

Features

- CRM G2 SiC MOSFET Technology
- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitances
- Avalanche Ruggedness
- Fast Reverse Recovery

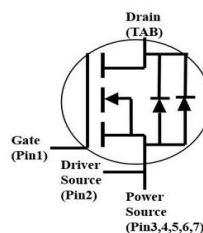
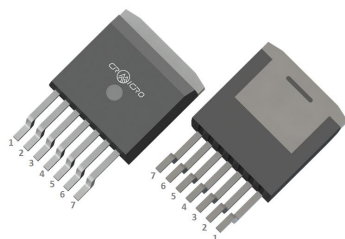
Applications

- Solar Inverters
- High Voltage DC/DC Converters
- On Board Charger(OBC)
- EV Charger

Product Summary

V _{DS}	1200V
R _{DS(on)_typ}	75mΩ
I _D	32A

100% Avalanche Tested



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Qty
CRXSPS75M120G2Z	XS75M120G2Z	TO-263-7	Reel	800pcs

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V _{DS}	1200	V
Continuous drain current V _{GS} =15V, T _C = 25°C V _{GS} =15V, T _C = 100°C	I _D	32 23	A
Pulsed drain current (T _C = 25°C, t _p limited by T _{jmax})	I _{D(pulse)}	80	A
Avalanche energy, single pulse (L=10mH, Rg=25Ω)	E _{AS}	360	mJ
Gate-Source voltage (dynamic)	V _{GSmax}	-10/+22	V
Gate-Source voltage (static)	V _{GSop}	-5/+18	V
Power dissipation (T _C =25°C, T _J =175°C)	P _D	136	W
Operating Junction and Storage Temperature	T _j , T _{stg}	-55...175	°C

a1: When using MOSFET Body Diode V_{GSmax} = -5V/+22V

a2: MOSFET can also safely operate at 0/+18 V

Thermal Resistance

Parameter	Symbol	Value	Unit
MOSFET Thermal resistance, junction – case. Max	R_{thJC}	1.1	°C/W
SBD Thermal resistance, junction – case. Max	R_{thJC}	1.4	
Thermal resistance, junction – ambient. Max	R_{thJA}	40	

Electrical Characteristic (at $T_j = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		

Static Characteristic

Drain-source breakdown voltage	$V_{(BR)DSS}$	1200	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate threshold voltage	$V_{GS(th)}$	1.8	-	3.6	V	$V_{DS}=V_{GS}, I_D=5mA$
Zero gate voltage drain current	I_{DSS}	-	3	100	μA	$V_{DS}=1200V, V_{GS}=0V$ $T_j=25^\circ\text{C}$
		-	20	-		$T_j=175^\circ\text{C}$
Gate-source leakage current	I_{GSS}	-	-	± 100	nA	$V_{GS}=-10/+22V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	75	90	mΩ	$V_{GS}=15V, I_D=20A,$ $T_j=25^\circ\text{C}$
		-	131	-		$T_j=175^\circ\text{C}$
Drain-source on-state resistance	$R_{DS(on)}$	-	65	82	mΩ	$V_{GS}=18V, I_D=20A,$ $T_j=25^\circ\text{C}$
		-	127	-		$T_j=175^\circ\text{C}$
Transconductance	g_{fs}	-	18	-	S	$V_{DS}=20V, I_{DS}=20A$

Dynamic Characteristic

Internal Gate resistance	$R_{G(int)}$	-	1.8	-	Ω	f=1MHz
Input Capacitance	C_{iss}	-	1406	-	pF	$V_{GS}=0V, V_{DS}=1000V,$ f=1MHz
Output Capacitance	C_{oss}	-	59	-		
Reverse Transfer Capacitance	C_{rss}	-	6.4	-		
Coss Stored Energy	E_{oss}	-	33	-	uJ	
Gate Total Charge	Q_g	-	69.5	-	nC	VGS=-5/18V VDS=800V ID=20A
Gate-Source charge	Q_{gs}	-	13	-		
Gate-Drain charge	Q_{gd}	-	19	-		
Turn-on delay time	$t_{d(on)}$	-	6.4	-	ns	VDD=800V,ID=20A VGS=-5V/15V, RG=2.5Ω, L=200uH
Rise time	t_r	-	10	-		
Turn-off delay time	$t_{d(off)}$	-	14.7	-		
Fall time	t_f	-	8.6	-		
Turn-On Switching Energy	$E_{(on)}$	-	44.8	-	uJ	
Turn Off Switching Energy	$E_{(off)}$	-	57.2	-		

Reverse Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Diode Forward Voltage	V_{SD}	-	1.9	-	V	$V_{GS}=0V, I_F=20A$
		-	3.5	-	V	$V_{GS}=0V, I_F=20A, T_J=175^{\circ}C$
Continuous Diode Forward Current	I_S	-	-	32	A	$V_{GS}=0V$
Body Diode Reverse Recovery Time	t_{rr}	-	22	-	ns	$di/dt=1000A/us$ $I_F=20A$ $V_{DD}=800V$ $T_J=25^{\circ}C$
Body Diode Reverse Recovery Charge	Q_{rr}	-	97.6	-	nC	
Body Diode Peak Reverse Recovery Current	I_{rrm}	-	7.1	-	A	

