

VDS	RDS(on)	ID@25°C
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:

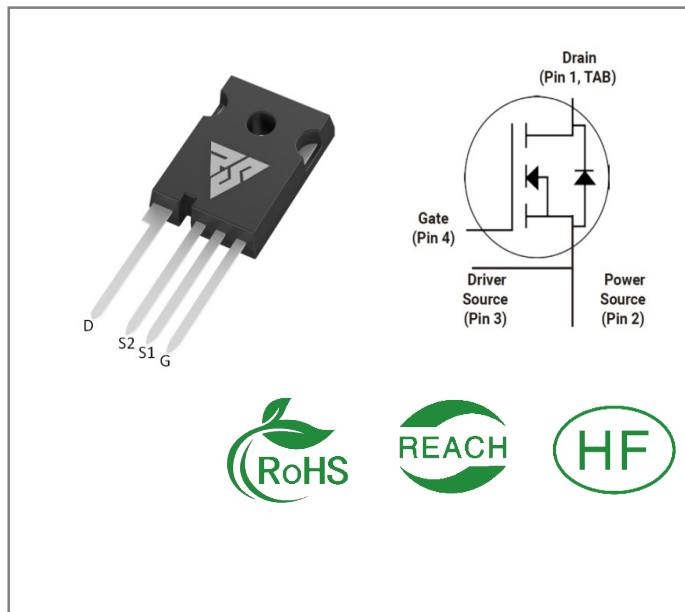
- Higher System Efficiency
- Reduced Cooling Requirements
- Increased Power Density
- Increased System Switching Frequency

Ordering Information

Part Number	Package	Marking	Packing	Qty.
RSM120030Z	TO-247-4	RSM120030Z	Tube	30 PCS

Maximum Ratings (TJ= 25°C 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°C VGS=18V, TC =100°C	
ID(pulse)	Pulsed Drain Current	120	A	Pulse width tp limited by TJmax	
PD	Power Dissipation	334	W	TC =25°C, TJ =175°C	
TL	Solder Temperature	260	°C		
TJ, Tstg	Operating Junction and Storage Temperature	-55 to +175	°C		



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	V _{GS} =0V, I _D =100uA	
V _{GS(th)}	Gate Threshold Voltage	1.9	2.6	4.0	V	V _{GS} = V _{DS} , I _{DS} =11.5mA, TC =25°C	
			1.8			V _{GS} = V _{DS} , I _{DS} =11.5mA, TC =175°C	
I _{DSS}	Zero Gate Voltage Drain Current		1	100	μA	V _{DS} = 1200V, V _{GS} =0V	
I _{GSS}	Gate-Source Leakage Current		10	250	nA	V _{GS} =22V, V _{DS} = 0V	
R _{DS(on)}	Drain-Source on-state Resistance		30	42	mΩ	V _{GS} =18V, I _D =40A, TC =25°C	
			62	80		V _{GS} =18V, I _D =40A, TC =175°C	
C _{iss}	Input Capacitance		2680		pF	V _{GS} =0V, V _{DS} =1000 V, f=1MHz, V _{AC} =25 mV	
C _{oss}	Output Capacitance		113				
C _{rss}	Reverse Transfer Capacitance		17				
E _{ON}	Turn-On Switching Energy		1096		μJ	V _{DS} =800V, V _{GS} =-4/18V, I _D =40A, R _{G(ext)} = 2.5Ω, L= 100μH	
E _{OFF}	Turn-Off Energy		335				
t _{d(on)}	Turn-On Delay Time		26.4		ns	V _{DS} =800V, V _{GS} =-4/18 V, I _D = 40A, R _{G(ext)} =2. 5 Ω , R _L =20Ω	
t _r	Rise Time		17.6				
t _{d(off)}	Turn-Off Delay Time		50				
t _f	Fall Time		11				
R _{G(int)}	Internal Gate Resistance		3.3		Ω	f=1 MHz, V _{AC} =25mV	
Q _{gs}	Gate to Source Charge		31		nC	V _{DS} =800V, V _{GS} =-4/18V, I _D =40A	
Q _{gd}	Gate to Drain Charge		27.4				
Q _g	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	V _{GS} = -4V, I _{SD} = 20A, T _J = 25°C	
		3.9		V	V _{GS} = -4V, I _{SD} = 20 A, T _J = 175°C	
I _S	Continuous Diode Forward Current		68	A	T _C = 25°C	
trr	Reverse Recovery time	23		ns	I _{SD} = 40 A, V _R = 800V	
Q _{rr}	Reverse Recovery Charge	110		nC		
I _{rrm}	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

