MOSFET - SiC Power, Single N-Channel

1200 V, 65 mΩ, 49 A

KXMT120R65T8

Features

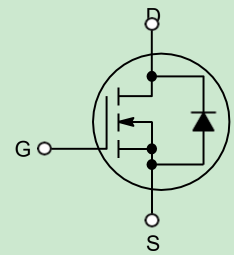
- Typ. $R_{DS(on)}$ = 65 mΩ
- Ultra Low Gate Charge ($Q_{G(tot)}$ = 46 nC)
- Capacitance (C_{oss} = 83 pF)
- 100% UIL Tested

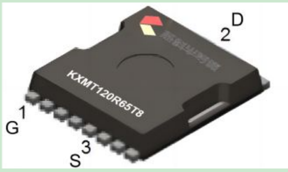
Typical Applications

- UPS
- DC/DC Converter
- Boost Inverter

$V_{(BR)DSS}$	$R_{DS(on)}$ MAX	I_D MAX
1200 V	65mΩ	49 A

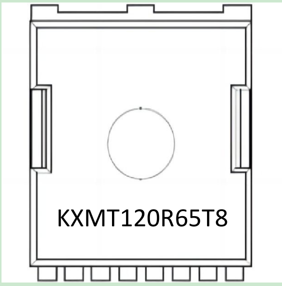
N–CHANNEL MOSFET





TOLL
CASE 340CX

MARKING DIAGRAM



MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

Parameter			Symbol	Value	Unit
Drain–to–Source Voltage			V_{DSS}	1200	V
Gate–to–Source Voltage			V_{GS}	-7/23	V
Recommended turn on Gate–to–Source Voltage		T_C < 175°C	$V_{GS, on}$	15-18	V
Recommended turn off Gate–to–Source Voltage		T_C < 175°C	$V_{GS, off}$	0	V
Continuous Drain Current $R_{θJC}$	Steady State	T_C = 25°C	I_D	49	A
		T_C = 100°C		35	A
Power Dissipation $R_{θJC}$	Steady State	T_C = 25°C	P_D	251	W
		T_C = 150°C		42	
Pulsed Drain Current (Note 2)	T_A = 25°C		I_{DM}	109	A
Operating Junction and Storage Temperature Range			T_J, T_{stg}	–55 to +175	°C
Source Current (Body Diode)			I_S	49	A

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL RESISTANCE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Junction–to–Case (Note 1)	$R_{θJC}$	0.6	°C/W
Junction–to–Ambient (Note 1)	$R_{θJA}$	33.62	°C/W

1. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
2. Repetitive rating, limited by max junction temperature.

Publication Order Number:
KXMT120R65T8

Static Electrical Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain–to–Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} =0 V, I_D = 100 uA		1200	1480	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0 V, V_{DS} = 1200 V, T_J = 25 °C		0.5	100	μA
		V_{GS} = 0 V, V_{DS} = 1200 V, T_J = 175 °C		3	100	
Gate–Source Leakage Current	I_{GSS}	V_{GS} = -10V, V_{DS} = 0V		-0.3	-100	nA
		V_{GS} = 25V, V_{DS} = 0V		4	100	
Transconductance	g_{fs}	V_{DS} = 20V, I_D = 15 A, T_J = 25 °C		7.89		S
		V_{DS} = 20 V, I_D = 15 A, T_J = 175 °C		7.75		
Drain–Source On Resistance	$R_{DS(on)}$	V_{GS} = 20V, I_D = 15 A, T_J = 25 °C		65		mΩ
		V_{GS} = 20 V, I_D = 15 A, T_J = 175 °C		103		
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS} = V_{DS} = 20 V, I_D = 5 mA, T_J = 25 °C		2.9		V
		V_{GS} = V_{DS} = 20 V, I_D = 5 mA, T_J = 175 °C		2		