Typical Performance Characteristics

Fig 1. Output Characteristics ($T_j = -55^\circ\text{C}$)

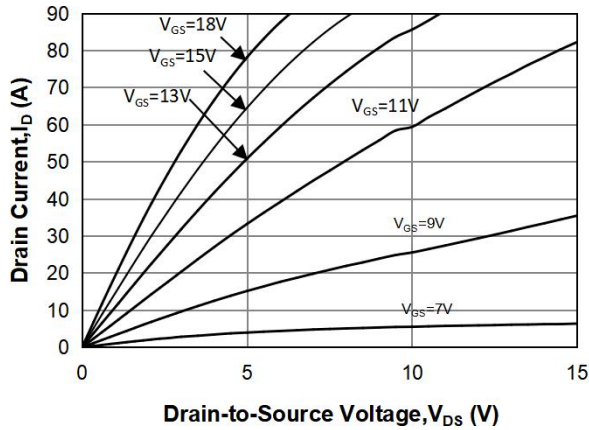


Fig 2. Output Characteristics ($T_j = 25^\circ\text{C}$)

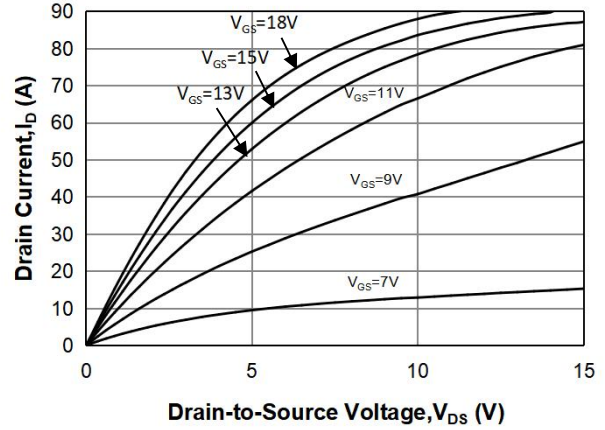


Fig 3. Output Characteristics ($T_j = 175^\circ\text{C}$)