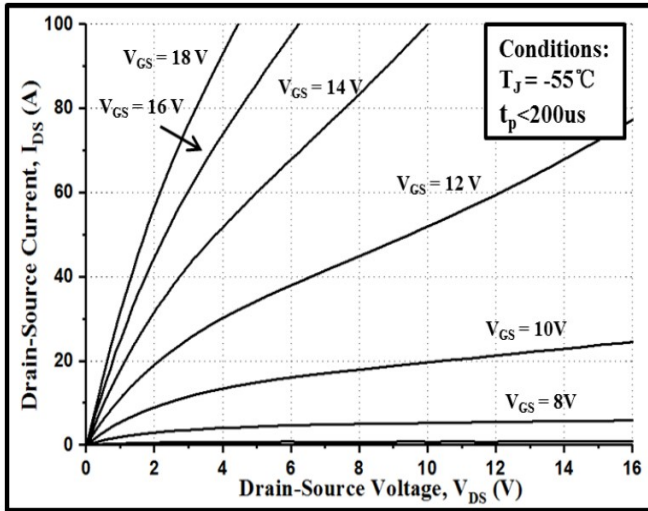


Figure 1. Output Characteristics $T_J = -55^\circ\text{C}$

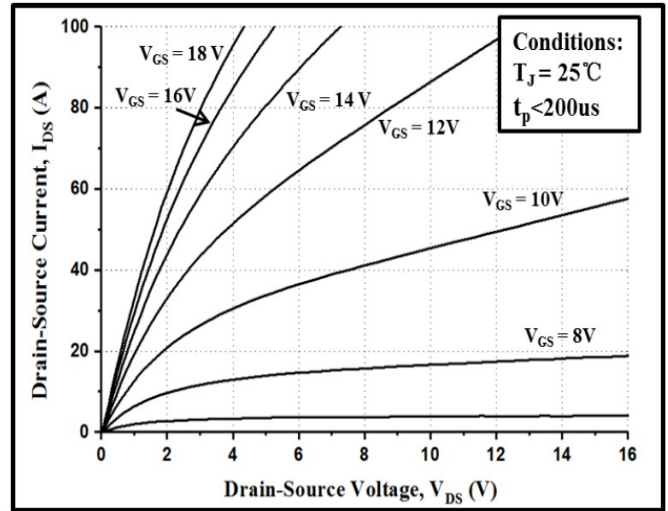


Figure 2. Output Characteristics $T_J = 25^\circ\text{C}$

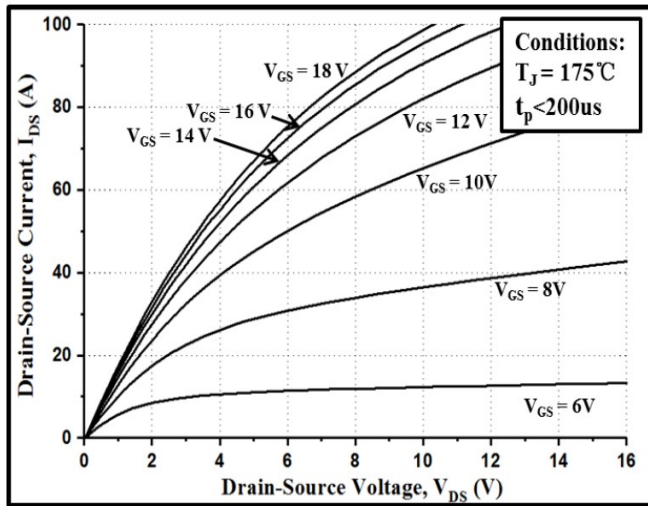


Figure 3. Output Characteristics $T_J = 175^\circ\text{C}$

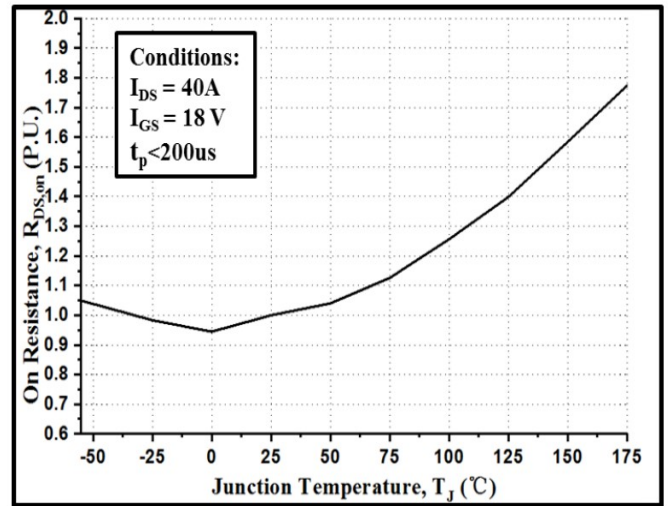