Dynamic Electrical Characteristics

Parameter	Symbol	Test Conditions	Typ	Unit
Input Capacitance	C_{ISS}	V_{GS} = 0 V, V_{DS} = 1000 V, f = 1 MHz, V_{AC} = 25 mV	1083	pF
Output Capacitance	C_{OSS}		83	
Reverse Transfer Capacitance	C_{RSS}		3	
C_{OSS} Stored Energy	E_{OSS}		83	μJ
Turn-On Switching Loss	E_{ON}	V_{GS} = -4/20 V, V_{DS} = 800 V, I_D = 20A, R_G = 2 Ω, Inductive Load, T_J = 25 °C	376	μJ
		T_J = 175 °C	380	
Turn-Off Switching Loss	E_{OFF}	V_{GS} = -4/20 V, V_{DS} = 800 V, I_D = 20A, R_G = 2 Ω, Inductive Load, T_J = 25 °C	408	
		T_J = 175 °C	441	
Total Gate Charge	$Q_{G(tot)}$	V_{GS} = -4/20 V, V_{DS} = 800 V, I_D = 15 A	46	nC
Gate–Source Charge	Q_{GS}		15	
Gate–Drain Charge	Q_{GD}		15	
Gate Resistance	R_G	f = 1 MHz, V_{AC} = 25 mV	3.4	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{GS} = -4/20 V, V_{DS} = 800 V, I_D = 15A, R_G = 2 Ω, T_J = 175 °C Inductive Load	12	ns
Rise Time	t_r		8	
Turn-Off Delay Time	$t_{d(off)}$		18	
Fall Time	t_f		46	

Reverse Diode Characteristic

Parameter	Symbol	Test Conditions	Typ	Unit
Continuous Drain–to–Source Diode Forward Current	I_{SD}	V_{GS} = 0 V, T_J = 25 °C	49	A
Forward Diode Voltage	V_{SD}	V_{GS} = 0 V, I_{SD} = 15 A, T_J = -55 °C	5.1	V
		V_{GS} = 0 V, I_{SD} = 15 A, T_J = 25 °C	4.2	
		V_{GS} = 0 V, I_{SD} = 15 A, T_J = 175 °C	4.2	
Pulsed Drain–to–Source Diode For- ward Current (Note 2)	I_{SDM}	T_J = 25 °C	508 512	A
Reverse Recovery Time	t_{RR}	V_{GS} =-4V, I_{SD} = 20A, V_{DS} = 800 V, dI_S/dt = 1000 A/μs, T_J = 25 °C Q_{fr} includes also Q_C	15	ns
Reverse Recovery Charge	Q_{RR}		77	nC
Peak Reverse Recovery Current	I_{RRM}		9.5	A
Reverse Recovery Energy	E_{RR}		58	μJ

