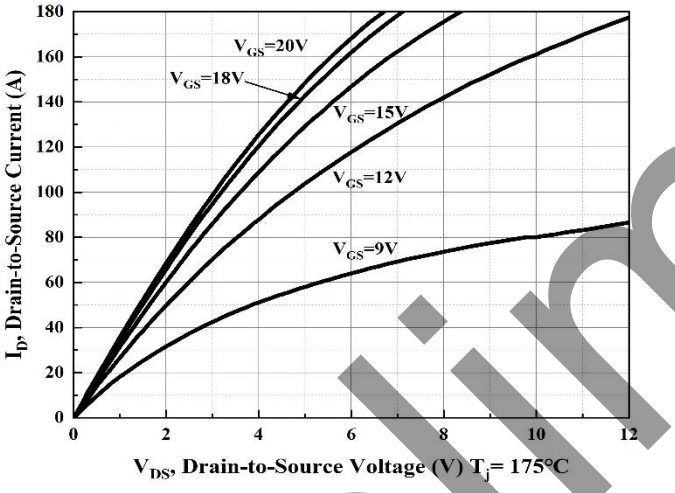


Figure 4. Transfer Characteristics

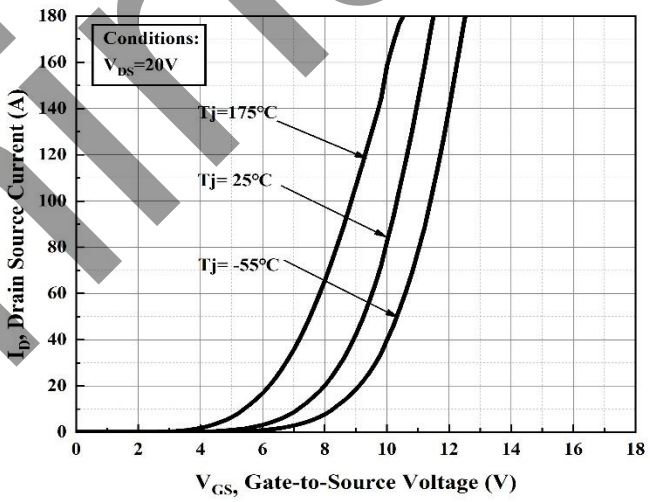


Figure 5. On-resistance vs. Temperature

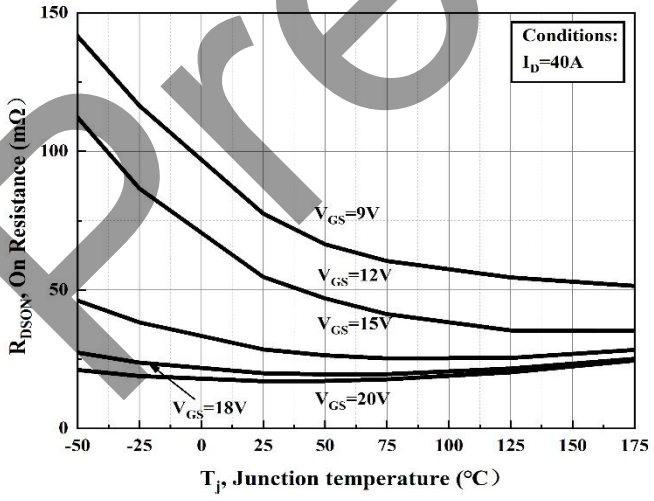
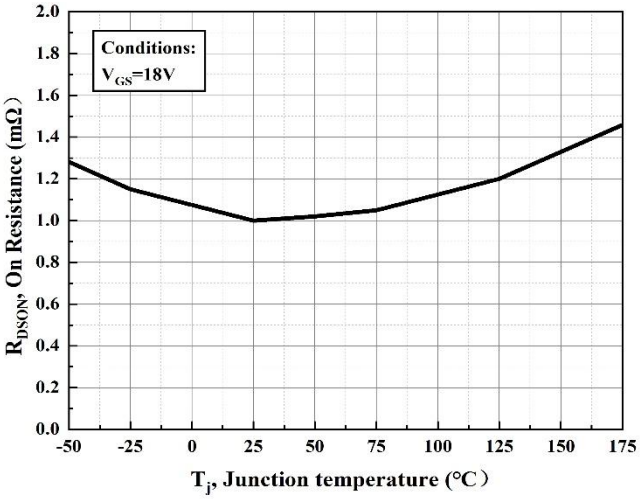


