

VDS	RDS(on)	ID@25℃
1200V	30mΩ	68A

Applications:

- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- EV Charging
- Motor Drives

Features:

- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitances
- Easy to Parallel and Simple to Drive
- Avalanche Ruggedness

Benefits:

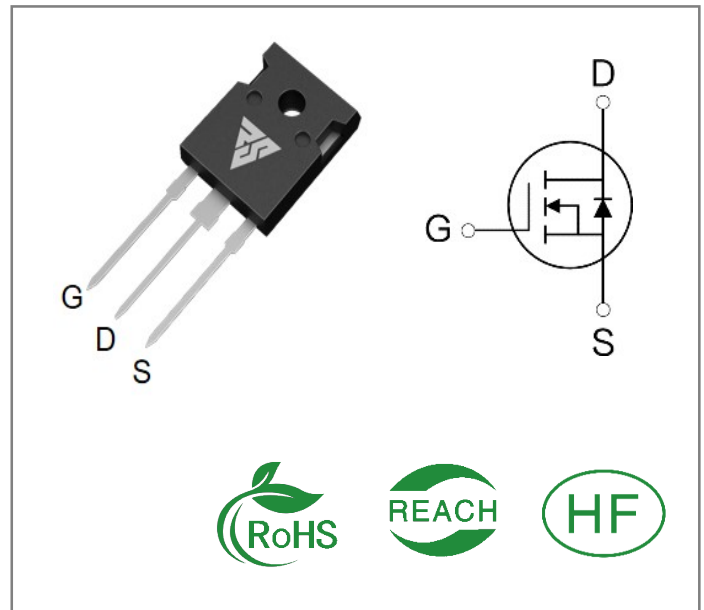
- Higher System Efficiency
- Reduced Cooling Requirements
- Increased Power Density
- Increased System Switching Frequency

Ordering Information

Part Number	Package	Marking	Packing	Qty.
RSM120030W	TO-247-3	RSM120030W	Tube	30 PCS

Maximum Ratings (TJ= 25℃ unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
VDSmax	Drain - Source Voltage	1200	V	VGS=0V, ID =100μA	
VGSmax	Gate - Source Voltage	-8/+22	V	Absolute maximum values	
VGSop	Gate - Source Voltage	-4/+18	V	Recommended operational values	
ID	Continuous Drain Current	68 47	A	VGS=18V, TC =25℃ VGS=18V, TC =100℃	
ID(pulse)	Pulsed Drain Current	120	A	Pulse width tp limited by TJmax	
PD	Power Dissipation	334	W	TC =25℃, TJ =175℃	
TL	Solder Temperature	260	℃		
TJ, Tstg	Operating Junction and Storage Temperature	-55 to + 175	℃		



Electrical Characteristics (T_J= 25°C unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
V(BR)DSS	Drain-Source Breakdown Voltage	1200			V	VGS=0V, ID =100μA	
VGS(th)	Gate Threshold Voltage	1.9	2.6	4.0	V	VGS= VDS, IDS=11.5mA, TC =25°C	
			1.8		V	VGS= VDS, IDS=11.5mA, TC =175°C	
IDSS	Zero Gate Voltage Drain Current		1	100	μA	VDS= 1200V, VGS=0V	
IGSS	Gate-Source Leakage Current		10	250	nA	VGS=22V, VDS= 0V	
RDS(on)	Drain-Source on-state Resistance		30	42	mΩ	VGS=18V, ID =40A, TC =25°C	
			62	80	mΩ	VGS=18V, ID =40A, TC =175°C	
Ciss	Input Capacitance		2680		pF	VGS=0V, VDS=1000 V, f=1MHz, VAC=25 mV	
Coss	Output Capacitance		113				
Crss	Reverse Transfer Capacitance		17				
EON	Turn-On Switching Energy		1096		μJ	VDS =800V, VGS =-4/18V, ID = 40A, RG(ext) = 2.5Ω, L= 100μH	
EOFF	Turn-Off Energy		335				
td(on)	Turn-On Delay Time		26.4		ns	VDS =800V, VGS =-4/18 V ID = 40A, RG(ext) =2. 5 Ω , RL =20Ω	
tr	Rise Time		17.6				
td(off)	Turn-Off Delay Time		50				
tf	Fall Time		11				
RG(int)	Internal Gate Resistance		3.3		Ω	f=1 MHz, VAC=25mV	
Qgs	Gate to Source Charge		31		nC	VDS=800V, VGS=-4/18V ID =40A	
Qgd	Gate to Drain Charge		27.4				
Qg	Total Gate Charge		102				

Reverse Diode Characteristics (T_J= 25°C unless otherwise specified)

Symbol	Parameter	Typ.	Max	Unit	Test Conditions	Note
VSD	Diode Forward Voltage	4.2		V	VGS=-4V, ISD = 20A, T _J = 25°C	
		3.9		V	VGS=-4V, ISD=20 A, T _J = 175°C	
IS	Continuous Diode Forward Current		68	A	TC= 25°C	
trr	Reverse Recovery time	23		ns	ISD= 40 A, VR = 800V	
Qrr	Reverse Recovery Charge	110		nC		
Irrm	Peak Reverse Recovery Current	3.1		A		