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

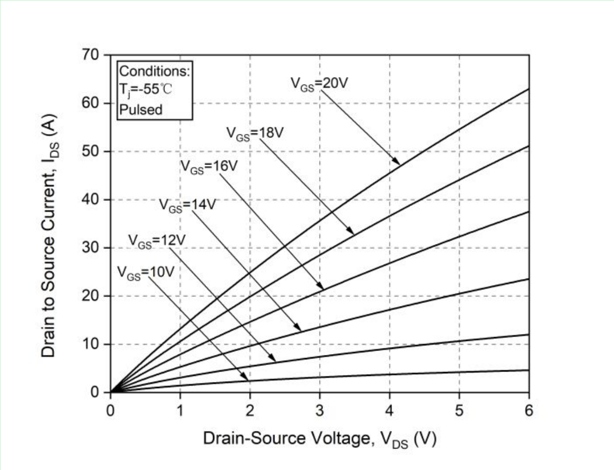


Figure 1. Output characteristics, TJ= -55ºC

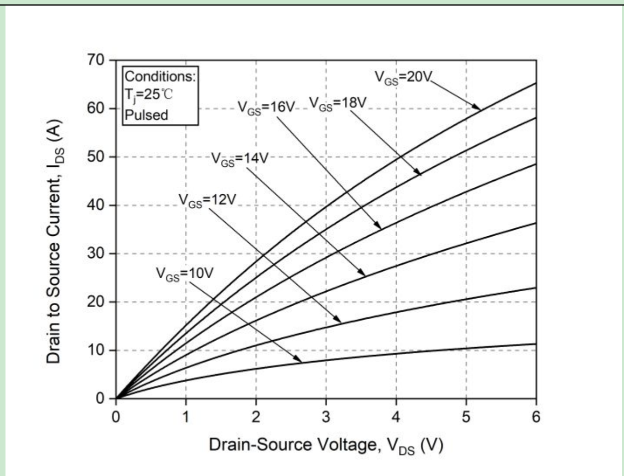


Figure 2. Output characteristics, TJ= 25ºC

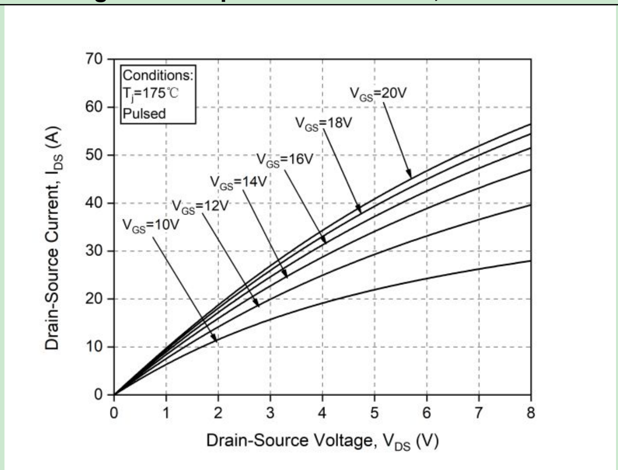


Figure 3. Output characteristics, TJ= 175ºC

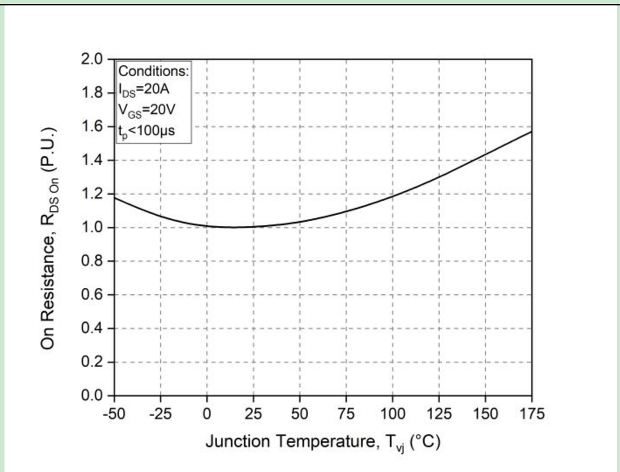


Figure 4. Normalized on-resistance vs. temperature

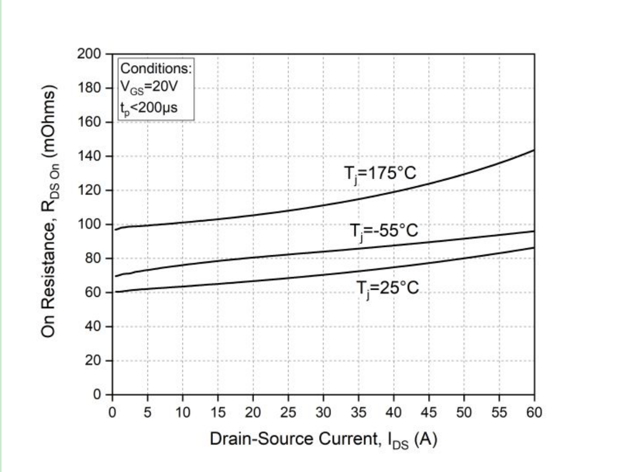