Figure 4. Normalized On-Resistance vs. Temperature

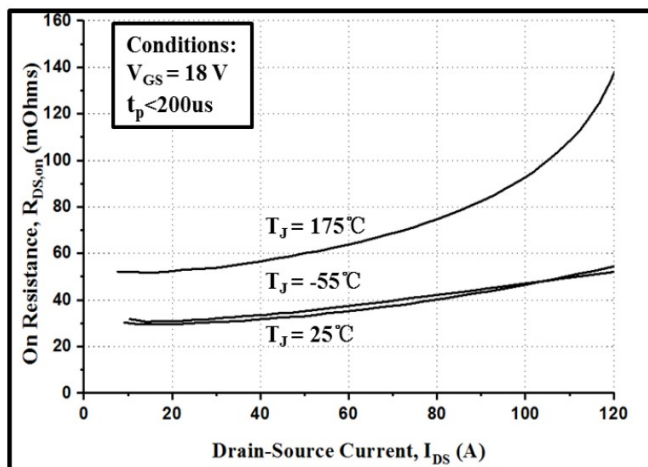


Figure 5. On-Resistance vs. Drain Current
For Various Temperatures

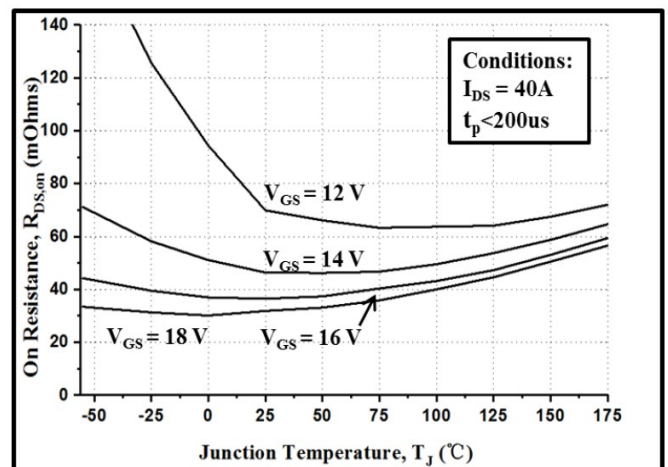


Figure 6. On-Resistance vs. Temperature
For Various Gate Voltage

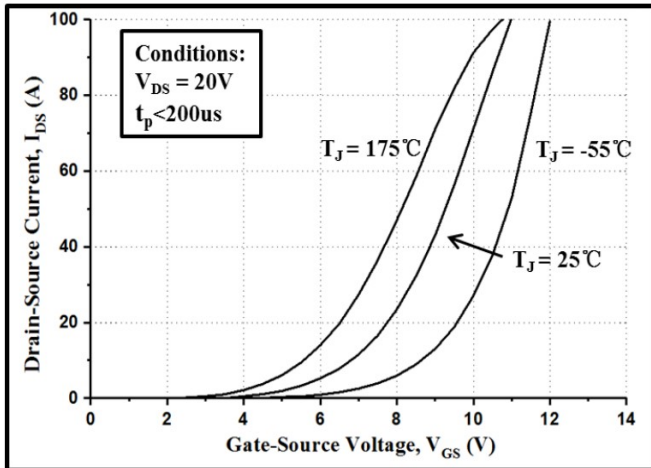