Thermal Characteristics (T_J= 25°C unless otherwise specified)

Symbol	Parameter	Typ.	Unit	Test Conditions	Note
R _{θJC}	Thermal Resistance from Junction to Case	0.35	°C/W		
R _{θJA}	Thermal Resistance From Junction to Ambient	40			

Typical Feature Curve

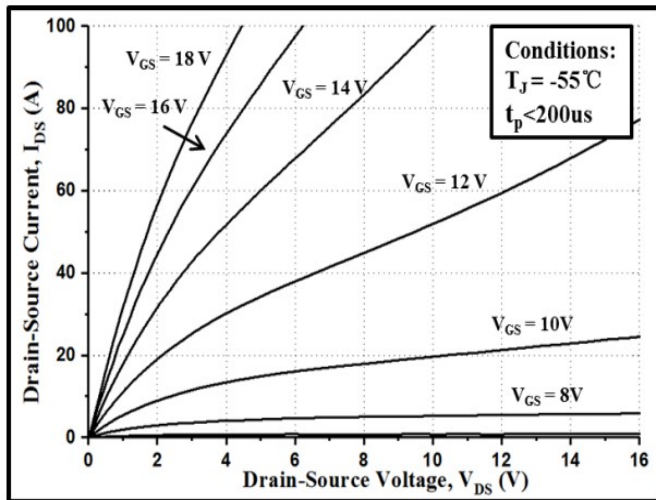


Figure 1. Output Characteristics $T_J = -55^\circ\text{C}$

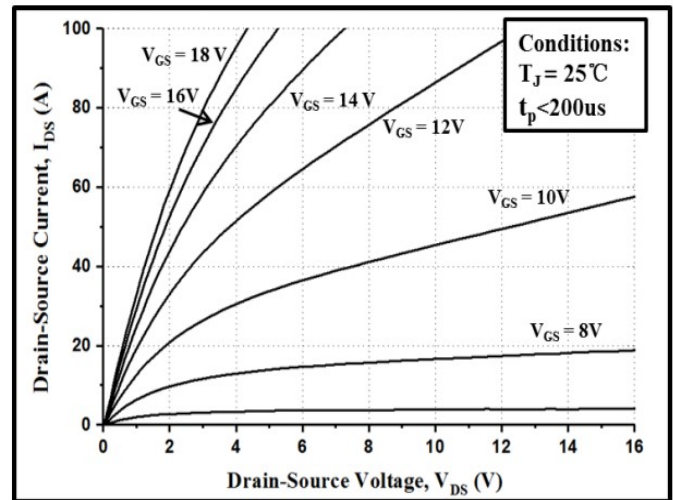


Figure 2. Output Characteristics $T_J = 25^\circ\text{C}$