Figure 5. On-resistance vs. drain current

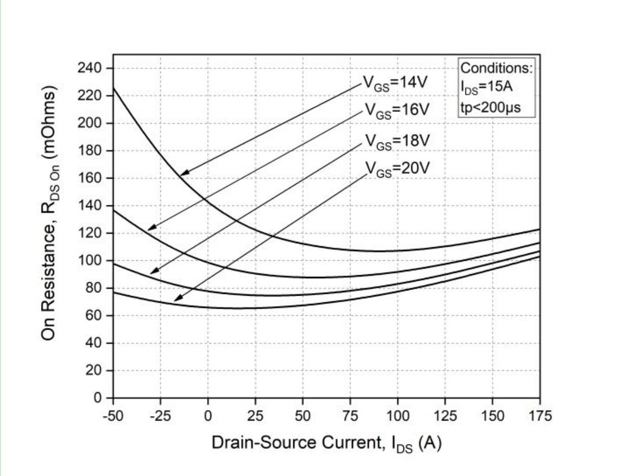


Figure 6. On-resistance vs. temperature for various gate voltage

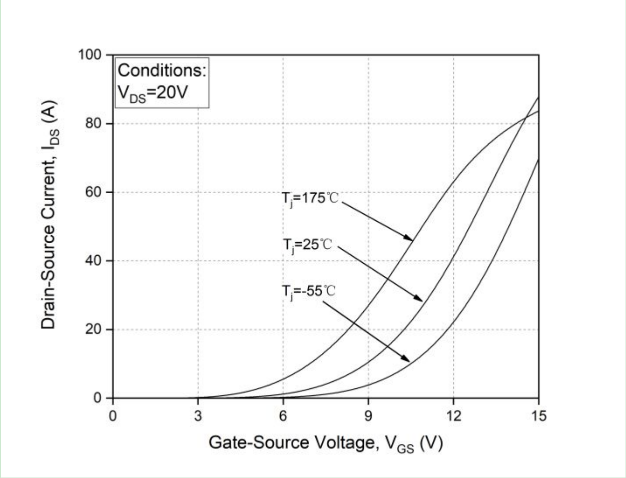


Figure 7. Transfer characteristic for various junction temperatures

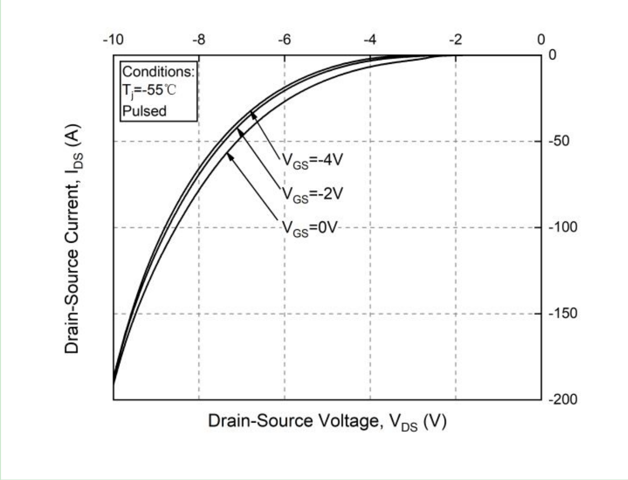


Figure 8. Body diode characteristic at T_J= -55ºC

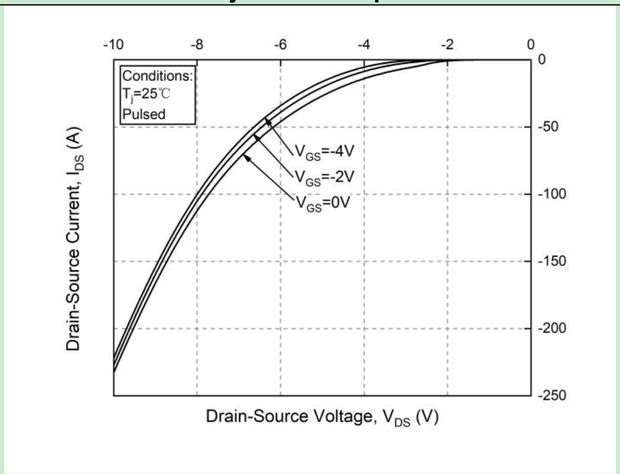


Figure 9. Body diode characteristic at T_J= 25ºC