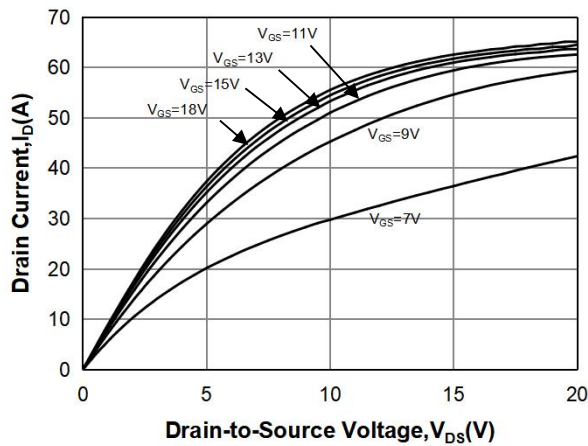


Fig 4: $R_{DS(on)}$ vs. Temperature

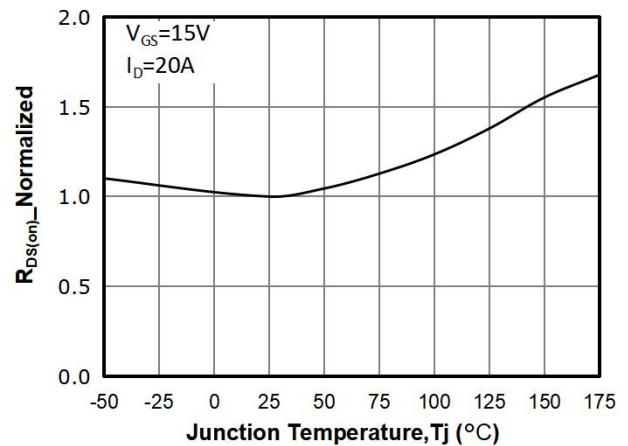


Fig 5: On-Resistance vs. Drain Current For Various Temperatures

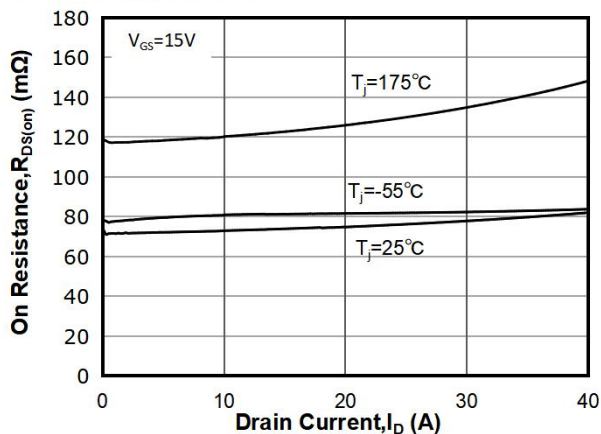


Fig 6: $R_{DS(on)}$ vs. Temperature For Various Gate Voltage

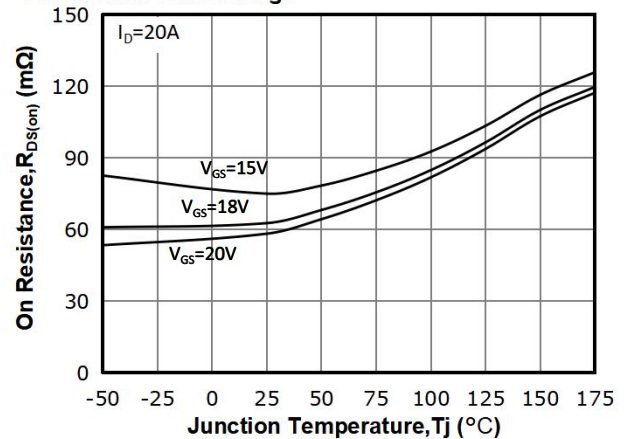


Fig 7: Transfer Characteristics

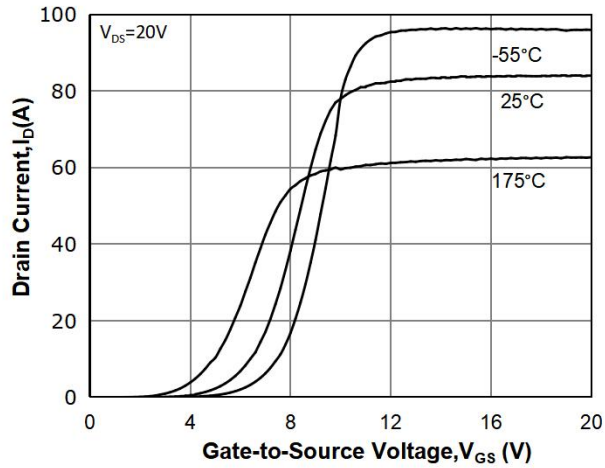


Fig 8: Body Diode Characteristic at 25°C

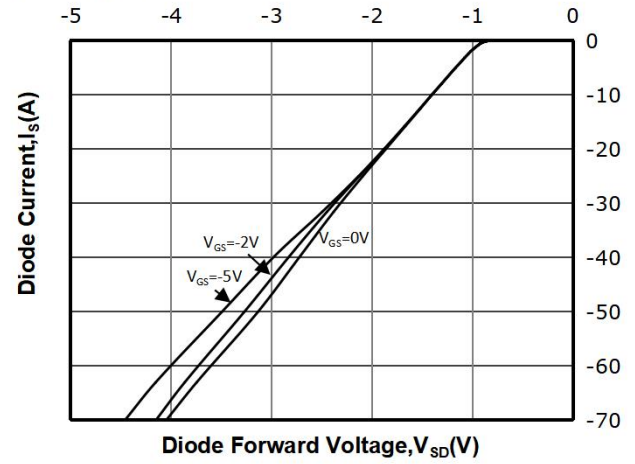