Figure 6. Normalized on-resistance vs. Temperature



Curve Characteristics(T_J=25℃ unless otherwise specified)

Figure 7. On-resistance vs. Drain Current

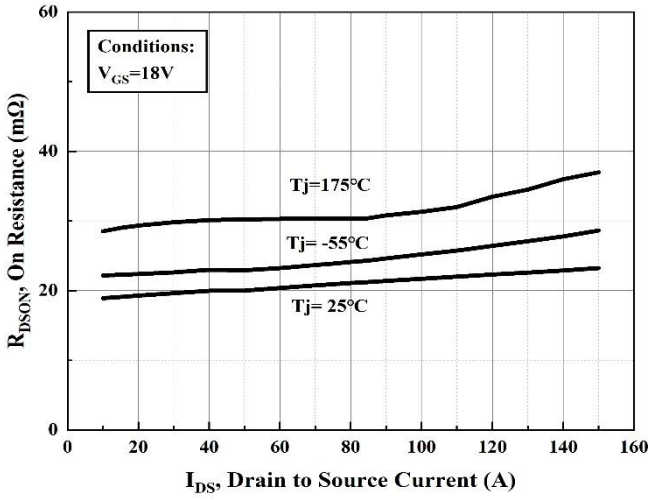


Figure 8. Body Diode Characteristic at Tj= 25 ℃

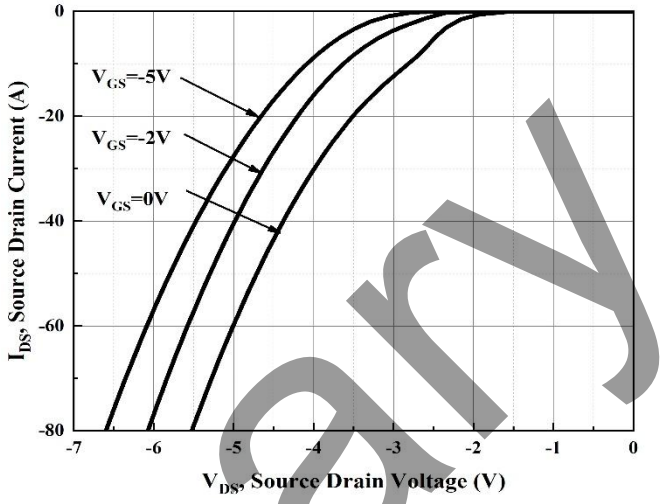


Figure 9. Body Diode Characteristic

