V_{DS}	1200 V
$I_{D\ @\ 25°C}$	31.6 A
$R_{DS(on)}$	80 mΩ

CPM2-1200-0080B

Silicon Carbide Power MOSFET
Z-FET™ MOSFET

N-Channel Enhancement Mode

Features

- High Speed Switching with Low Capacitances
- High Blocking Voltage with Low $R_{DS(on)}$
- Easy to Parallel and Simple to Drive
- Avalanche Ruggedness
- Resistant to Latch-Up
- Halogen Free, RoHS Compliant

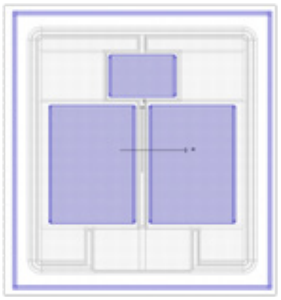
Benefits

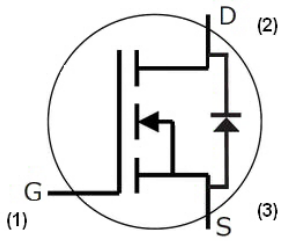
- Higher System Efficiency
- Reduced Cooling Requirements
- Increased System Switching Frequency

Applications

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

Package





Part Number	Package
CPM2-1200-0080B	Die

Maximum Ratings (T_C = 25 °C unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
$I_{DS\ (DC)}$	Continuous Drain Current	31.6	A	V_{GS}@20 V, T_C = 25°C	Note 1
		20		V_{GS}@20 V, T_C = 100°C	
$I_{DS\ (pulse)}$	Pulsed Drain Current	60	A	Pulse width t_P limited by T_{jmax} T_C = 25°C	
V_{GS}	Gate Source Voltage	-10/+25	V		
T_J , T_{stg}	Operating Junction and Storage Temperature	-55 to +150	°C		
T_L	Solder Temperature	260	°C		

Note 1: Assumes a $R_{\theta JC}$ < 0.60 K/W

Electrical Characteristics (T_C = 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} = 0 V, I_D = 100 µA	
$V_{GS(th)}$	Gate Threshold Voltage	1.7	2.2		V	V_{DS} = 10V, I_D = 1 mA	Fig. 7
			3.2			V_{DS} = 10V, I_D = 10 mA	
		1.2	1.7			V_{DS} = 10V, I_D = 1 mA	
I_{DSS}	Zero Gate Voltage Drain Current		1	100	µA	V_{DS} = 1200 V, V_{GS} = 0 V	
			10	250		V_{DS} = 1200 V, V_{GS} = 0 V T_J = 150ºC	
I_{GSS}	Gate-Source Leakage Current			0.25	µA	V_{GS} = 20 V, V_{DS} = 0 V	
$R_{DS(on)}$	Drain-Source On-State Resistance		80	98	mΩ	V_{GS} = 20 V, I_D = 20 A	Fig. 7
			150	208		V_{GS} = 20 V, I_D = 20A, T_J = 150ºC	
g_{fs}	Transconductance		9.8		S	V_{DS}= 20 V, I_{DS}= 20 A	Fig. 6
			8.5			V_{DS}= 20 V, I_{DS}= 20 A, T_J = 150ºC	
C_{iss}	Input Capacitance		950		pF	V_{GS} = 0 V V_{DS} = 1000 V f = 1 MHz V_{AC} = 25 mV	Fig. 15
C_{oss}	Output Capacitance		80				
C_{rss}	Reverse Transfer Capacitance		6.5				
E_{oss}	C_{oss} Stored Energy		40		µJ		Fig. 14
R_G	Internal Gate Resistance		4.6		Ω	f = 1 MHz, V_{AC} = 25 mV	

Built-in SiC Body Diode Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_{SD}	Diode Forward Voltage	3.3		V	V_{GS} = -5 V, I_F=10 A, T_J = 25 ºC	Fig. 9
		3.1			V_{GS} = -2 V, I_F=10 A, T_J = 25 ºC	
t_{rr}	Reverse Recovery Time	40		ns	V_{GS} = -5 V, I_F=20 A, T_J = 25 ºC V_R = 800 V, di_F/dt= 350 A/µs	
Q_{rr}	Reverse Recovery Charge	165		nC		
I_{rrm}	Peak Reverse Recovery Current	6.4		A		