Fig 9: Body Diode Characteristic at 150°C

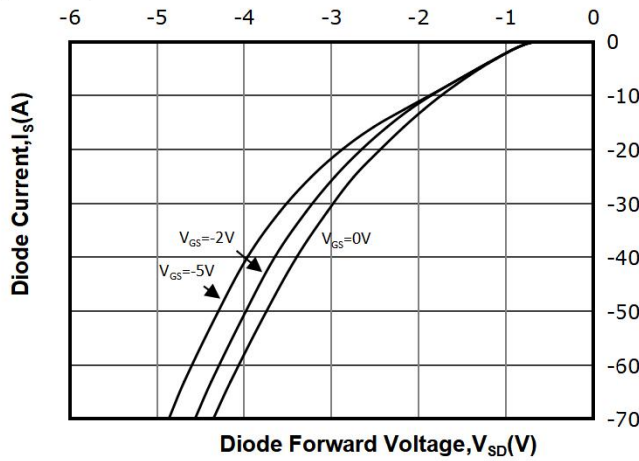


Fig 10: Body Diode Characteristic at 175°C

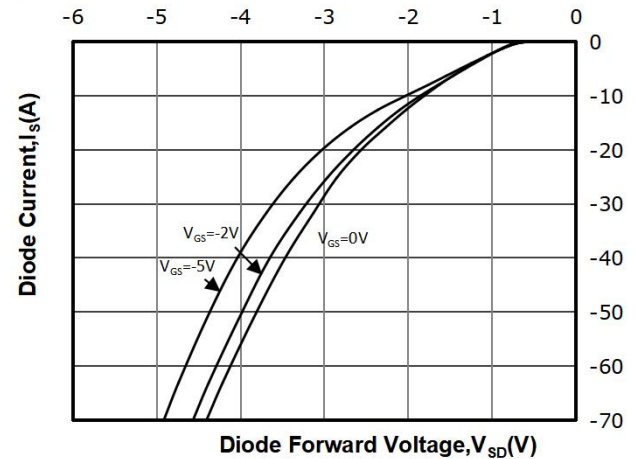


Fig 11: V_GS(th) Vs T_J Characteristics

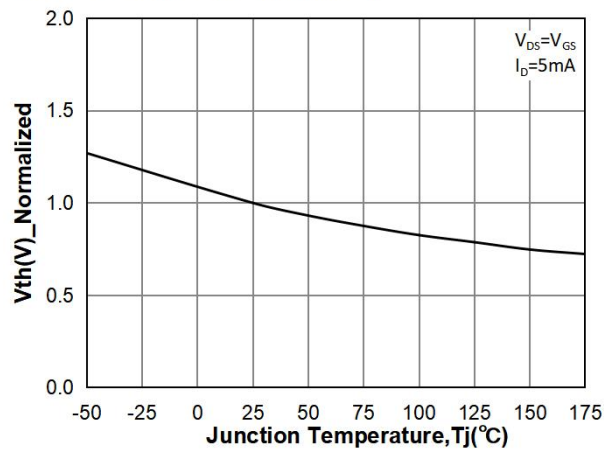


Fig 12: Gate Charge Characteristics

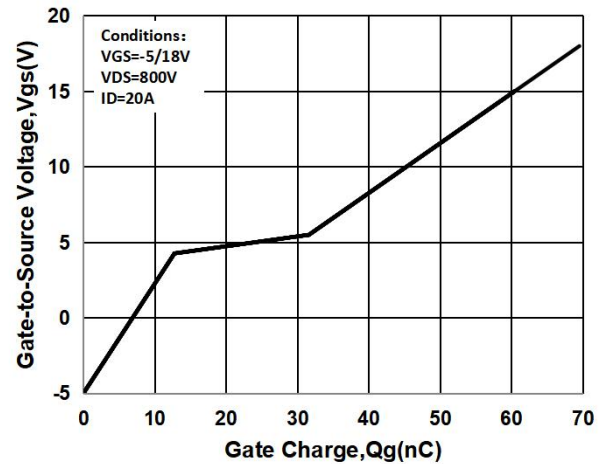


Fig 13: 3rd Quadrant Characteristic at 25°C

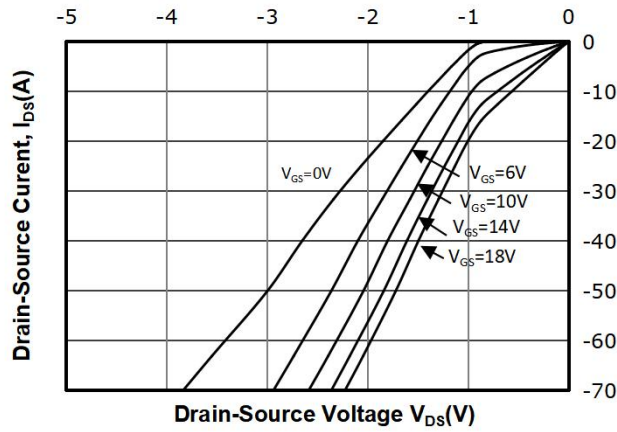


Fig 14: 3rd Quadrant Characteristic at 150°C

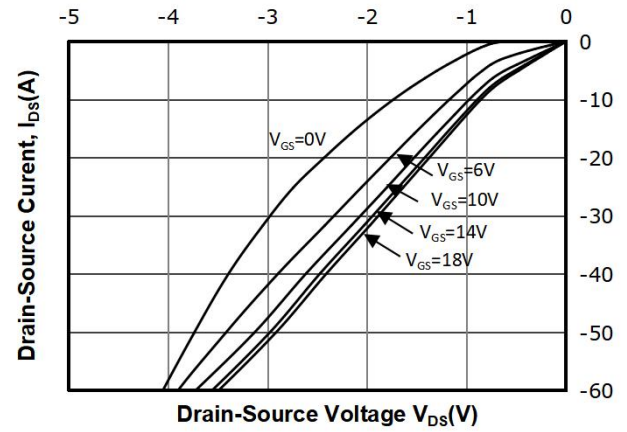