Figure 7. Transfer Characteristic for Various Junction Temperatures

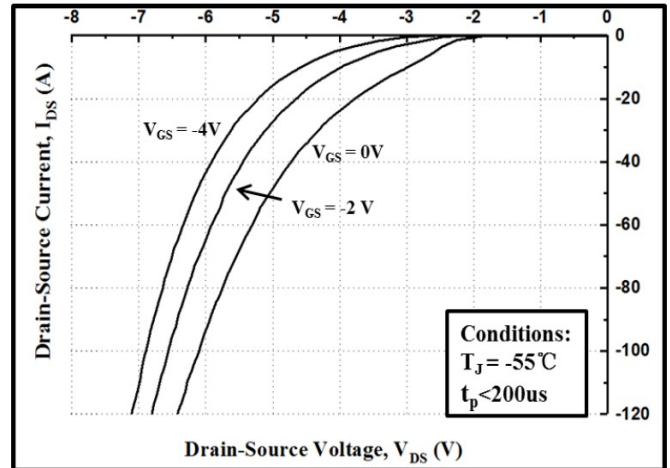


Figure 8. Body Diode Characteristic at -55°C

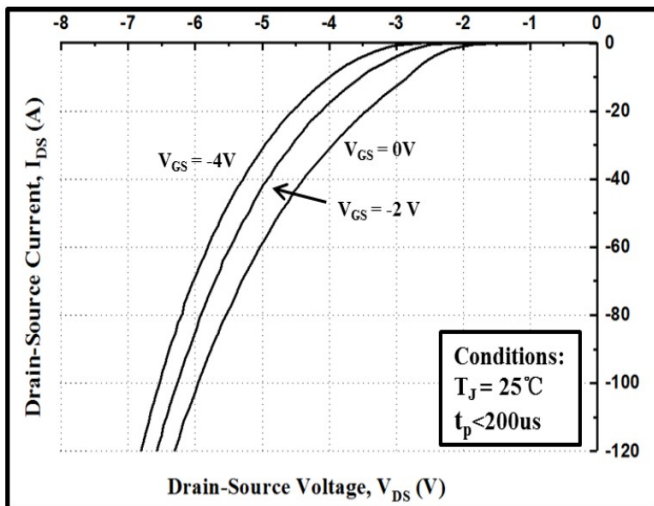


Figure 9. Body Diode Characteristic at 25°C

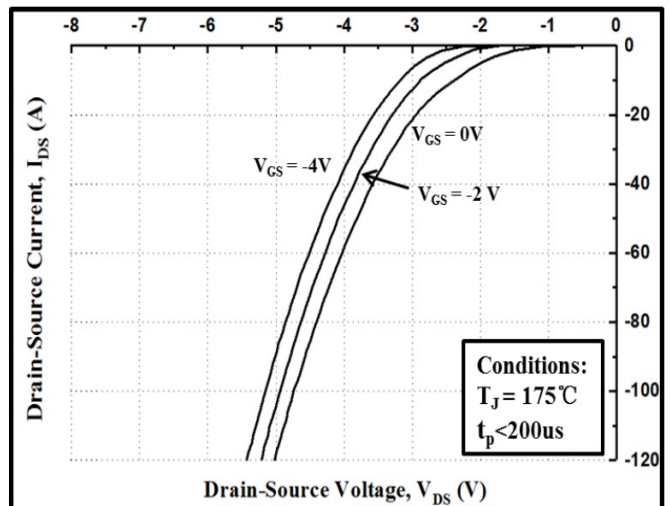


Figure 10. Body Diode Characteristic at 175°C

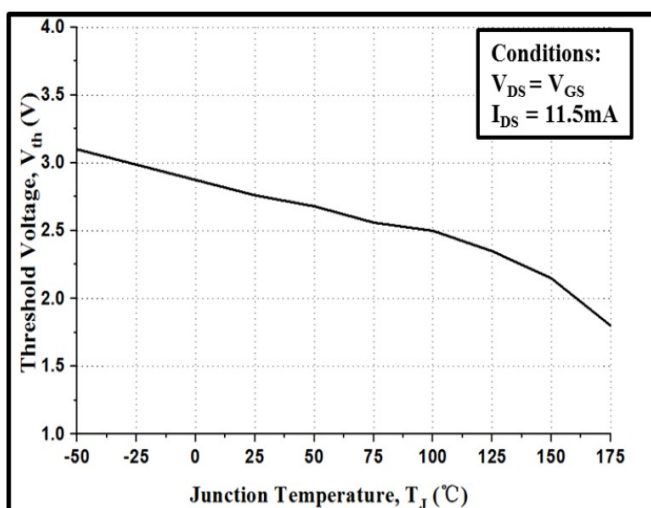