Gate Charge Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
Q_{gs}	Gate to Source Charge	10.8		nC	V_{DS} = 800 V, V_{GS} = 0/20 V I_D =20 A Per JEDEC24 pg 27	Fig. 16
Q_{gd}	Gate to Drain Charge	18.0				
Q_g	Gate Charge Total	49.2				

*** NOTE 1: For inductive and resistive switching data and waveforms please refer to data-sheet for packaged device. Part number C2M0080120D.**

Typical Performance

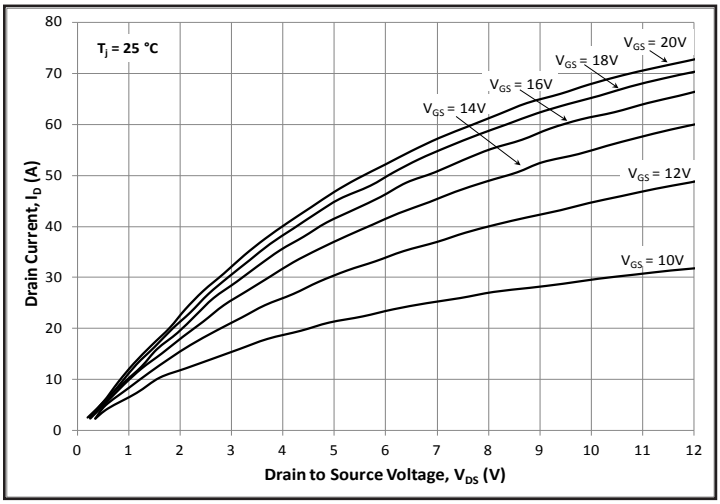


Figure 1. Typical Output Characteristics T_J = 25 ºC

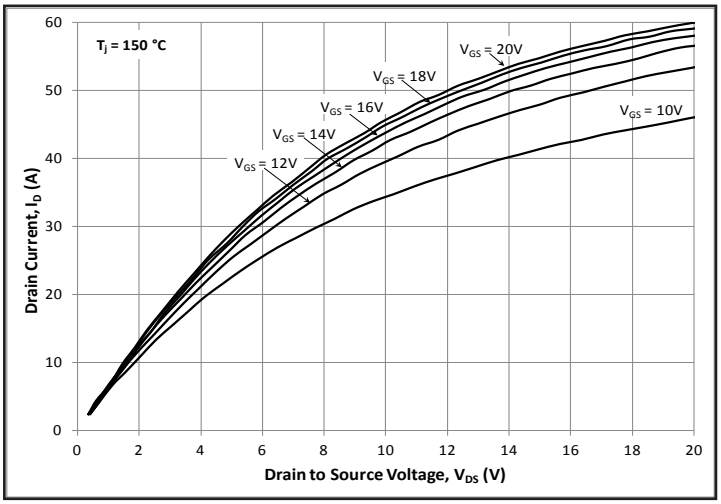


Figure 2. Typical Output Characteristics T_J = 150 ºC

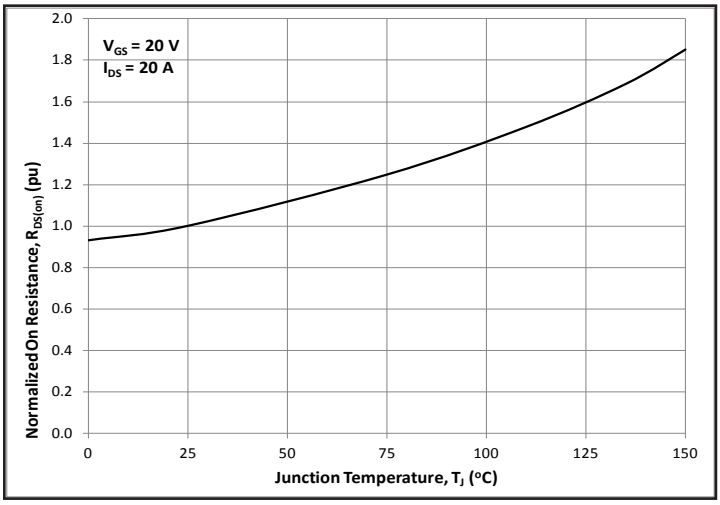


Figure 3. Normalized On-Resistance vs. Temperature

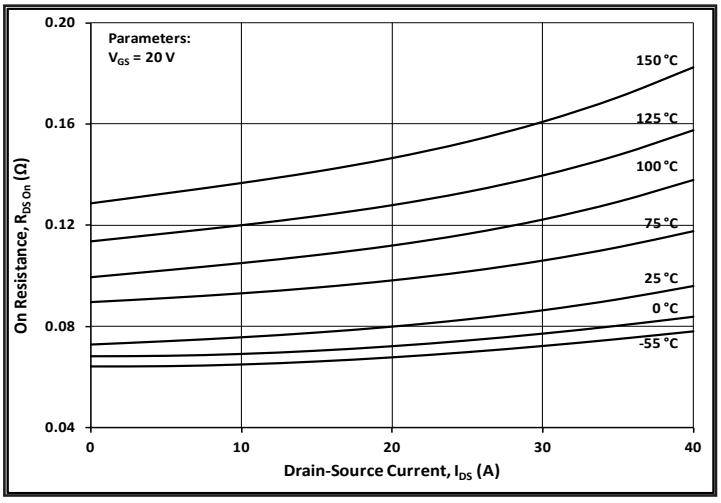


Figure 4. On-Resistance vs. Drain Current