Fig 15: 3rd Quadrant Characteristic at 175°C

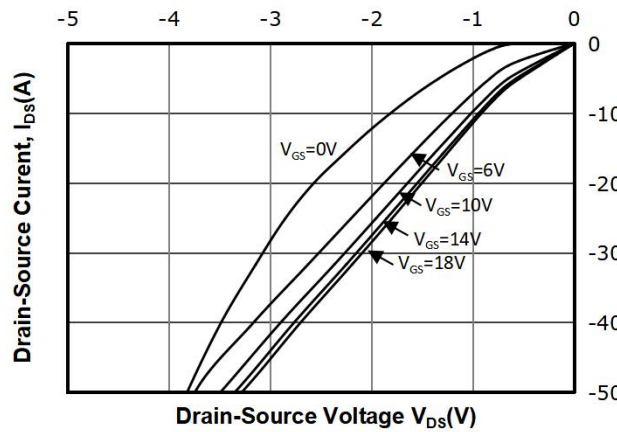


Fig 16: Capacitance Characteristics

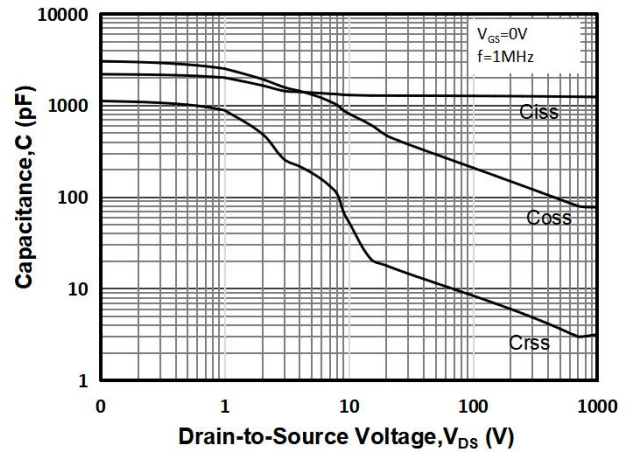


Fig 17: Output Capacitor Stored Energy

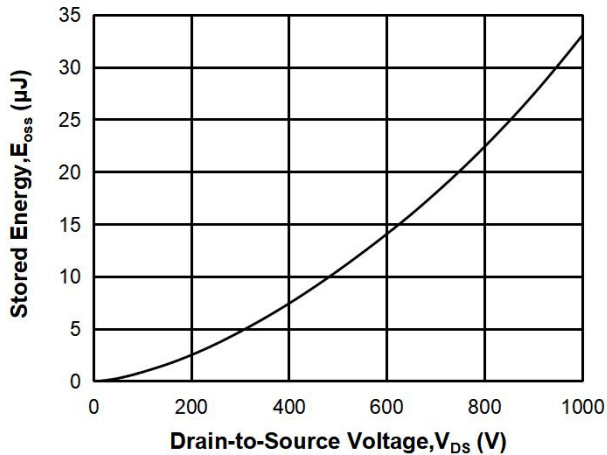


Fig 18: Forward Characteristic of Diode

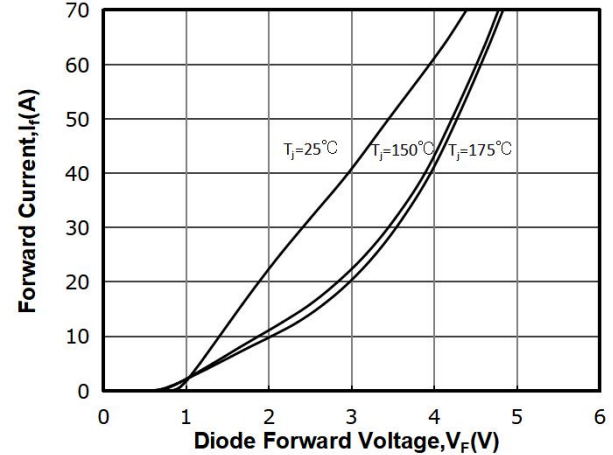


Fig 19: Continuous Drain Current vs. Case Temperature

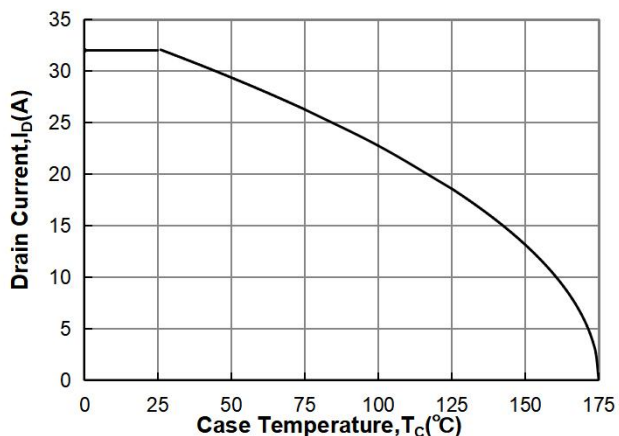


Fig 20: Maximum Power Dissipation vs. Case Temperature

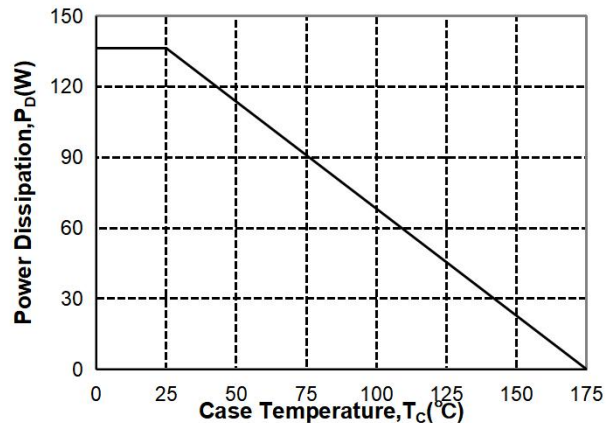