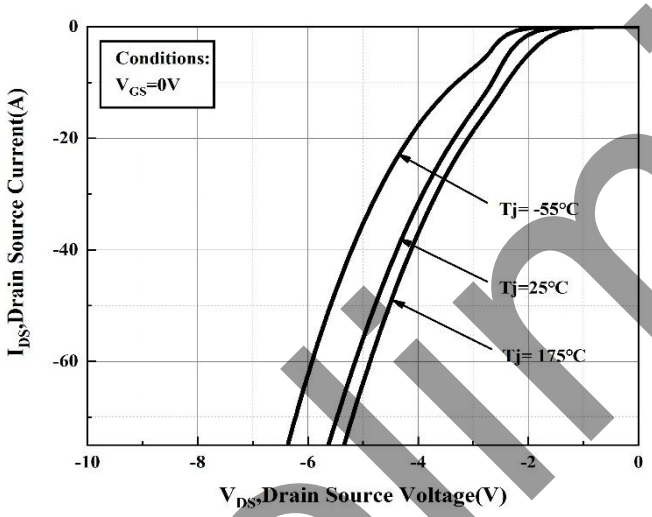


Figure 10. 3rd quadrant Characteristic at Tj= 25 ℃

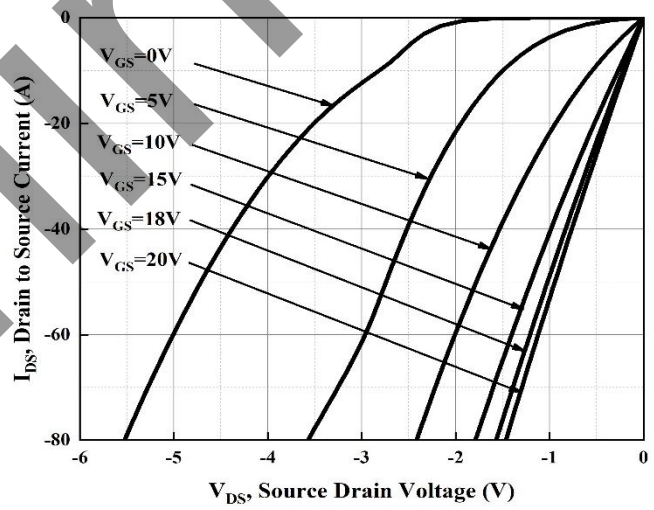


Figure 11. Threshold Voltage vs. Temperature

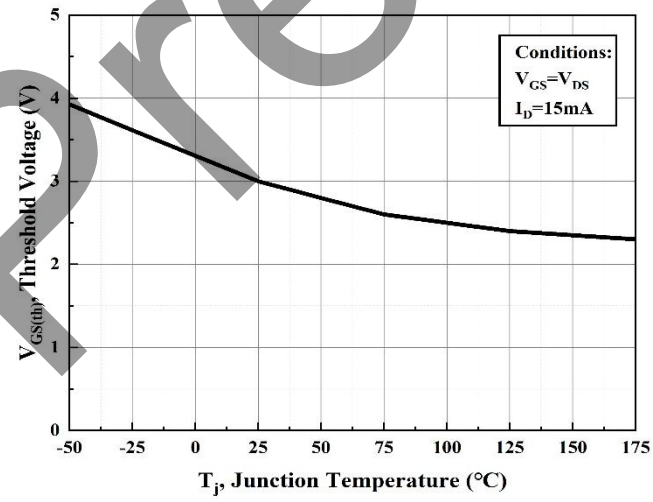
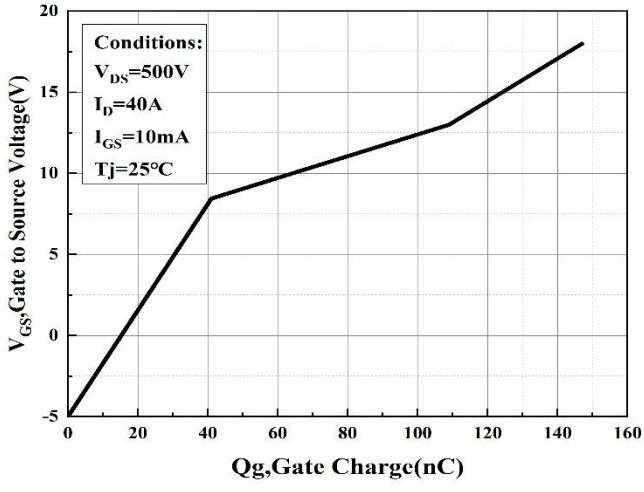


Figure 12. Gate Charge Characteristic



Curve Characteristics(T_J=25℃ unless otherwise specified)