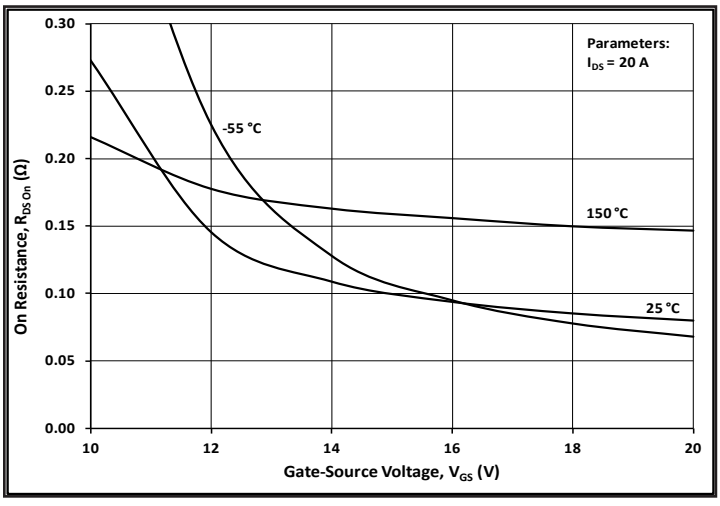


Figure 5. On-Resistance vs. Gate Voltage

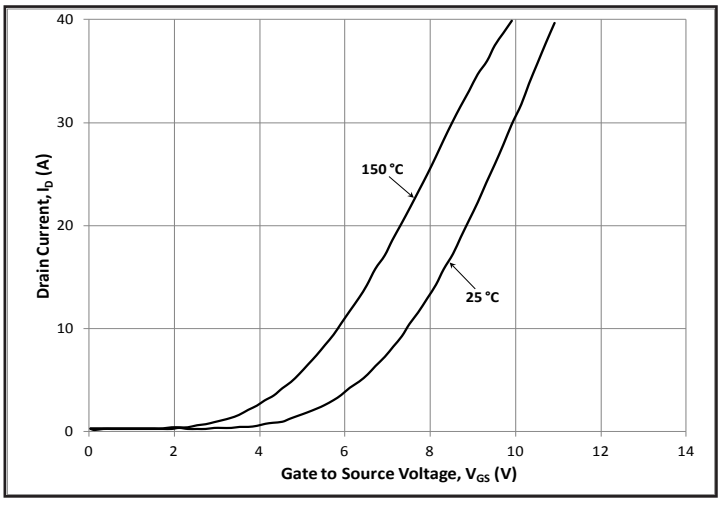


Figure 6. Typical Transfer Characteristics

Typical Performance

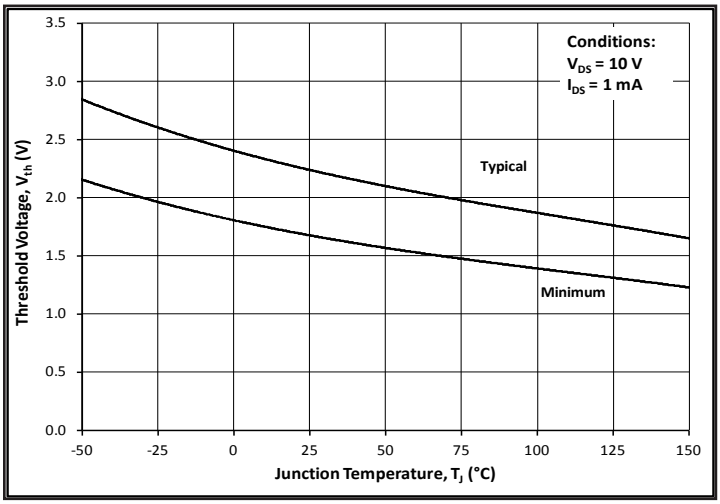


Figure 7. Typical and Minimum Threshold Voltage vs. Temperature

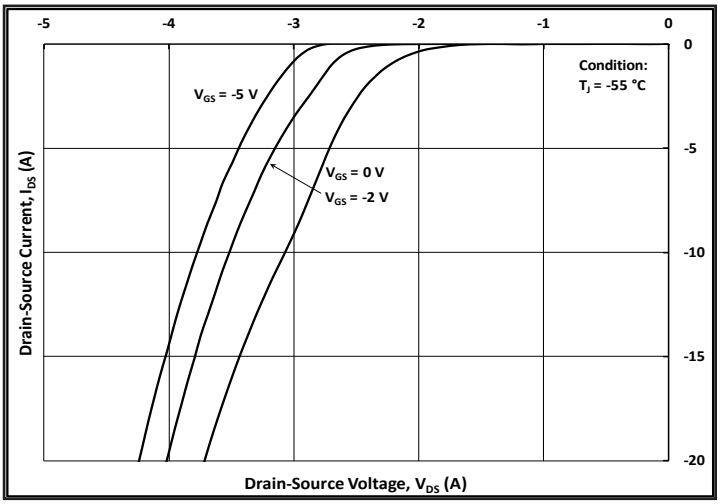


Figure 8. Typical Body Diode Characteristics T_J = -55 ºC