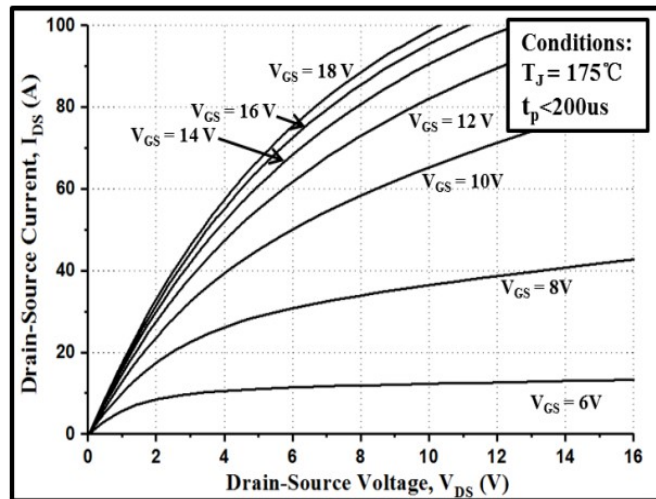


Figure 3. Output Characteristics $T_J = 175^\circ\text{C}$

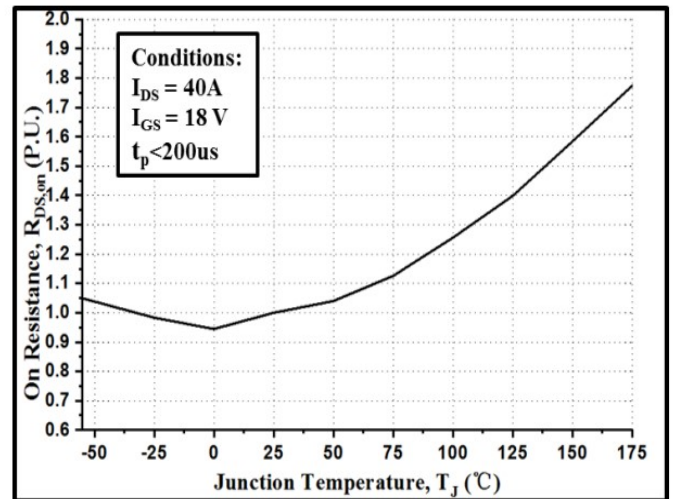


Figure 4. Normalized On-Resistance vs. Temperature

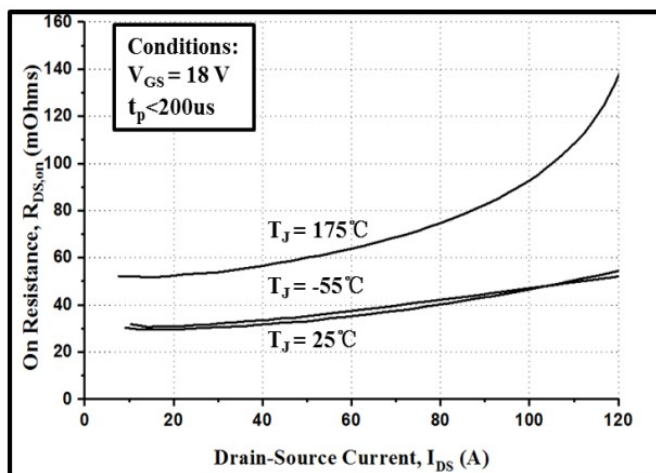


Figure 5. On-Resistance vs. Drain Current
For Various Temperatures

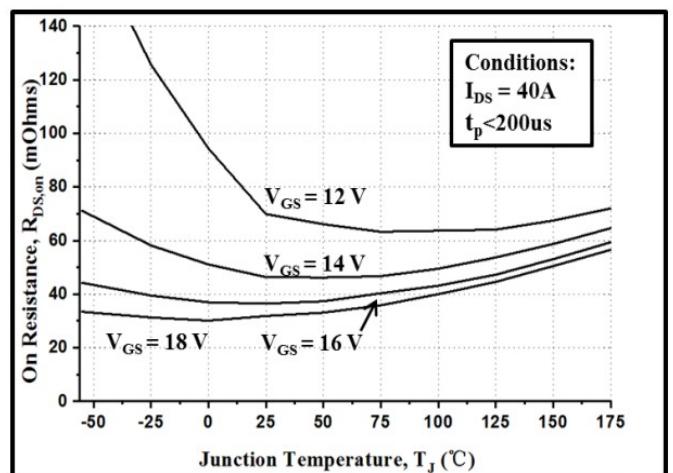


Figure 6. On-Resistance vs. Temperature
For Various Gate Voltage

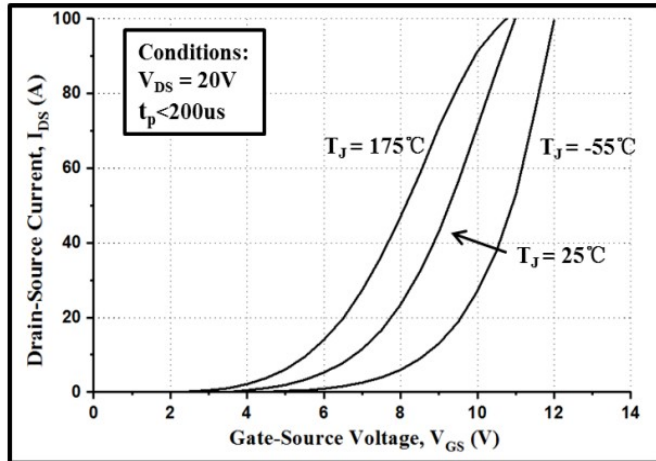


Figure 7. Transfer Characteristic for Various Junction Temperatures