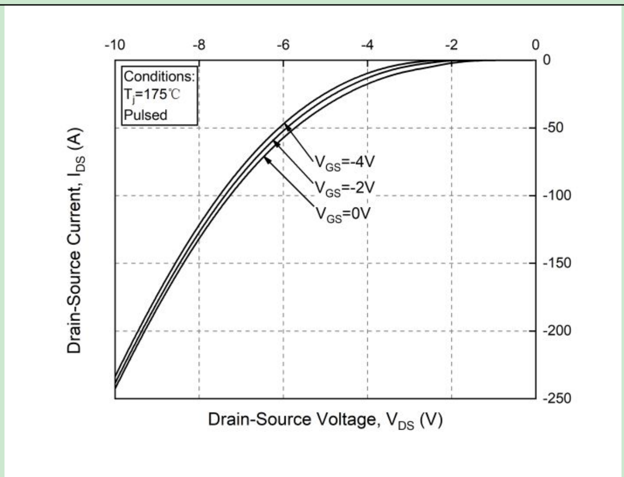


Figure 10. Body diode characteristic at T_J= 175ºC

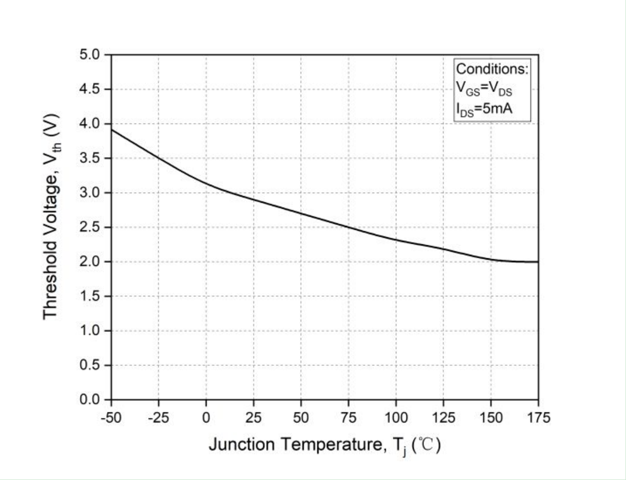


Figure 11. Threshold voltage vs. temperature

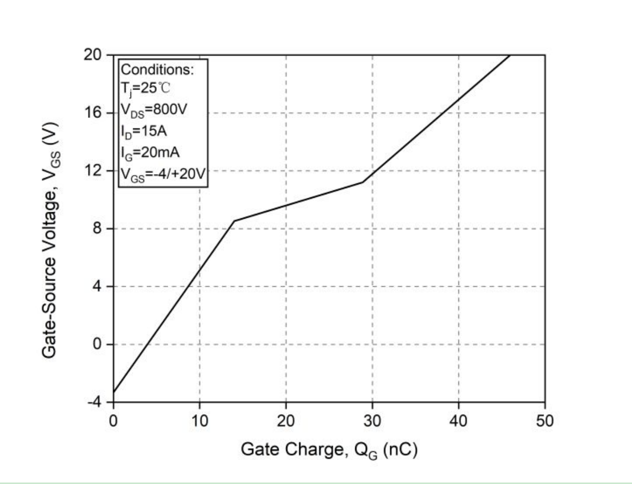


Figure 12. Gate charge characteristic

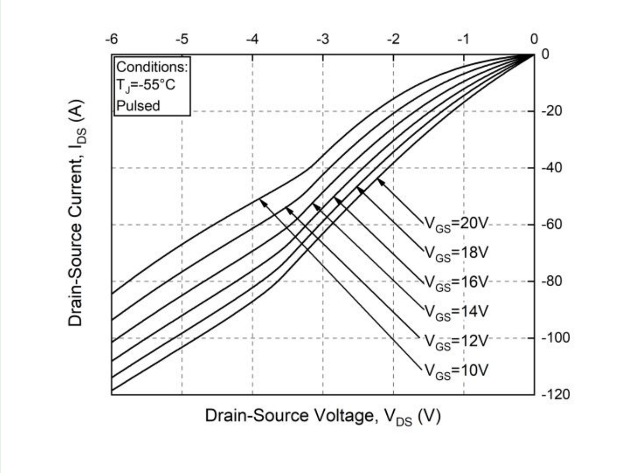


Figure 13. 3rd quadrant characteristic at T_J= -55ºC

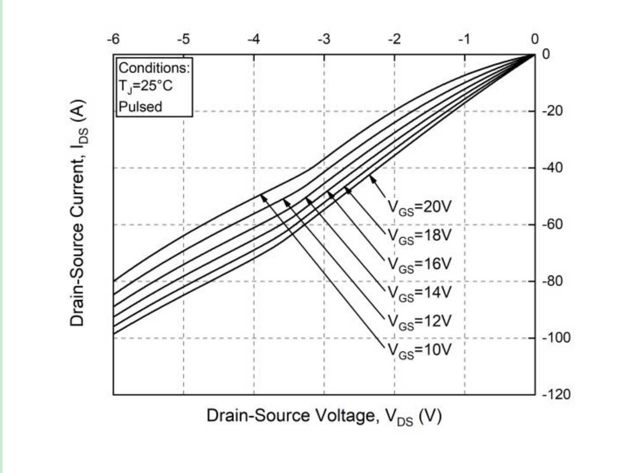