Fig.21: Peak forward current vs. Case temperature

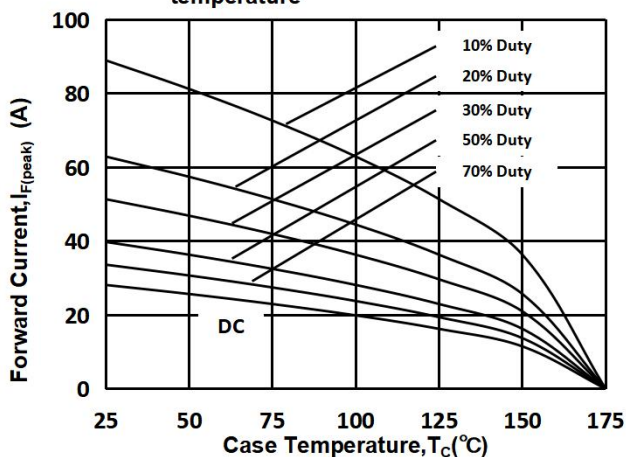


Fig 22: Safe Operating Area

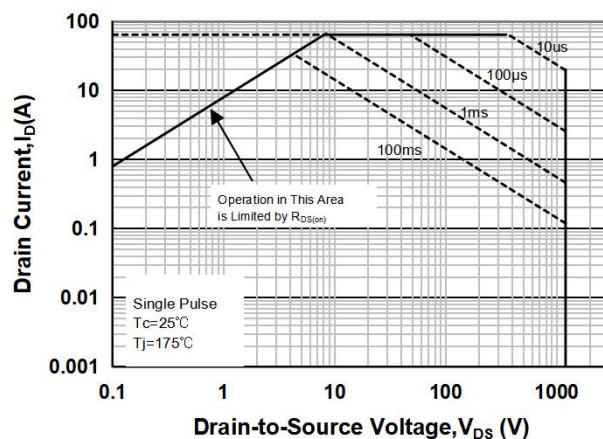


Fig 23: Max. Transient Thermal Impedance

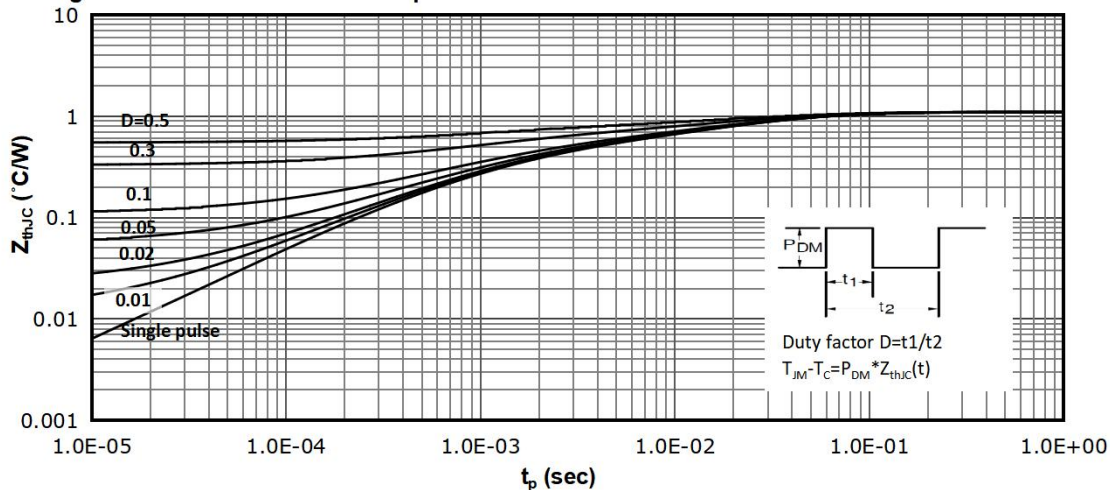


Fig 18: $R_g(\Omega)$ vs. Switching Times(us)

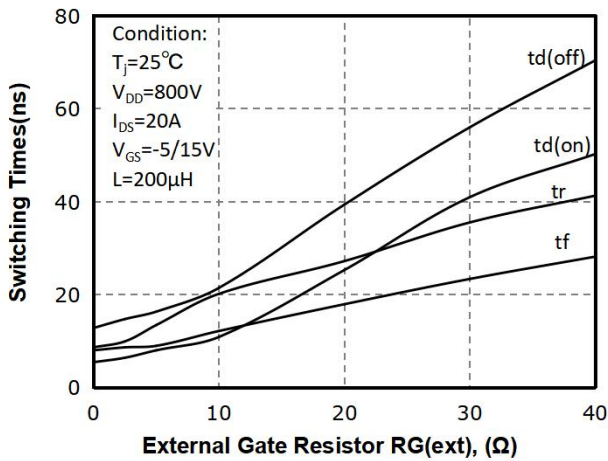


Fig 19: $R_g(\Omega)$ vs. Switching Loss(uJ)

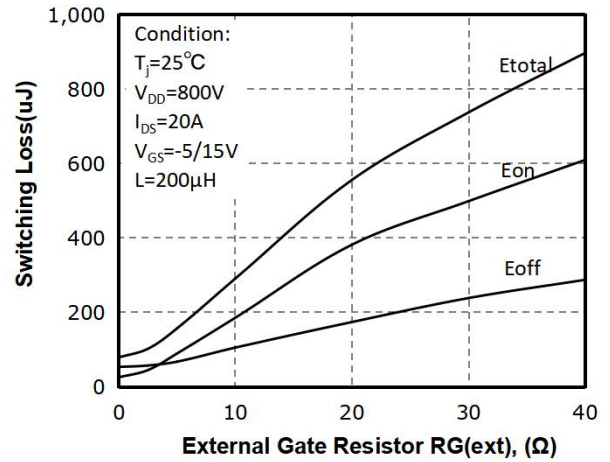


Fig 20: Temperature($^\circ\text{C}$) vs. Switching Loss(uJ)