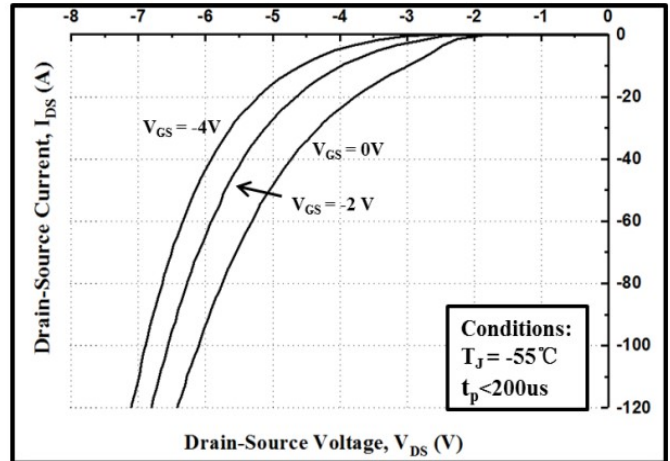


Figure 8. Body Diode Characteristic at $-55^\circ C$

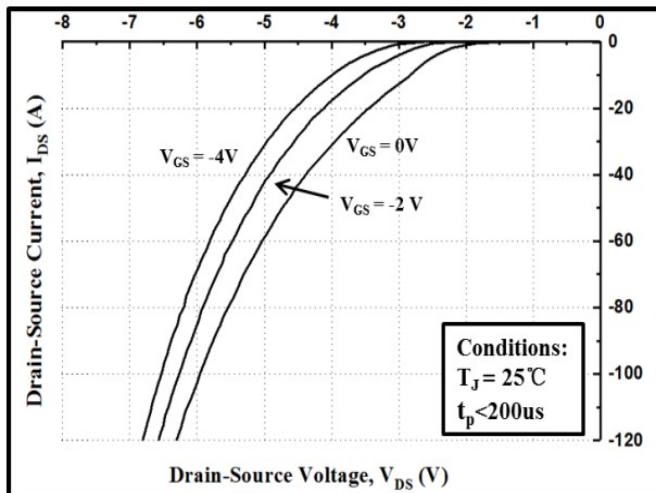


Figure 9. Body Diode Characteristic at $25^\circ C$

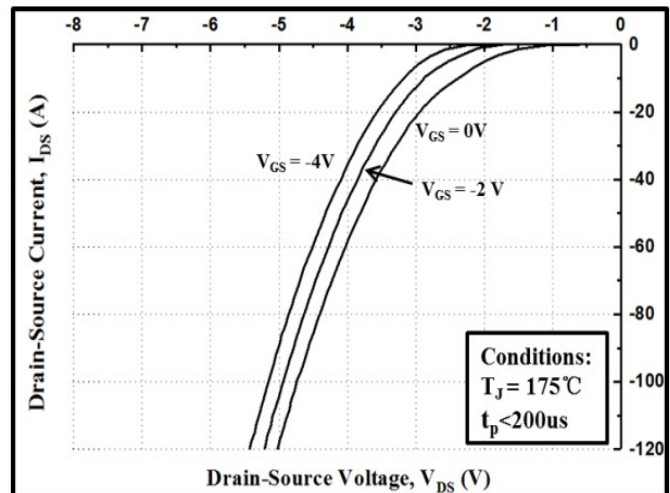


Figure 10. Body Diode Characteristic at $175^\circ C$

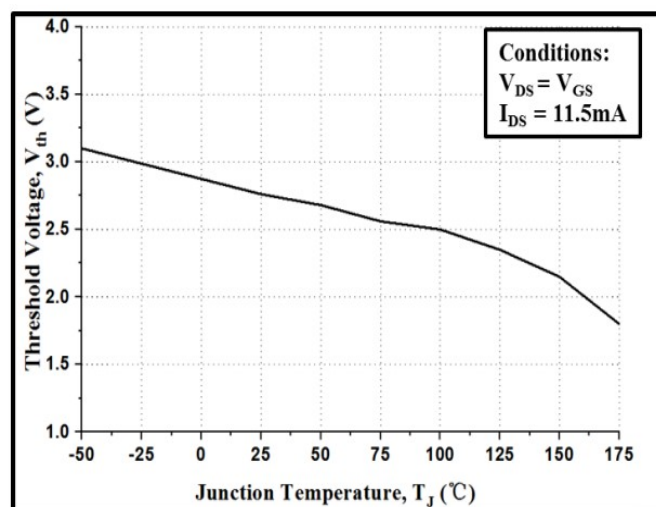


Figure 11. Threshold Voltage vs. Temperature

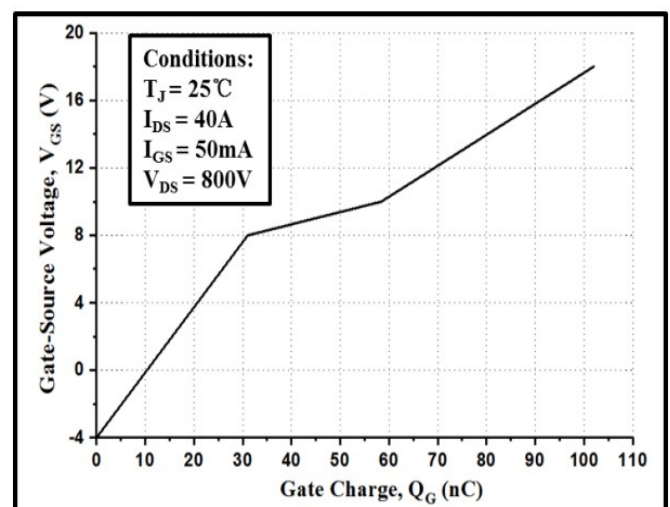


Figure 12. Gate Charge Characteristics