Figure 14. 3rd quadrant characteristic at T_J= 25ºC

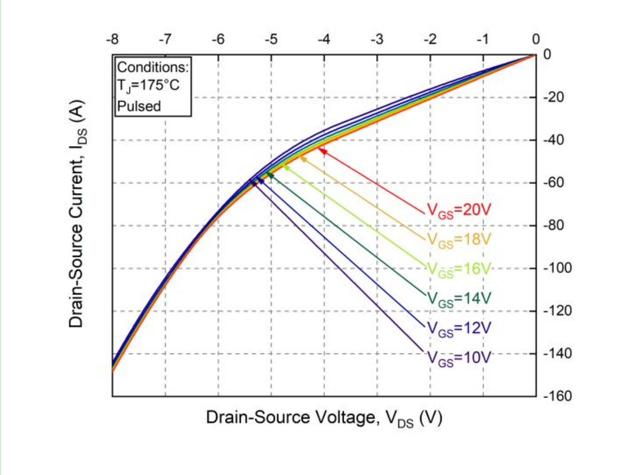


Figure 15. 3rd quadrant characteristic at T_J= 175ºC

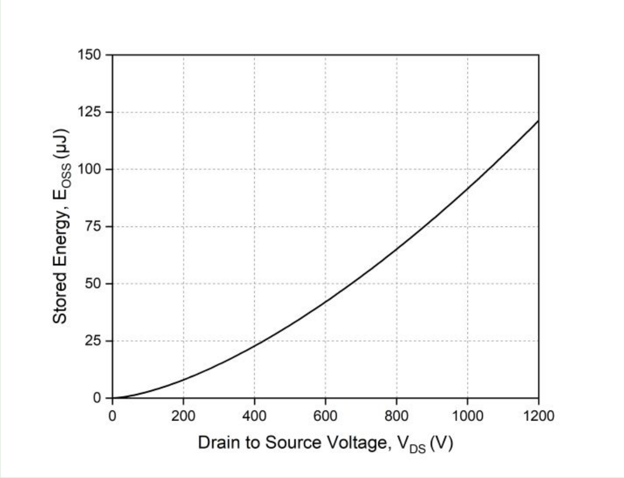


Figure 16. Output capacitor stored energy

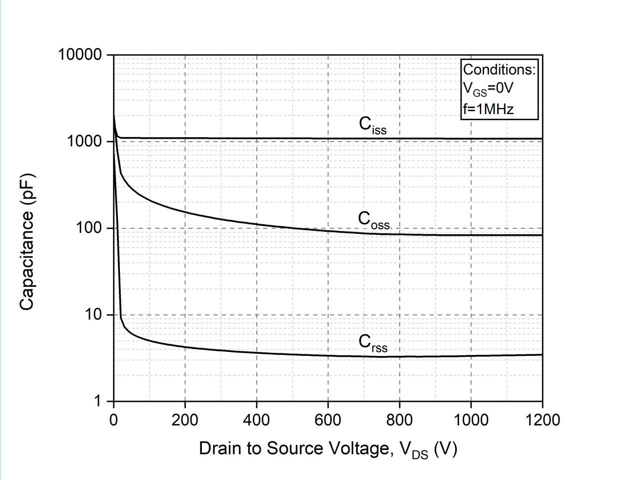


Figure 17. Capacitances vs. drain-source voltage

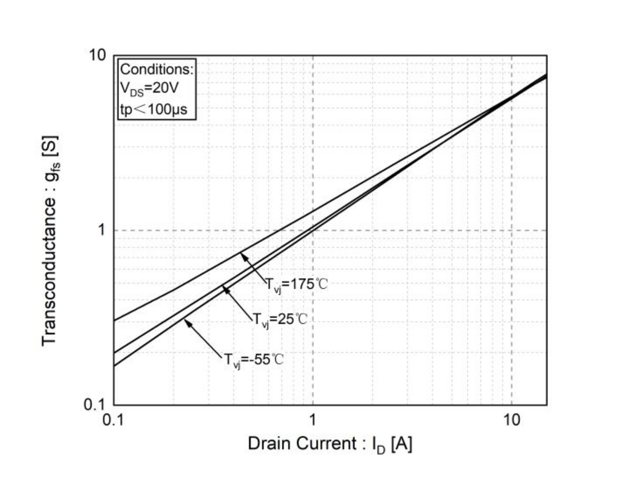


Figure 18. Transconductance vs drain current

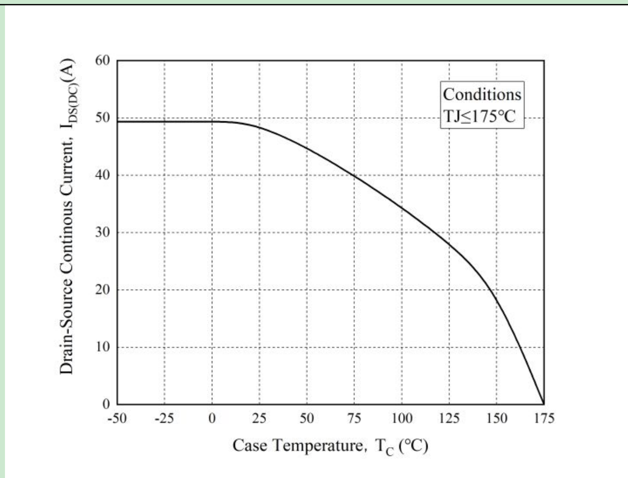