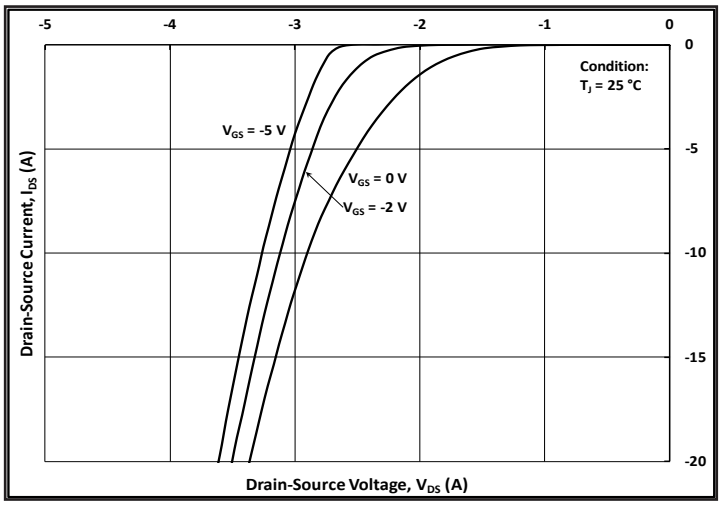


Figure 9. Typical Body Diode Characteristics T_J = 25 ºC

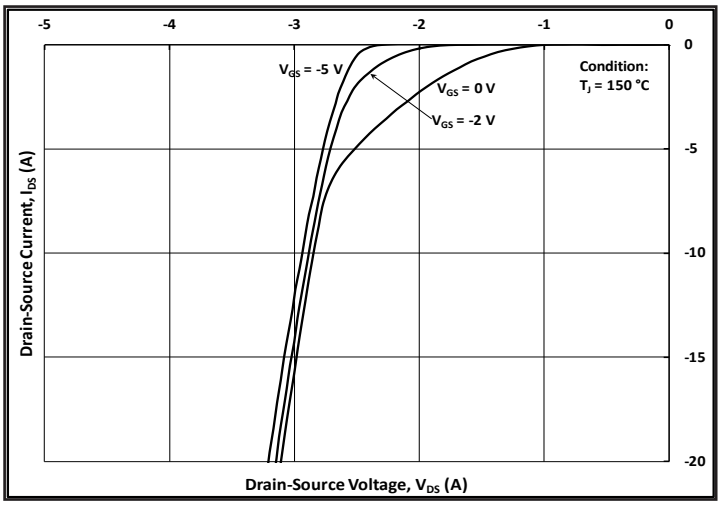


Figure 10. Typical Body Diode Characteristics T_J = 150 ºC

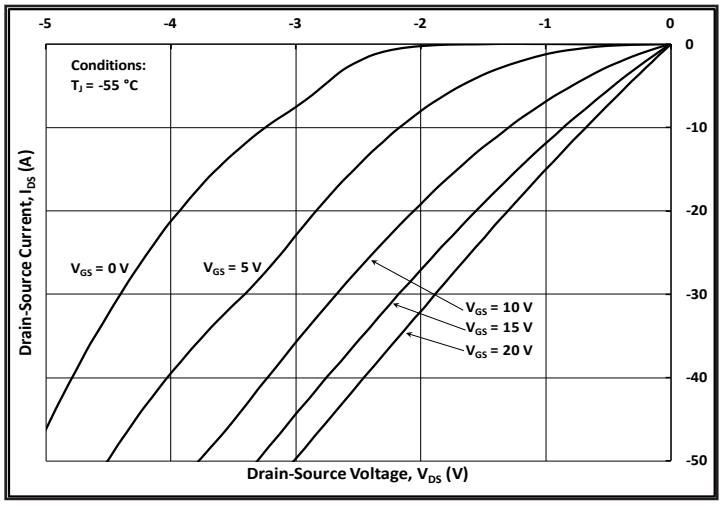


Figure 11. Typical 3rd Quadrant Characteristics T_J = -55 ºC

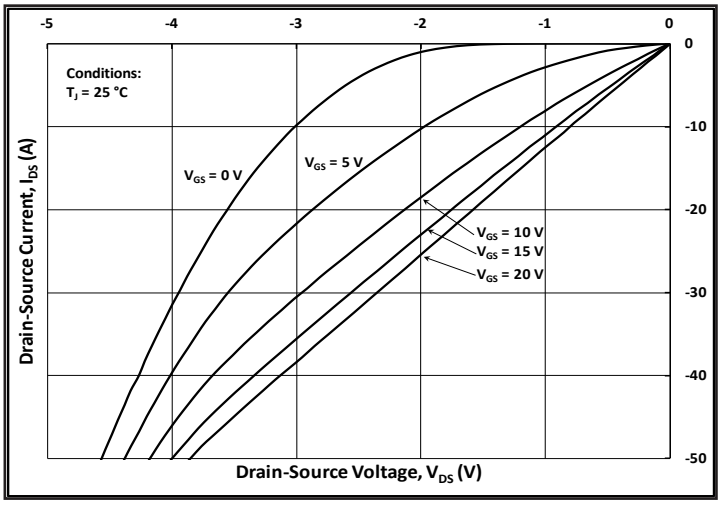


Figure 12. Typical 3rd Quadrant Characteristics T_J = 25 ºC

