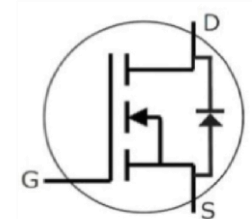
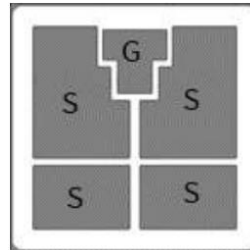


CPM4-0230-0255ES0A

Wolfspeed SiC Gen 4 MOSFET

Description

This is Wolfspeed's 4th generation of high-performance silicon carbide MOSFET in a package less bare die format to be implemented into any custom module design. The high blocking voltage with low on-resistance, high speed switching with low capacitance makes this MOSFET ideal for high frequency switching applications including solar inverters and uninterrupted power supplies.



Package Types: Bare Die
PN's: CPM4-0230-0255ES0A

Features

- 4th Generation SiC MOSFET
- High blocking voltage with low on-resistance
- High speed switching with low capacitance
- Fast intrinsic diode with low reverse recovery

Typical Applications

- UPS
- Renewable Energy (Central Solar and Wind)
- Medium Voltage Drives
- Smart Grid

Absolute Maximum Ratings

Stress beyond those listed under absolute maximum ratings may damage the device.

Parameter	Symbol	Rating	Unit
Drain-Source Voltage, across T_{vj}	$V_{DS(max)}$	2300	V
Maximum Gate-Source Voltage, Peak Transient Capability	$V_{GS(max)}$	-8/+19	V
Continuous Drain Current, $V_{GS} = 15$ V, assumes die packaged in TO-247 package with $R_{th(j-c)} < 0.27$ K/W	I_D	$T_c = 25^\circ\text{C}$	A
		$T_c = 100^\circ\text{C}$	
Pulsed Drain Current, t_p limited by $T_{vj(max)}$	$I_{D(pulse)}$	166	A
Virtual Junction and Storage Temperature	T_{vj}, T_{stg}	-55 to +175	$^\circ\text{C}$
Maximum Processing Temperature, in non-reactive ambient	T_{proc}	325	$^\circ\text{C}$

Recommended Operating Conditions

Parameter	Symbol	Rating	Unit
Recommended Operating Gate-Source Voltage	$V_{GS(op)}$	-4 / +15	V

Electrical Characteristics ($T_{VJ} = 25^{\circ}\text{C}$)

Characteristics	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	2300			V	$V_{GS} = 0\text{ V}$, $I_D = 100\text{ }\mu\text{A}$
Gate Threshold Voltage	$V_{GS(th)}$	1.8	2.5	3.6	V	$V_{DS} = V_{GS}$, $I_{DS} = 19\text{ mA}$
			2.2		V	$V_{DS} = V_{GS}$, $I_{DS} = 19\text{ mA}$, $T_{VJ} = 175^{\circ}\text{C}$
Zero Gate Voltage Drain Current	I_{DSS}		1		μA	$V_{DS} = 2300\text{ V}$, $V_{GS} = 0\text{ V}$
Gate-Source Leakage Current	I_{GSS}		10		nA	$V_{GS} = 15\text{ V}$, $V_{DS} = 0\text{ V}$
Drain-Source On-State Resistance	$R_{DS(on)}$		30	39	m Ω	$V_{GS} = 15\text{ V}$, $I_D = 69\text{ A}$
			87			$V_{GS} = 15\text{ V}$, $I_D = 69\text{ A}$, $T_{VJ} = 175^{\circ}\text{C}$
Transconductance	G_{fs}		50		S	$V_{DS} = 20\text{ V}$, $I_D = 69\text{ A}$
			46			$V_{DS} = 20\text{ V}$, $I_D = 69\text{ A}$, $T_{VJ} = 175^{\circ}\text{C}$
Input Capacitance	C_{iss}		6		pF	$V_{GS} = 0\text{ V}$, $V_{DS} = 1500\text{ V}$ $f = 100\text{ kHz}$ $V_{AC} = 25\text{ mV}$
Output Capacitance	C_{oss}		102			
Reverse Transfer Capacitance	C_{rss}		10			
C_{oss} Stored Energy	E_{oss}		113		μJ	$V_{DS} = 1500\text{ V}$, $f = 100\text{ kHz}$
Internal Gate Resistance	$R_{G(int)}$		10		Ω	$f = 100\text{ kHz}$, $V_{AC} = 25\text{ mV}$
Gate to Source Charge	Q_{gs}		46		nC	$V_{DS} = 1500\text{ V}$, $V_{GS} = -4\text{ V}/+15\text{ V}$ $I_D = 69\text{ A}$
Gate to Drain Charge	Q_{gd}		39			
Total Gate Charge	Q_g		147			