Figure 13. Capacitances vs. Drain Source Voltage (0-650V)

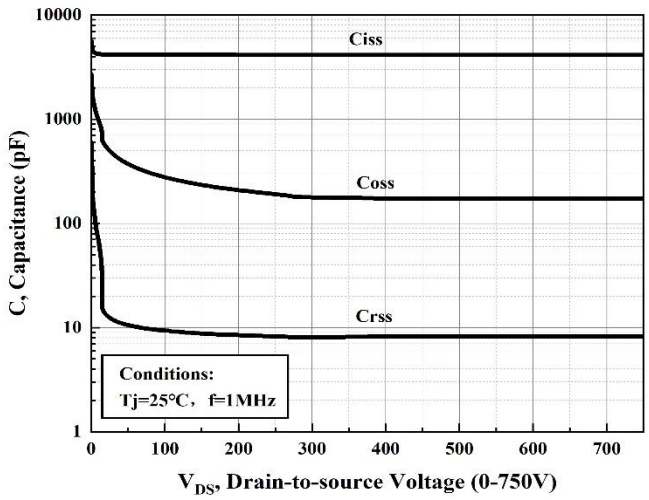


Figure 14. Capacitances vs. Drain Source Voltage (0-200V)

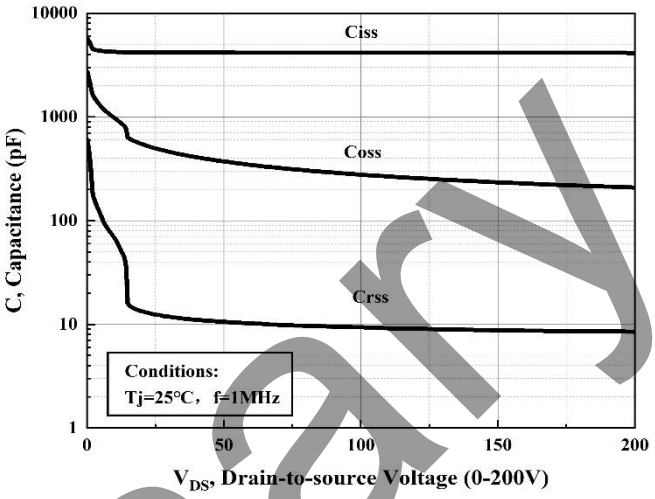


Figure 15. Output Capacitor Stored Energy

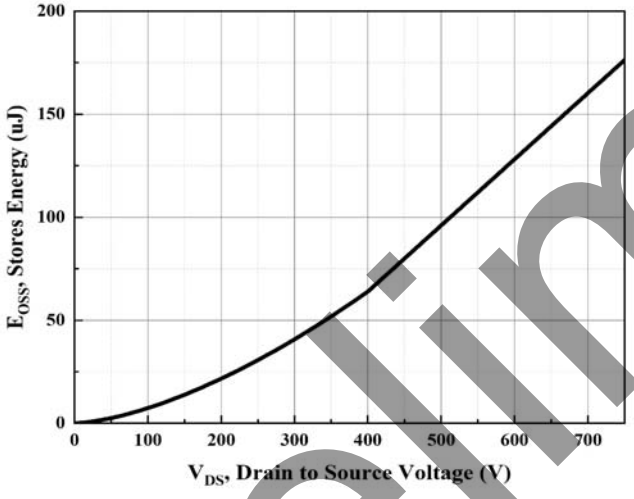