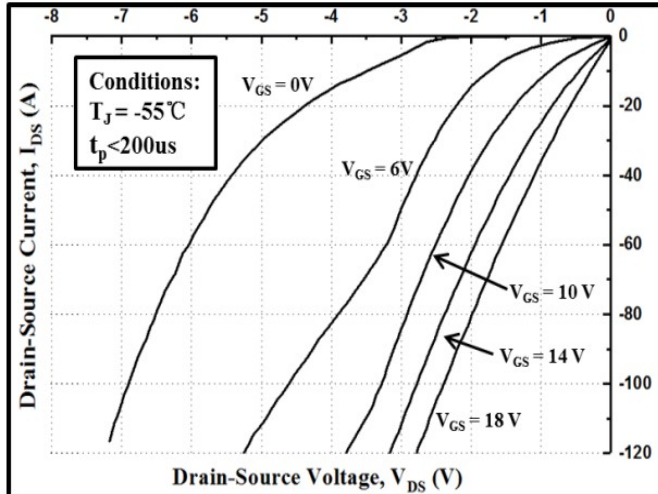


Figure 13. 3rd Quadrant Characteristic at -55°C

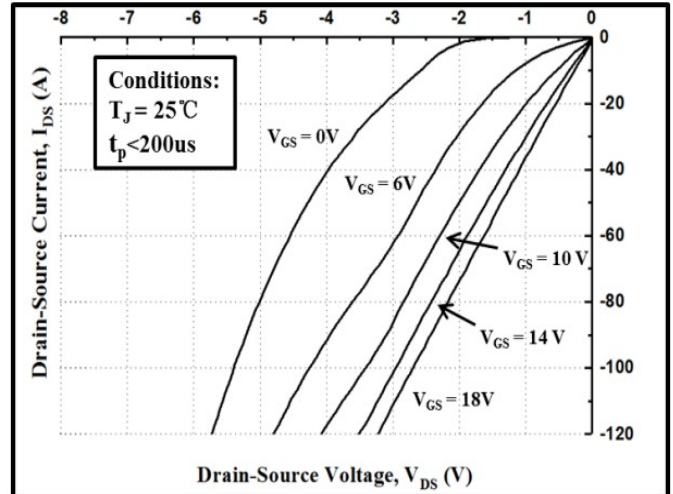


Figure 14. 3rd Quadrant Characteristic at 25°C

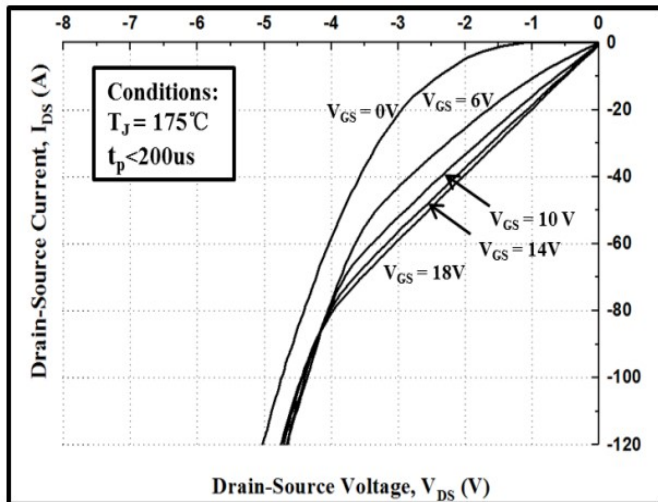


Figure 15. 3rd Quadrant Characteristic at 175 °C

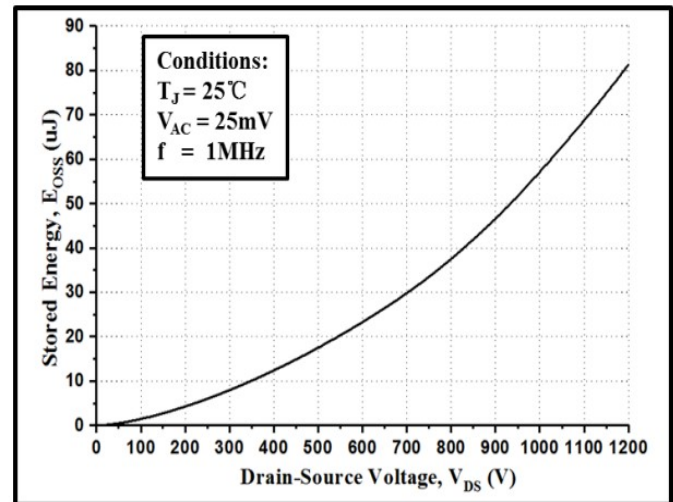


Figure 16. Output Capacitor Stored Energy

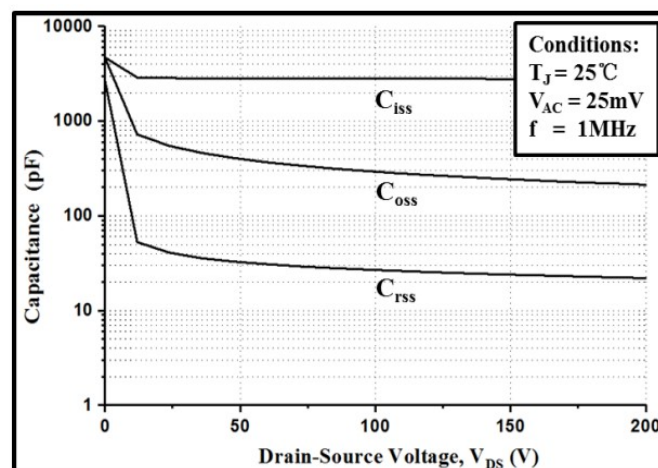


Figure 17. Capacitances vs. Drain-Source Voltage (0 - 200V)