Figure 11. Threshold Voltage vs. Temperature

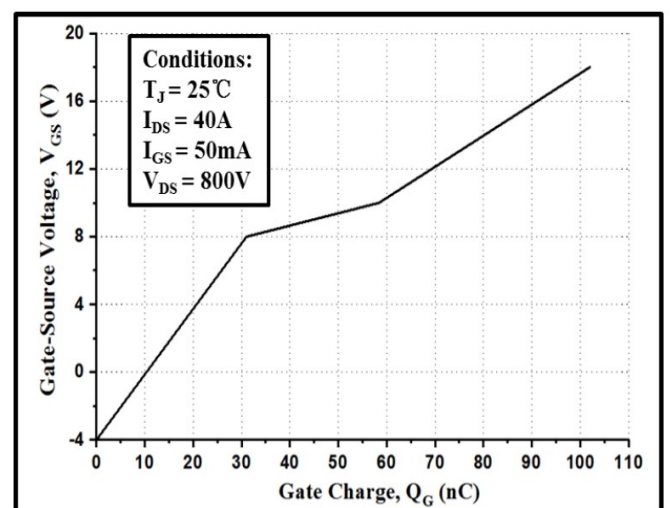


Figure 12. Gate Charge Characteristics

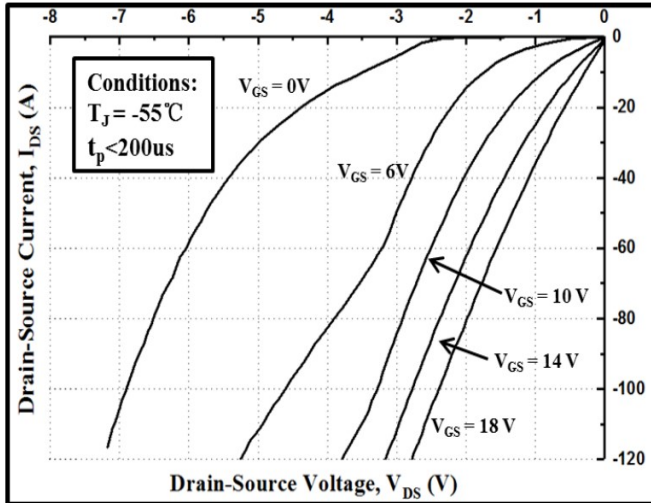


Figure 13. 3rd Quadrant Characteristic at -55°C

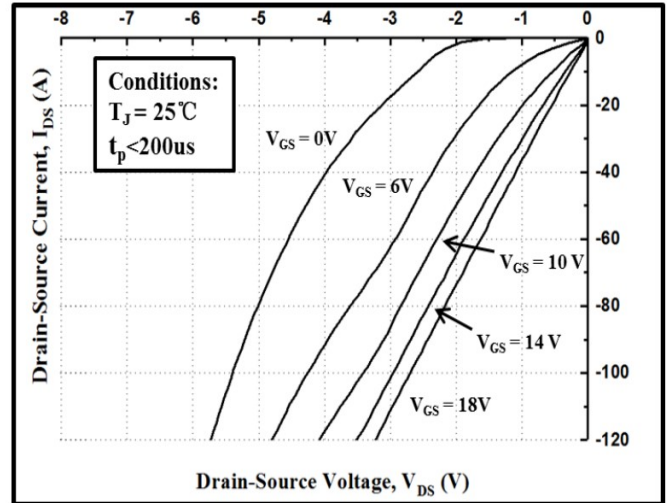


Figure 14. 3rd Quadrant Characteristic at 25°C

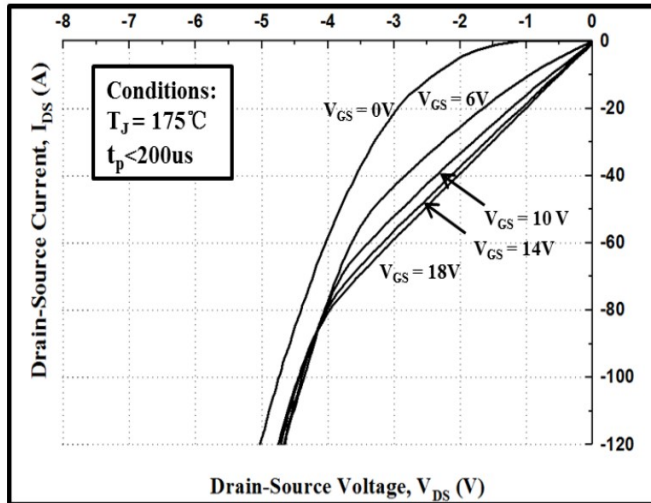