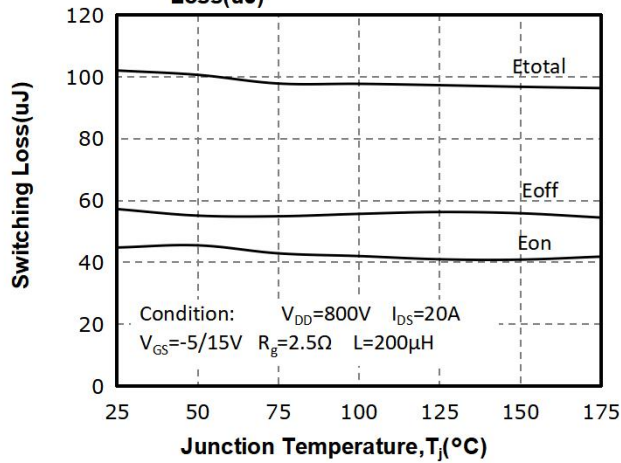
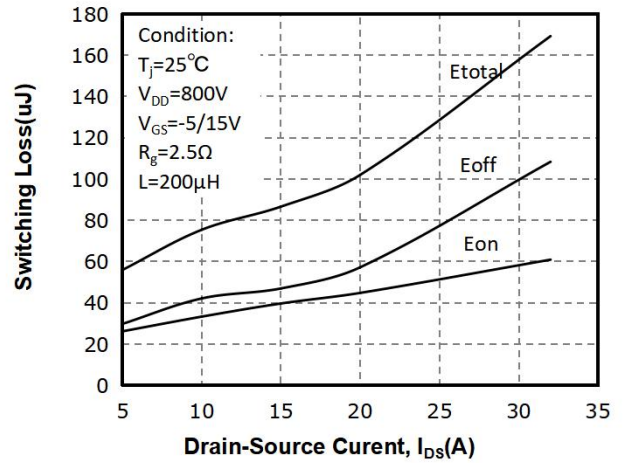
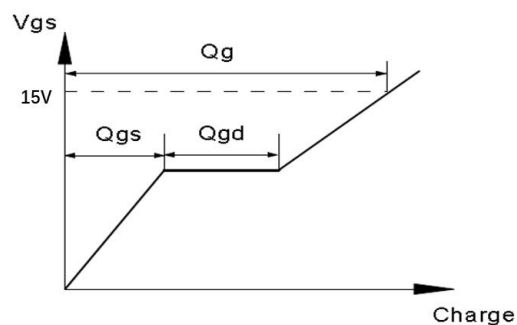
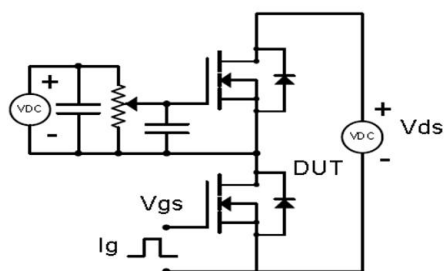


Fig 21: $I_{DS}(\text{A})$ vs. Switching Loss(uJ)

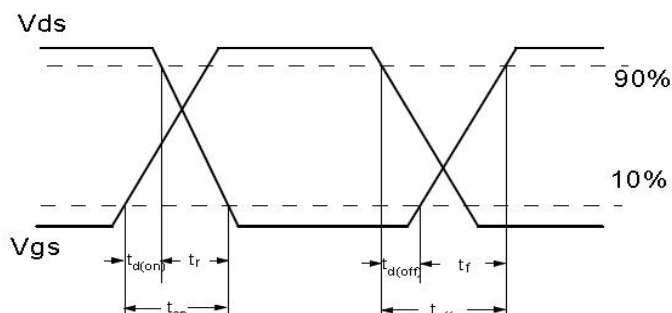
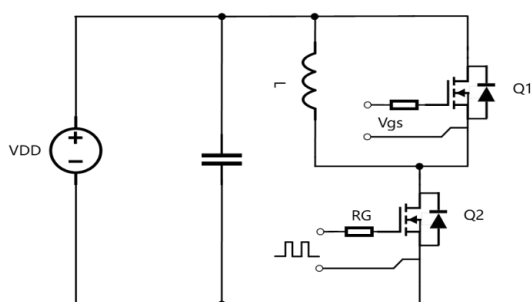


Test Circuit & Waveform

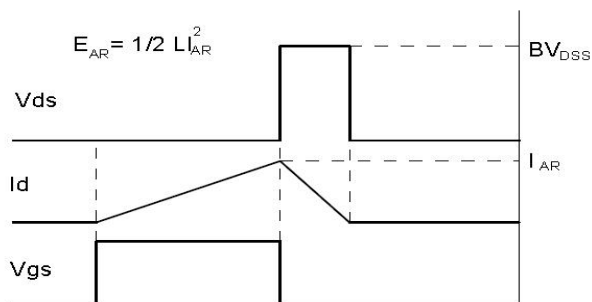
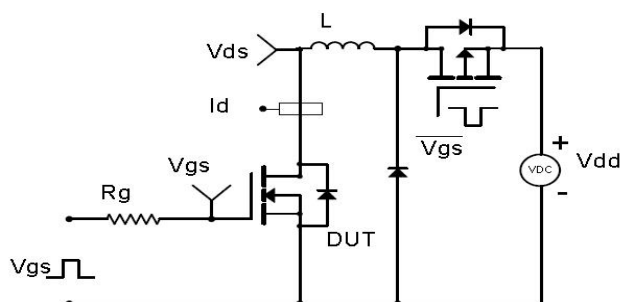
Gate Charge Test Circuit & Waveform