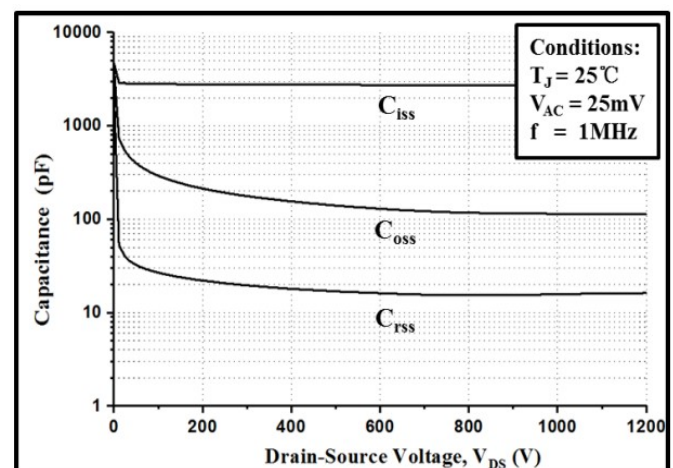


Figure 18. Capacitances vs. Drain-Source Voltage (0 - 1200V)

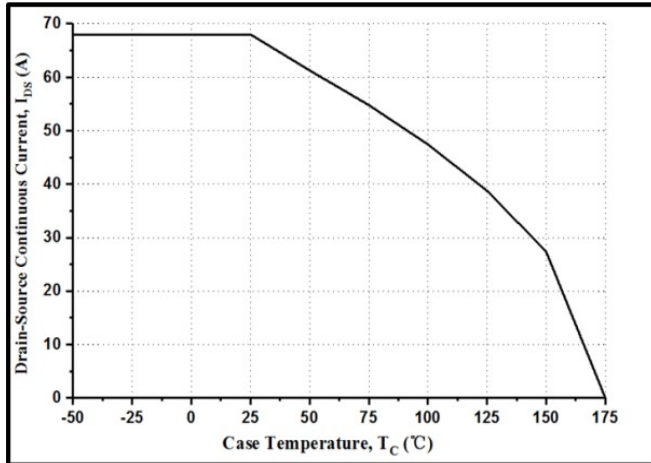


Figure 19. Continuous Drain Current Derating vs. Case Temperature

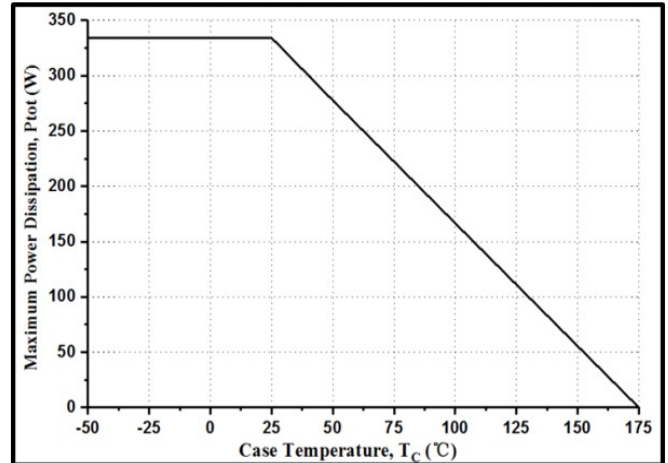


Figure 20. Maximum Power Dissipation Derating vs. Case Temperature

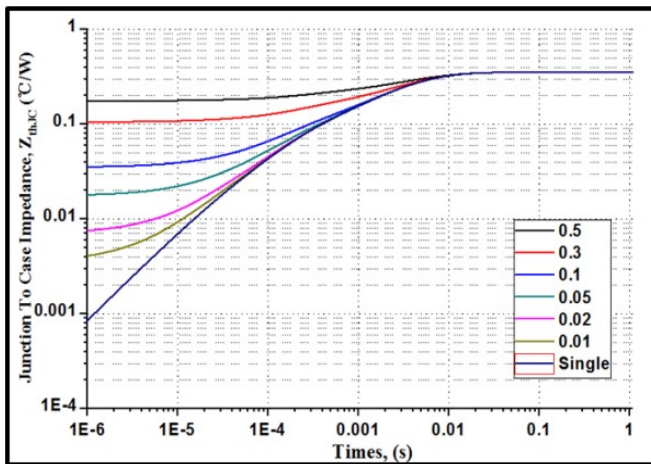


Figure 21. Transient Thermal Impedance (Junction - Case)