Figure 15. 3rd Quadrant Characteristic at 175 °C

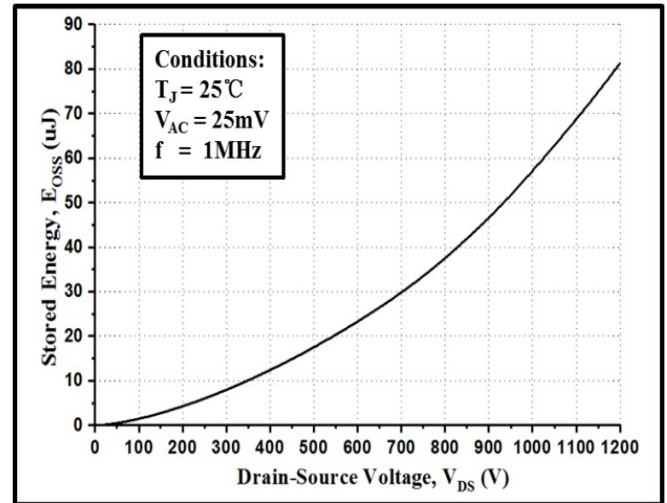


Figure16. Output Capacitor Stored Energy

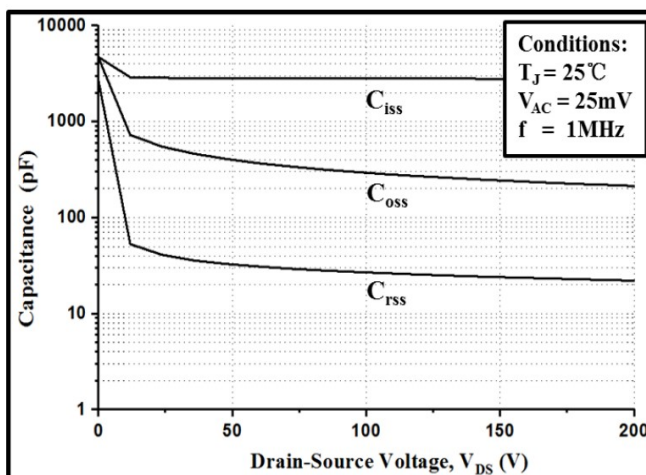


Figure 17. Capacitances vs. Drain-Source Voltage (0 - 200V)

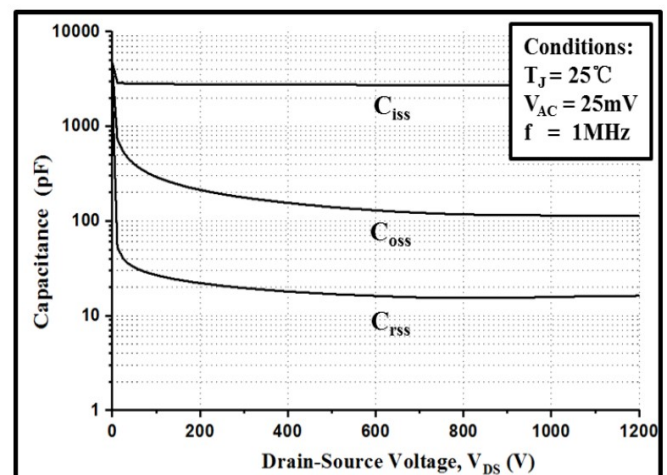


Figure 18. Capacitances vs. Drain-Source Voltage (0 - 1200V)