Typical Performance

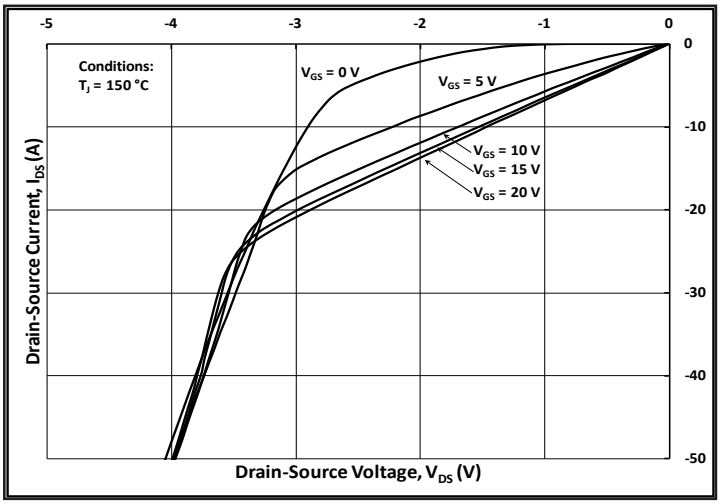


Figure 13. Typical 3rd Quadrant Characteristics Characteristic T_J = 150 ºC

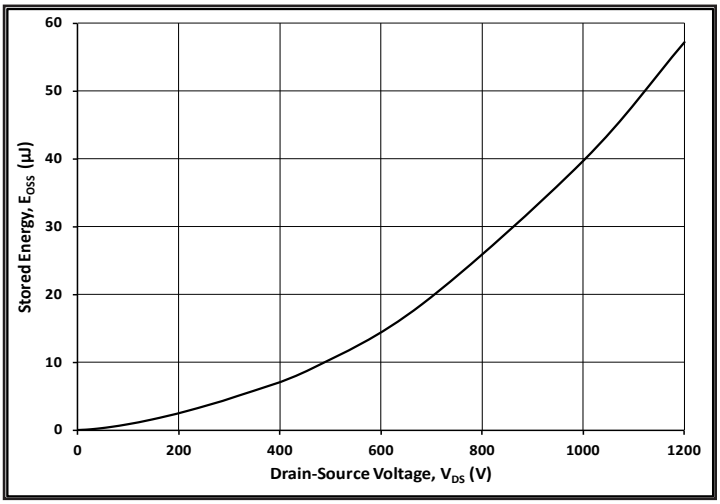
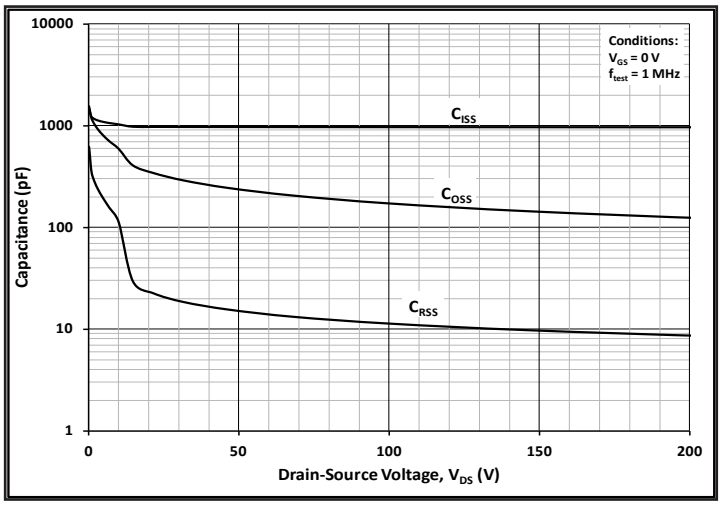


Figure 14. Typical transfer Characteristics



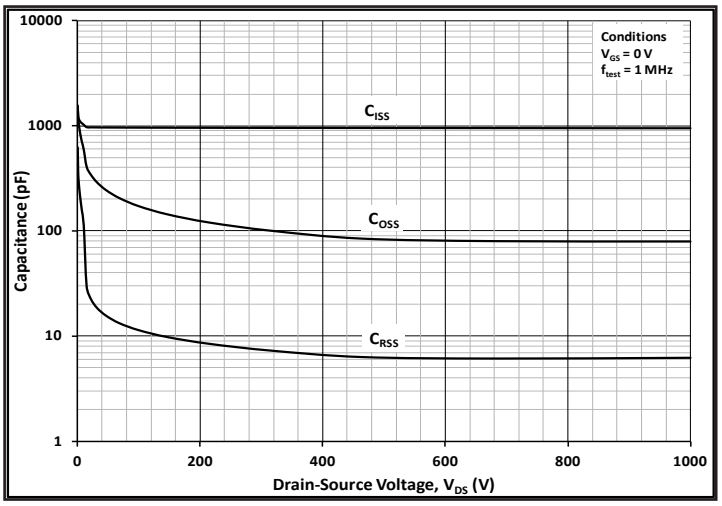


Figure 15A and 15B. Typical Capacitances vs. Drain Voltage at V_{GS} = 0 V and f = 1 MHz