Figure 19. Continuous drain current derating vs. case temperature

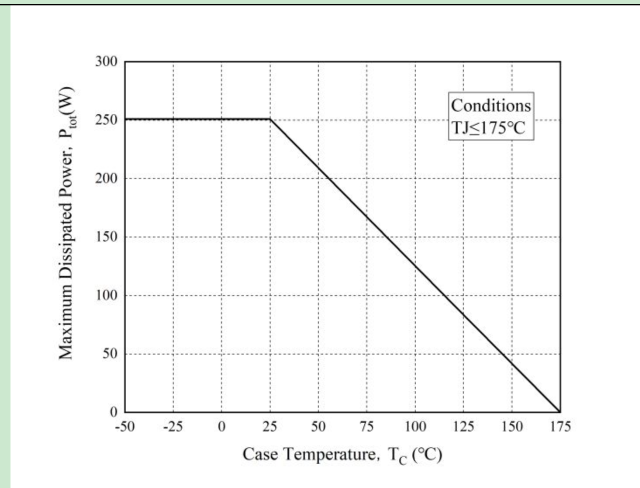


Figure 20. Maximum power dissipation derating vs. case temperature

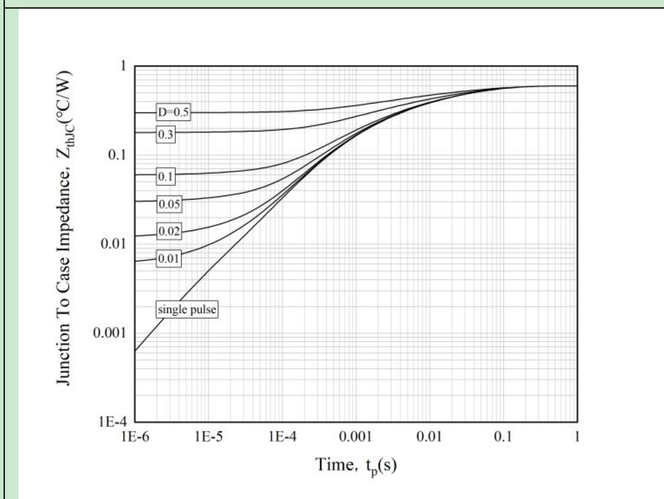


Figure 21. Transient thermal impedance (junction - case)

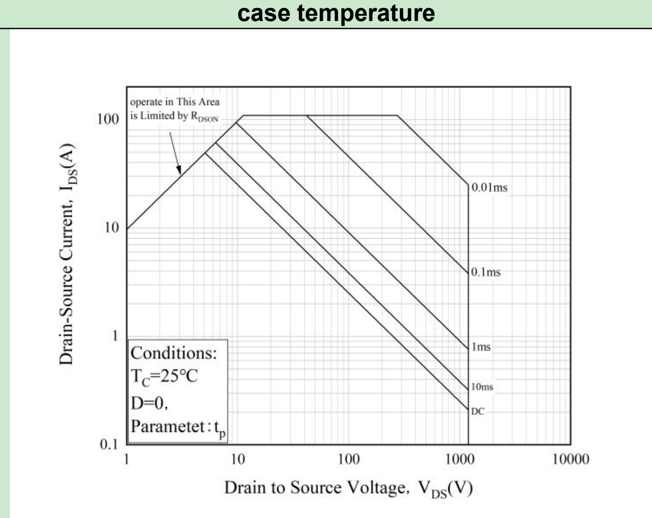


Figure 22. Safe operating area

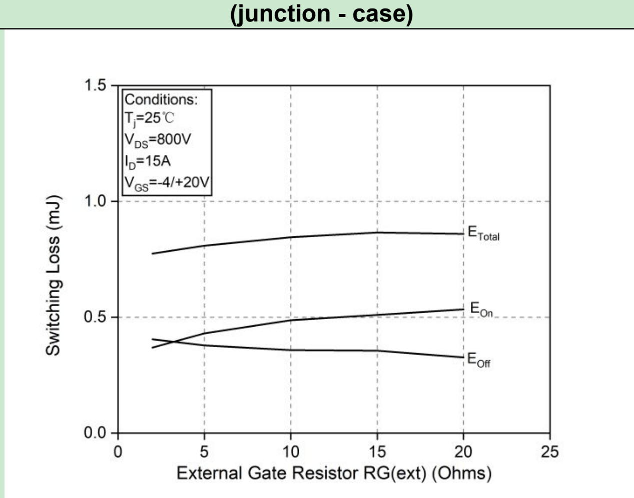


Figure 23. Clamped inductive switching energy vs. R_G(ext)