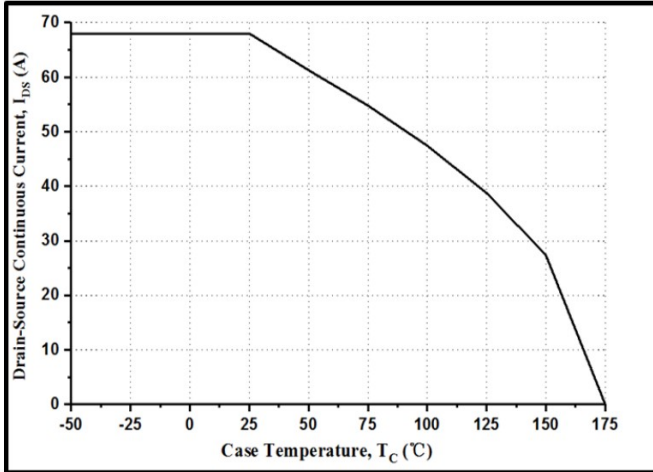


Figure 19. Continuous Drain Current Derating vs. Case Temperature

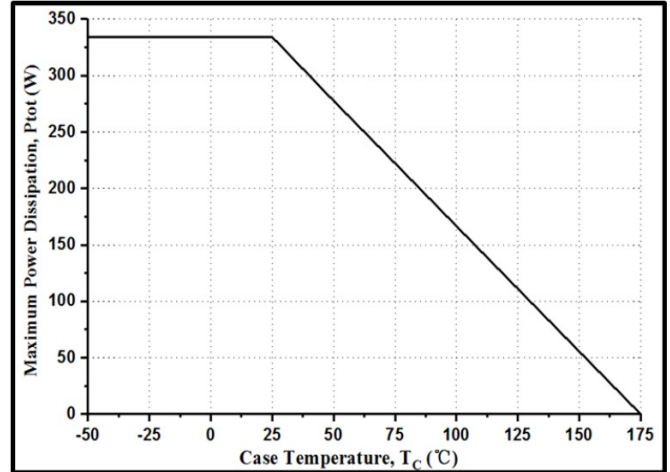


Figure 20. Maximum Power Dissipation Derating vs. Case Temperature

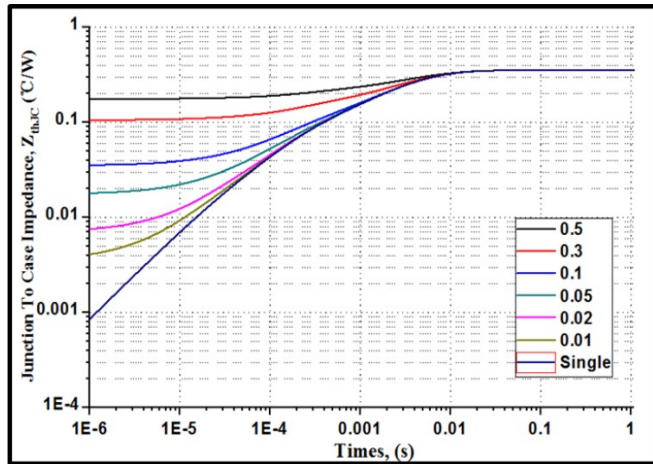


Figure 21. Transient Thermal Impedance (Junction - Case)