Reverse Diode Characteristics ($T_{VJ} = 25^{\circ}\text{C}$)

Characteristics	Symbol	Typ.	Max.	Unit	Test Conditions
Diode Forward Voltage	V_{SD}	5.5		V	$V_{GS} = -4\text{ V}$, $I_{SD} = 35\text{ A}$
		4.9		V	$V_{GS} = -4\text{ V}$, $I_{SD} = 35\text{ A}$, $T_{VJ} = 175^{\circ}\text{C}$
Reverse Recovery Time	t_{rr}	16		ns	$V_{GS} = -4\text{ V}$, $I_{SD} = 35\text{ A}$, $V_R = 1500\text{ V}$ $dif/dt = 3.5\text{ A/ns}$, $T_{VJ} = 175^{\circ}\text{C}$
Reverse Recovery Charge	Q_{rr}	256		nC	
Peak Reverse Recovery Current	I_{rrm}	28		A	

Typical Performance

All the graphs are based on a die placed in a TO-247-4L package.

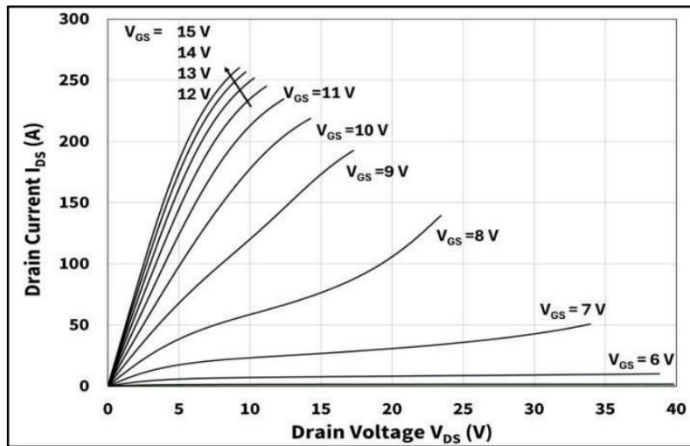


Figure 1.

Output Characteristics $T_{VJ} = -55\text{ }^{\circ}\text{C}$

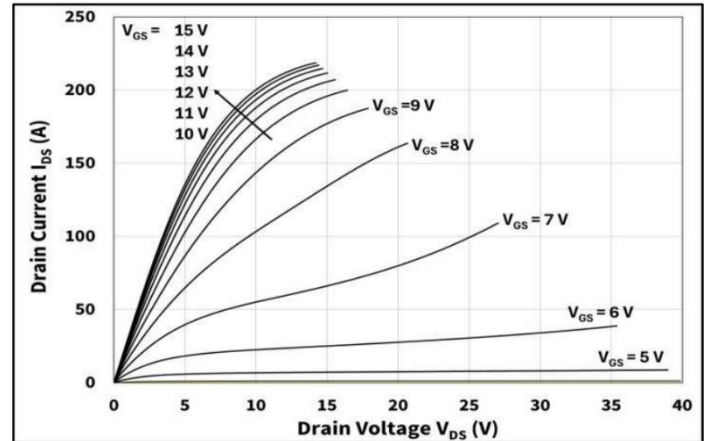


Figure 2.

Output Characteristics $T_{VJ} = 25\text{ }^{\circ}\text{C}$

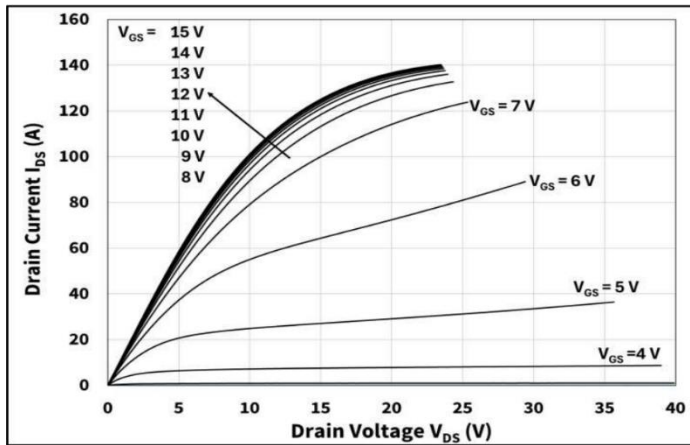


Figure 3.