Figure 16. Power Dissipation Derating

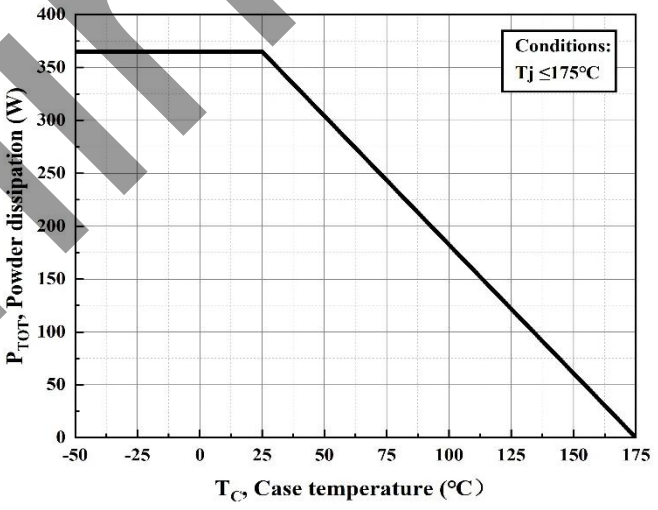


Figure 17. Drain Current Derating

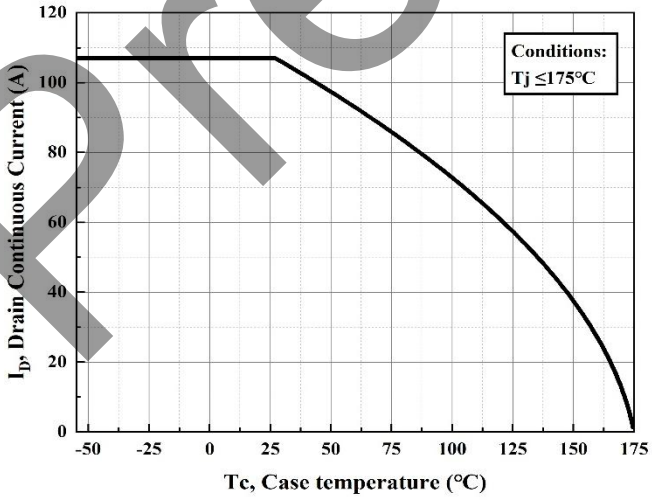
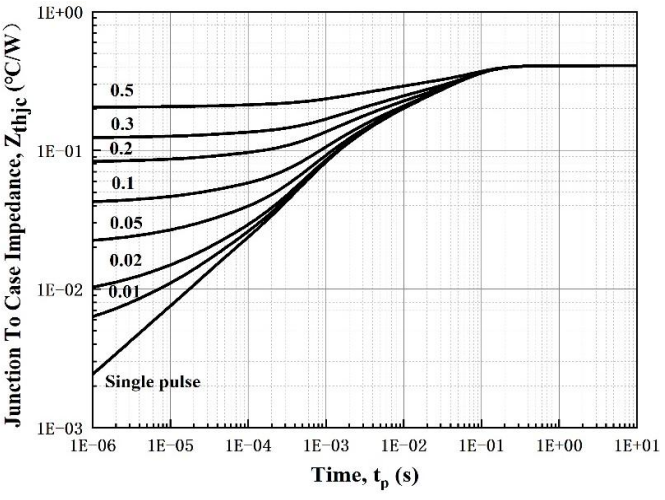


Figure18 Transient Thermal Impedance (Junction - Case)



Curve Characteristics(T_J=25℃ unless otherwise specified)