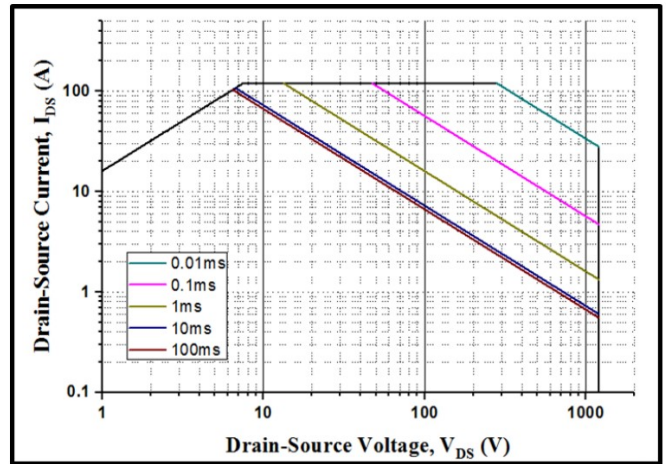
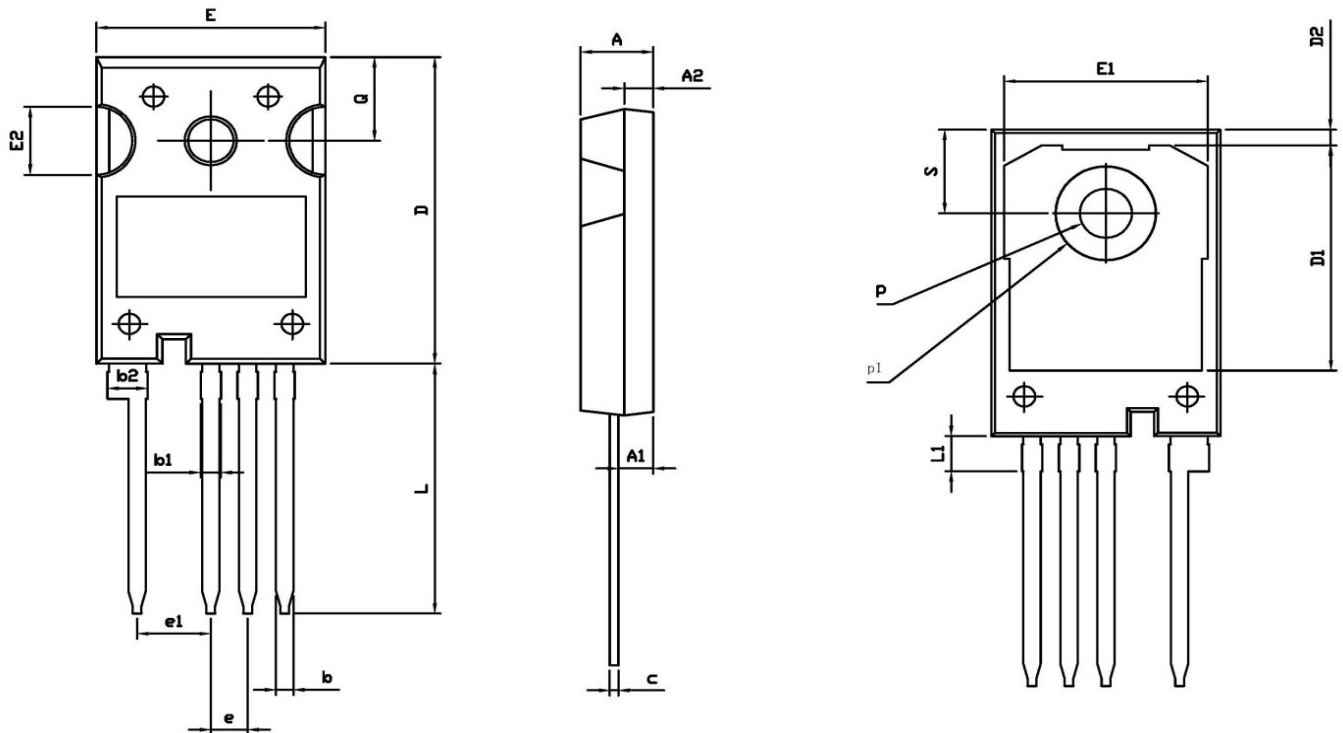
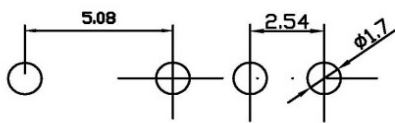


Figure 22. Safe Operating Area

Package outline drawing(TO-247-4 Unit: mm)



RECOMMENDED LAND PATTERN



UNIT: mm

	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.25	2.40	2.45
A2	1.85	2.00	2.15
b	1.05	1.20	1.35
b1	1.00	1.30	1.60
b2	2.35	2.65	2.95
c	0.50	0.60	0.70
D	22.34	22.54	22.74
D1	16.00	16.50	17.00
D2	0.97	1.17	1.37
e	2.34	2.54	2.74
e1	4.88	5.08	5.28
E	15.60	15.80	16.00
E1	13.50	14.00	14.50
E2	4.80	5.00	5.20
L	18.08	18.38	18.68
L1	2.38	2.58	2.78
p	3.50	3.60	3.70
p1	6.60	6.80	7.00
Q	6.00	6.15	6.30
S	6.00	6.15	6.30

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