Output Characteristics $T_{VJ} = 175\text{ }^{\circ}\text{C}$

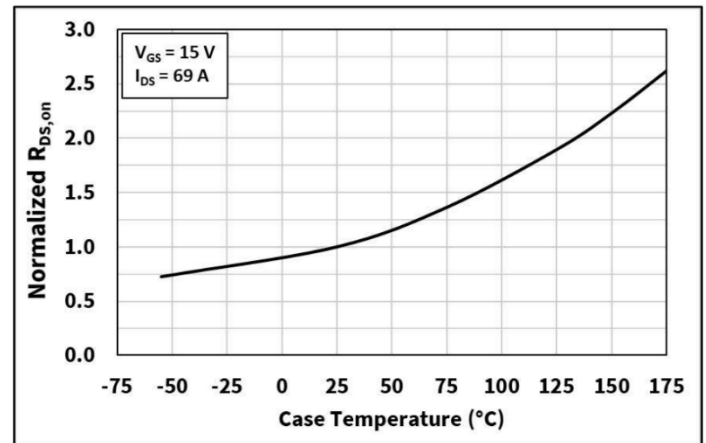


Figure 4.

Normalized On-Resistance vs. Temperature

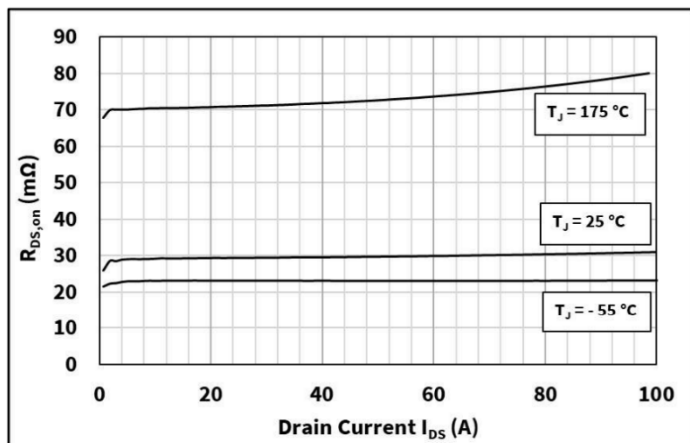


Figure 5.

On-Resistance vs. Drain Current for Various Temperatures

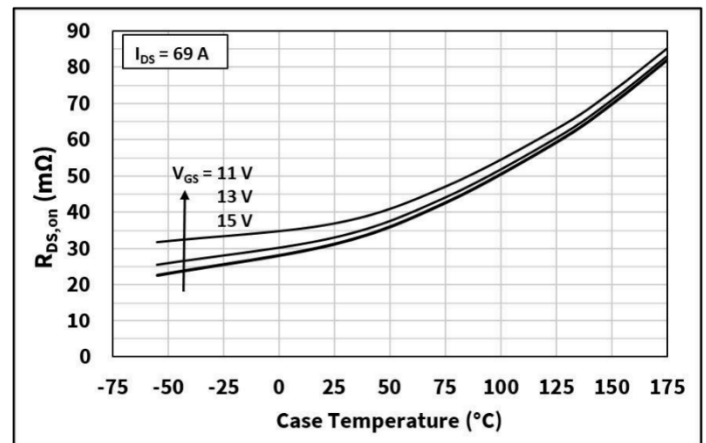


Figure 6.

On-Resistance vs. Temperature for Various Gate Voltages

Typical Performance

All the graphs are based on a die placed in a TO-247-4L package.

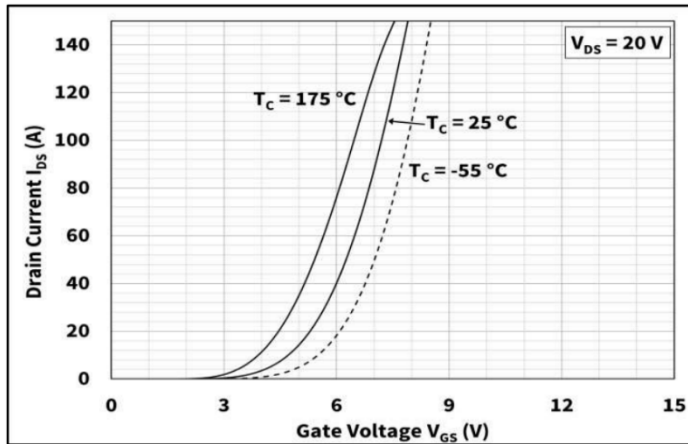


Figure 7.