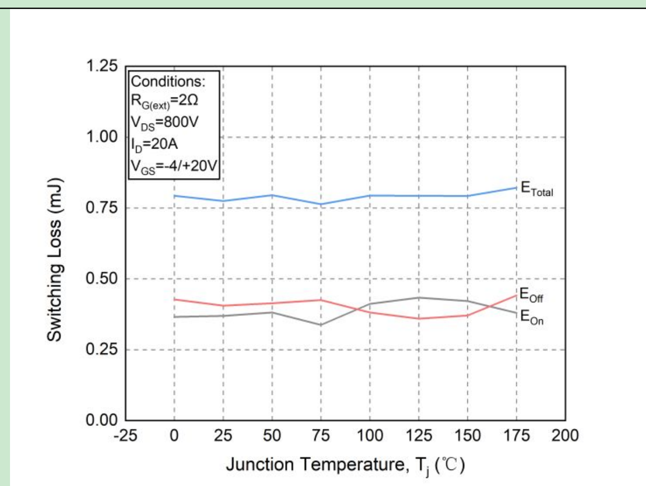


Figure 24. Clamped inductive switching energy vs. temperature

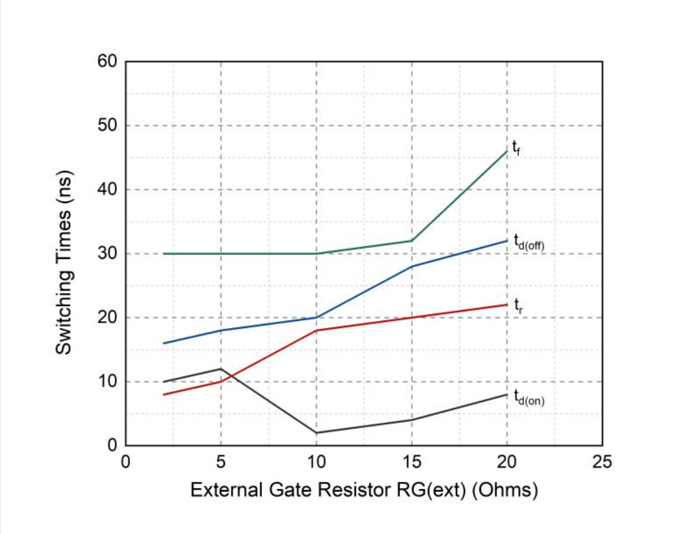
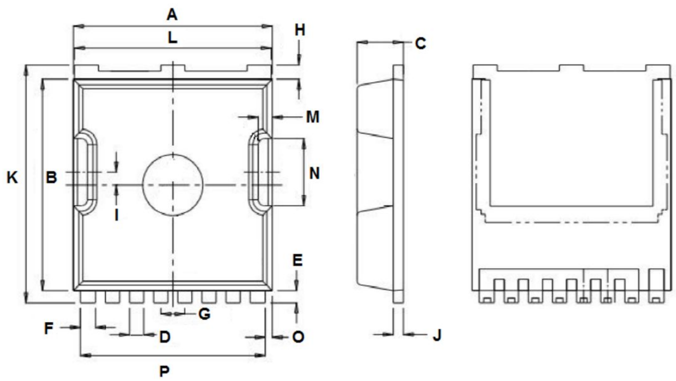


Figure 25. Switching times vs. R_G(ext)

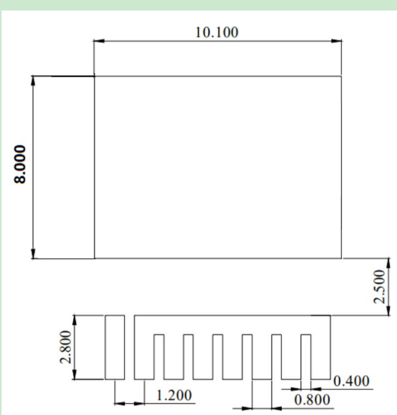
PACKAGE MARKING AND ORDERING INFORMATION

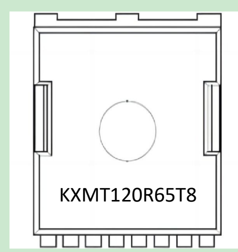
Part Number	Top Marking	Package	Packing Method	Reel Size	Tape Width	Quantity
KXMT120R65T8	KXMT120R65T8	TOLL-8L	Tube-on-Lead	N/A	N/A	30 Units



TOLL		
Dimension	Min.	Max.
A	9.70	10.10
B	10.20	10.60
C	2.10	2.50
D	0.60	0.80
E	0.50	0.70
F	0.65	0.85
G	1.10	1.30
H	0.60	0.80
I	0.55	0.75
J	0.45	0.55
K	11.50	11.90
L	9.60	10.00
M	0.50	0.70
N	3.10	3.50
O	0.25	0.45
P	9.00	9.40

SOLDERING FOOTPRINT





NOTES: UNLESS OTHERWISE SPECIFIED.
A. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.
B. ALL DIMENSIONS ARE IN MILLIMETERS.
C. DRAWING CONFORMS TO ASME Y14.5 - 2009.
D. DIMENSION A1 TO BE MEASURED IN THE REGION DEFINED BY L1.
E. LEAD FINISH IS UNCONTROLLED IN THE REGION DEFINED BY L1.

单击下面可查看定价，库存，交付和生命周期等信息

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