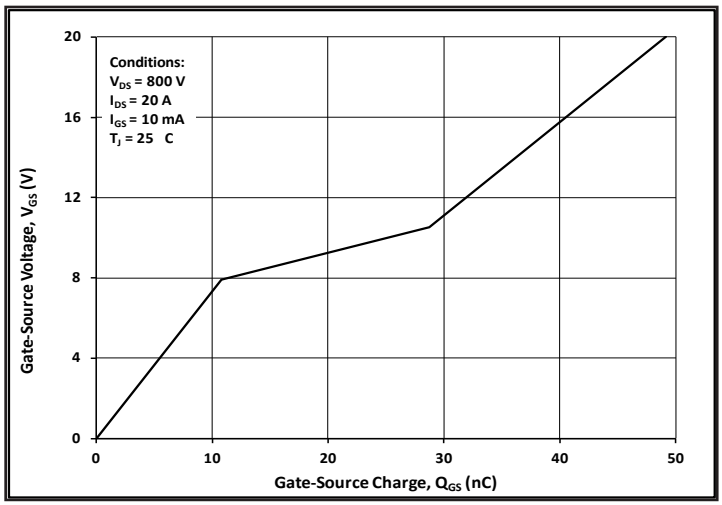
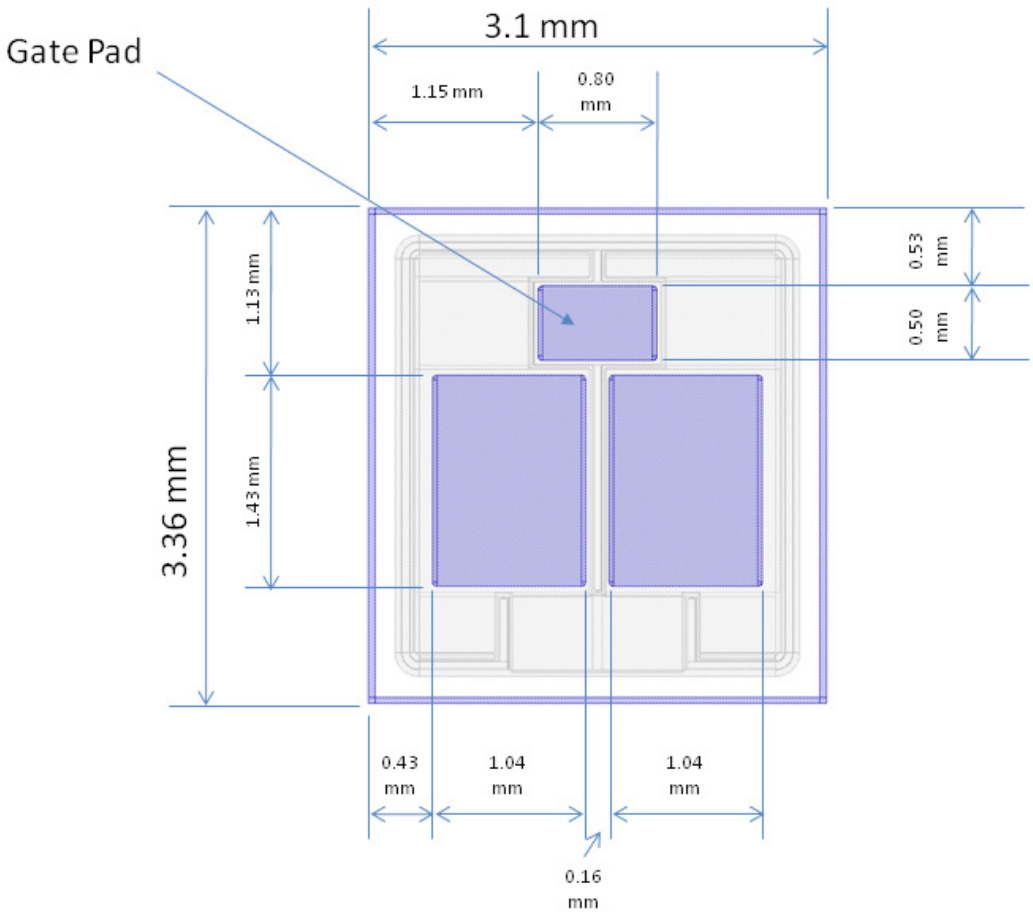


Figure 16. Typical Gate Characteristic 25 ºC

Mechanical Parameters

Parameter	Typical Value	Unit
Die Dimensions (L x W)	3.10 × 3.36	mm
Exposed Source Pad Metal Dimensions (LxW) Each	1.04 × 1.43	mm
Gate Pad Dimensions (L x W)	0.80 × 0.50	mm
Die Thickness	180 ± 40	µm
Top Side Source metallization (Al)	4	µm
Top Side Gate metallization (Al)	4	µm
Bottom Drain metallization (Ni/Ag)	0.8 / 0.6	µm

Chip Dimensions



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