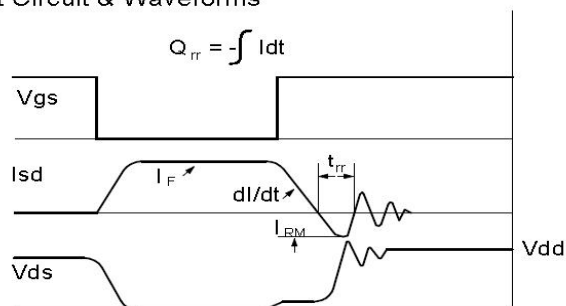
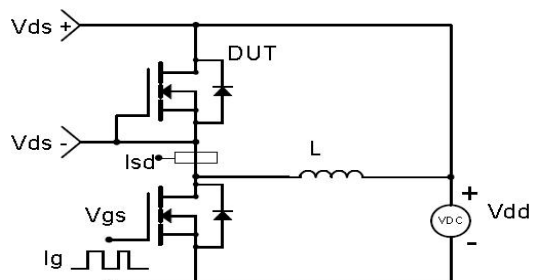
Resistive Switching Test Circuit & Waveforms



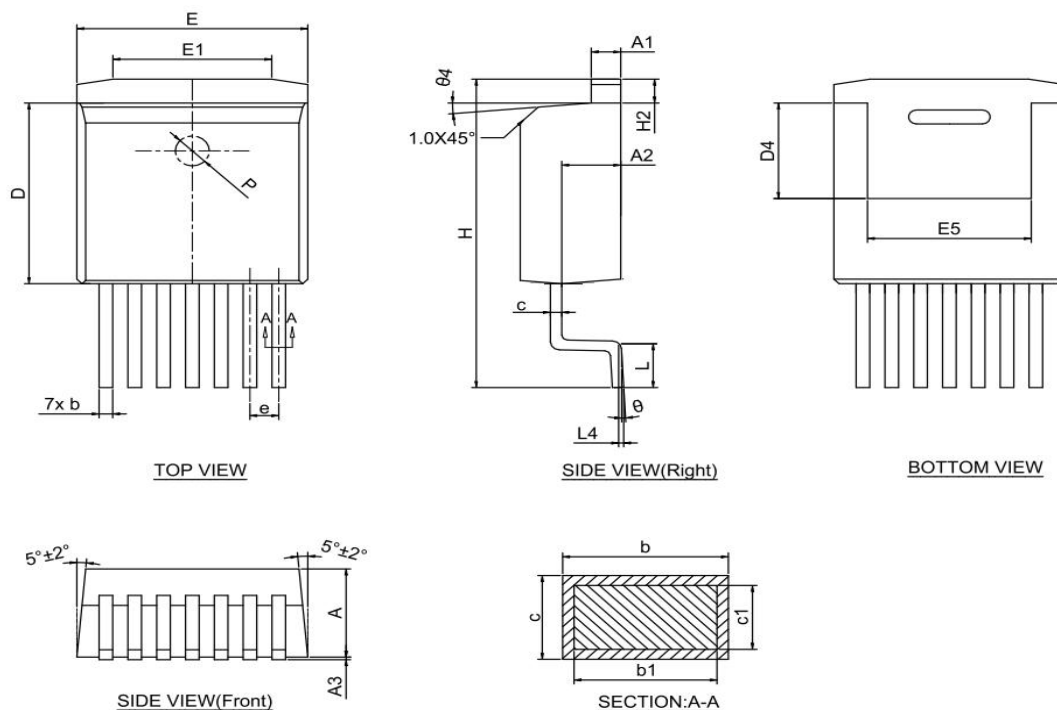
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline: TO-263-7



Items	Values(mm)	
	MIN	MAX
A	4.2	4.66
A1	1.15	1.45
A2	2.35	2.85
A3	0	0.3
b	0.5	0.78
b1	0.45	0.75
c	0.49	0.64
c1	0.4	0.6
D	8.83	9.33
D4	4.6	5
e	1.27 BSC.	
E	9.08	10.38
E1	6.4	7.6
E5	6.72	7.72
H	14.9	16.1
H2	0.9	1.45
L	1.8	2.6
L4	0.25 BCS.	
P	1.4	1.6
θ	0°	7°



CRXSPS75M120G2Z

SiC MOSFET 1200V, 75m Ω , 32A

Revision History

Revision	Date	Major changes
1.0	2025/3/21	Release of formal version
2.0	2025/8/30	Updating Switching Data

Disclaimer

Unless otherwise specified in the datasheet, the product is designed and qualified as a standard commercial product and is not intended for use in applications that require extraordinary levels of quality and reliability, such as automotive, aviation/aerospace and life-support devices or systems.

Any and all semiconductor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customer are solely responsible for providing adequate safe measures when design their systems.

CRM reserves the right to improve product design, function and reliability without notice.