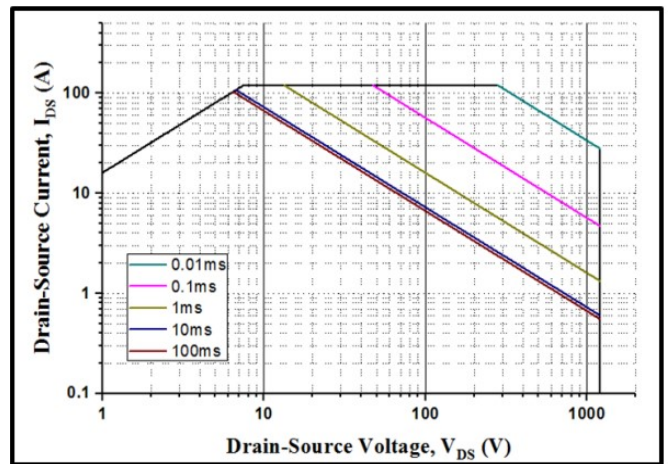


Figure 22. Safe Operating Area

Test Circuit Schematic

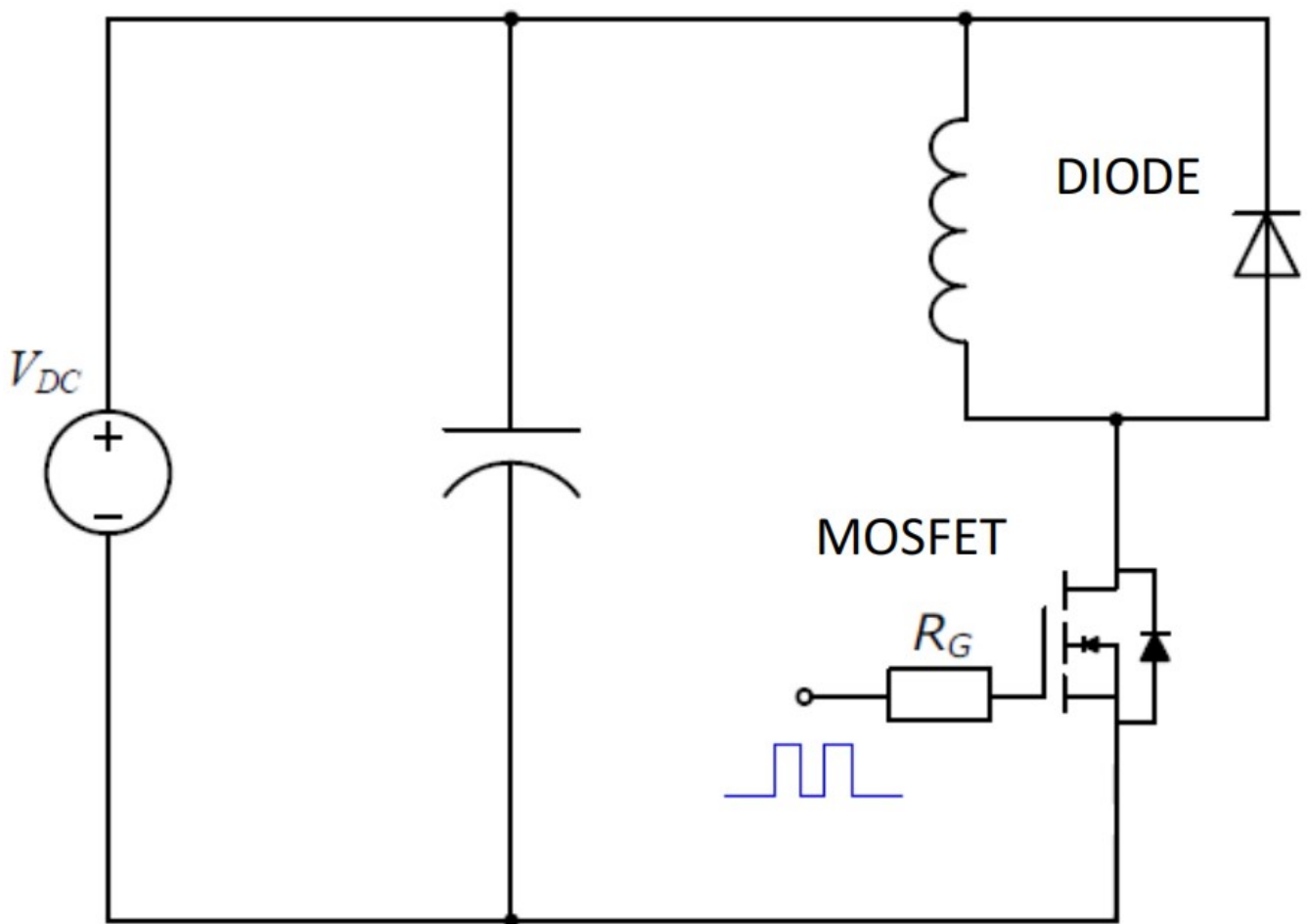
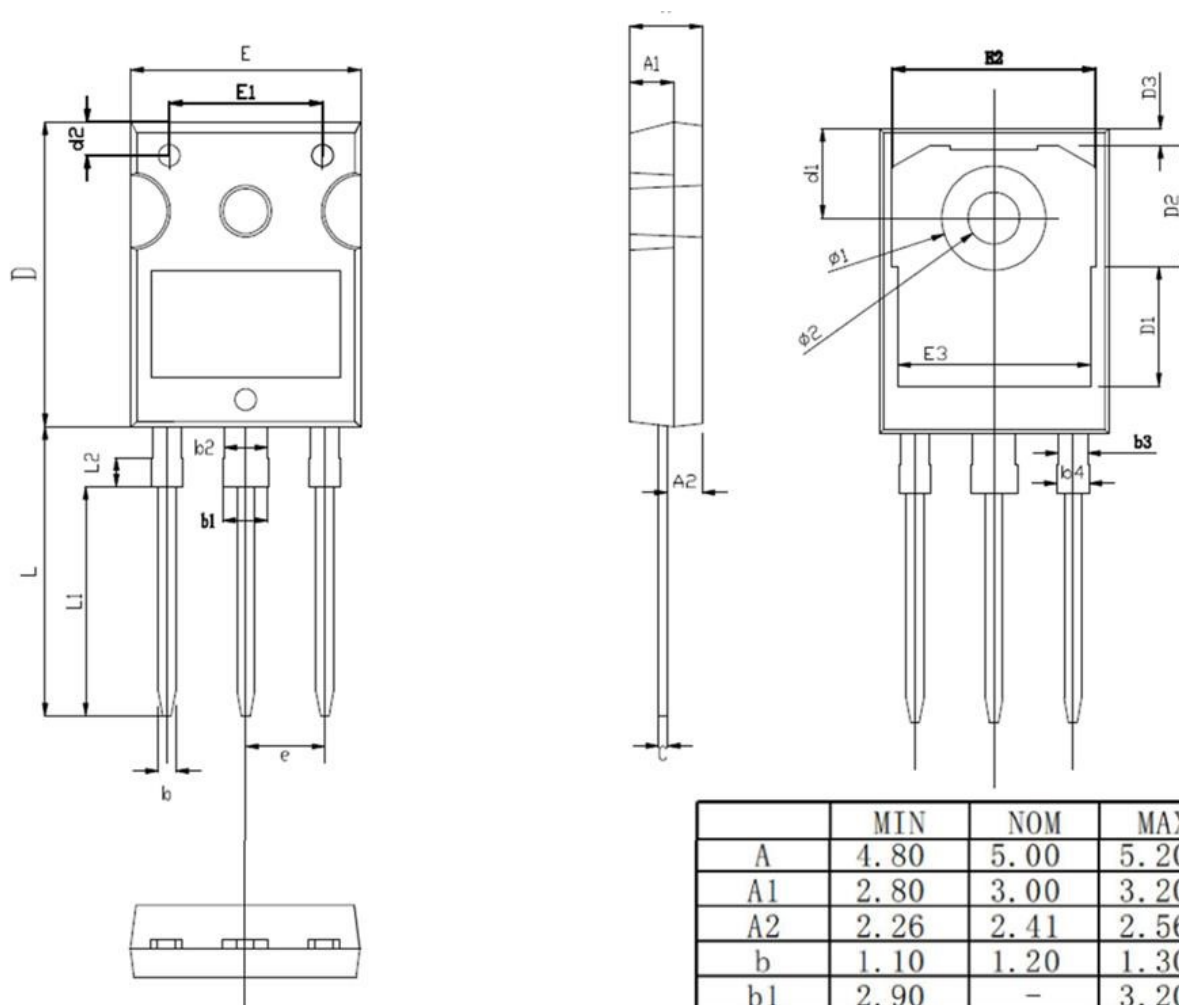
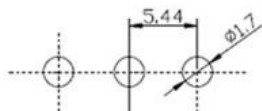


Figure 23. Clamped Inductive Switching
Waveform Test Circuit

Package outline drawing(TO-247-3 Unit: mm)



RECOMMENDED LAND PATTERN



UNIT: mm

	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.80	3.00	3.20
A2	2.26	2.41	2.56
b	1.10	1.20	1.30
b1	2.90	-	3.20
b2	2.90	3.00	3.10
b3	1.90	2.00	2.10
b4	2.00	-	2.20
c	0.50	0.60	0.70
D	20.80	21.00	21.20
D1		8.23	
D2		8.32	
D3		1.17	
d1	6.00	6.15	6.30
d2	2.20	2.30	2.40
E	15.60	15.80	16.00
E1		10.50	
E2		14.02	
E3		13.50	
e	5.34	5.44	5.54
L	19.72	19.92	20.12
L1		15.79	
L2		1.98	
ø1	7.10	7.19	7.30
ø2	3.50	3.60	3.70

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