Figure 19. Clamped Inductive Switching Energy vs. Darin Current

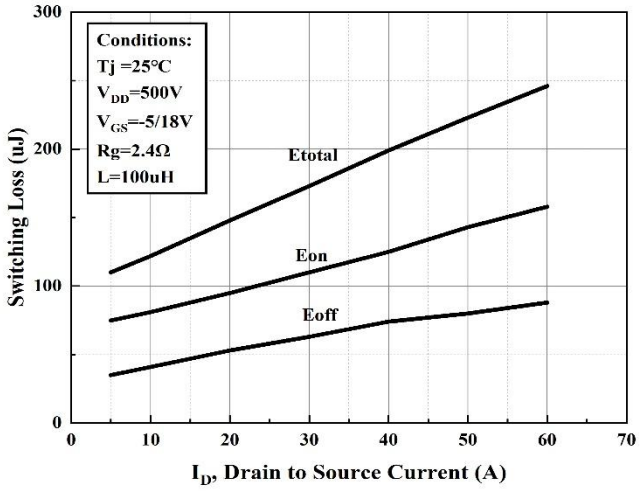


Figure 20. Clamped Inductive Switching Energy vs. Rg

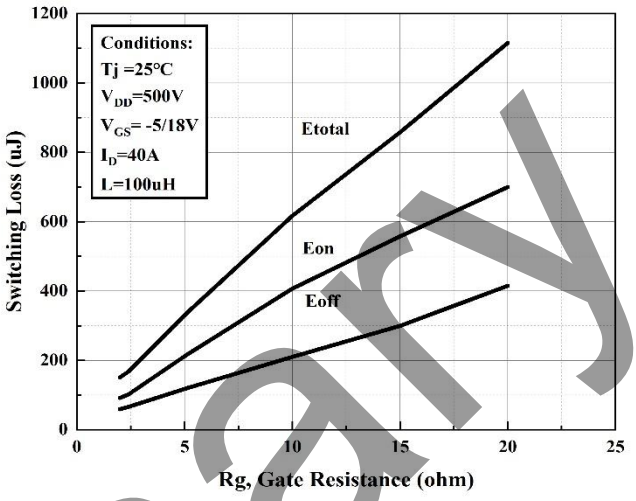


Figure 21. Switching Times vs. Rg

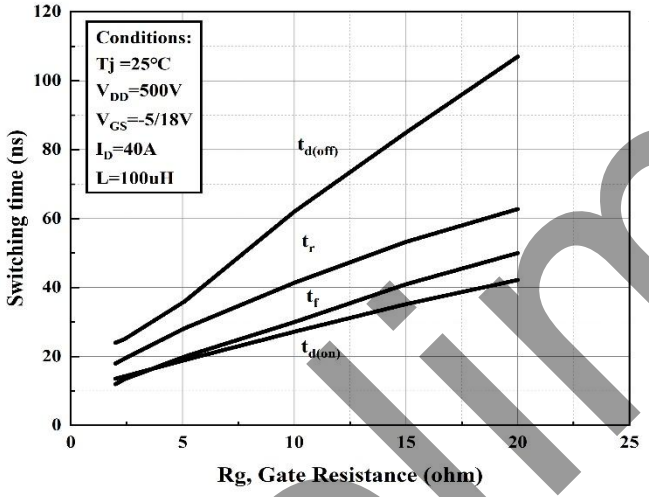
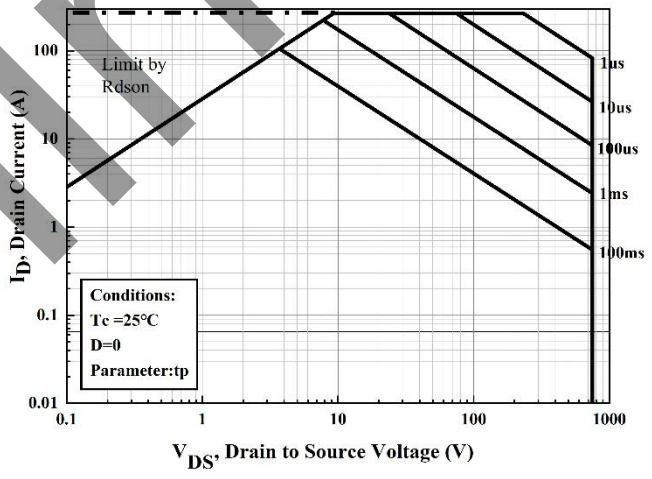


Figure 22. Safe Operating Area



Ordering Information

Device	Packing
Part Number-BP	Tube:30pcs/Tube, 1.8K/Ctn;