Transfer Characteristic for Various Junction Temperatures

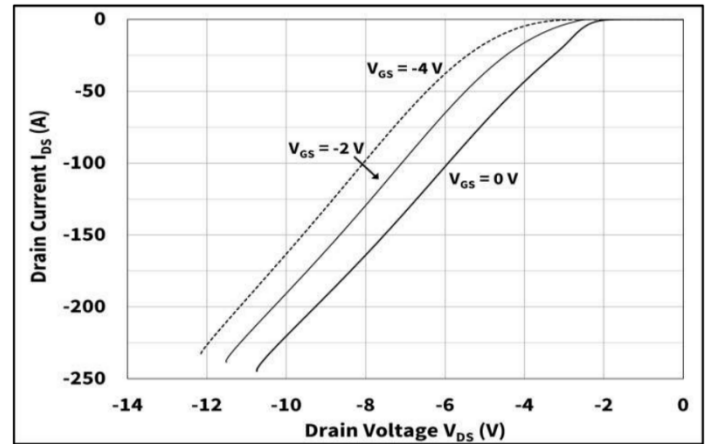


Figure 8.

Body Diode Characteristic at $T_{VJ} = -55\text{ }^{\circ}\text{C}$

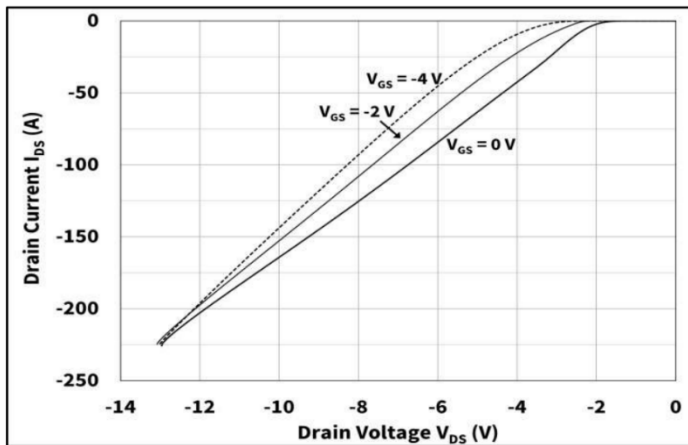


Figure 9.

Body Diode Characteristic at $T_{VJ} = 25\text{ }^{\circ}\text{C}$

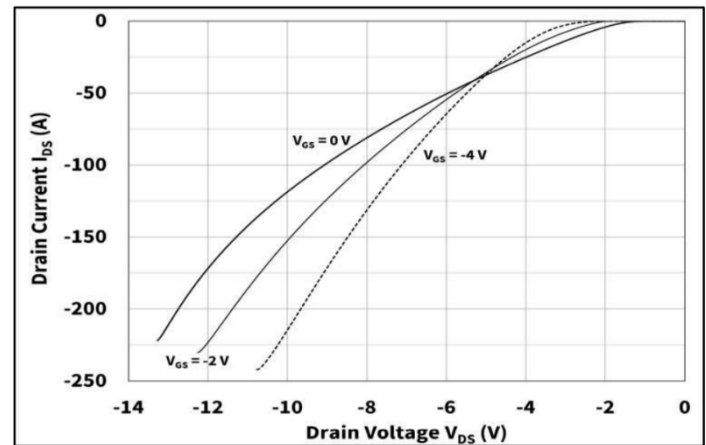


Figure 10.

Body Diode Characteristic at $T_{VJ} = 175\text{ }^{\circ}\text{C}$

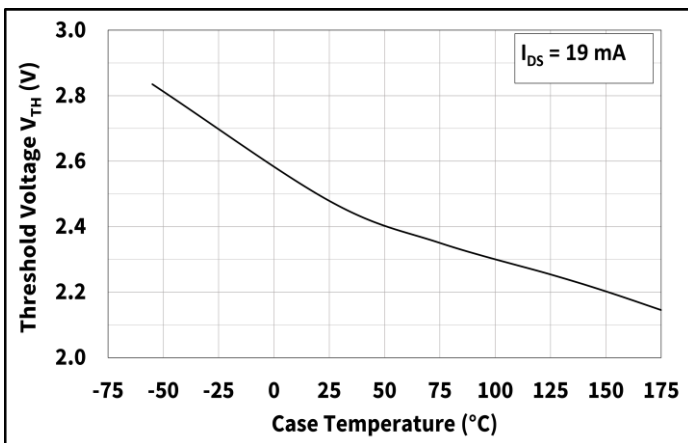


Figure 11.

Threshold Voltage vs. Temperature

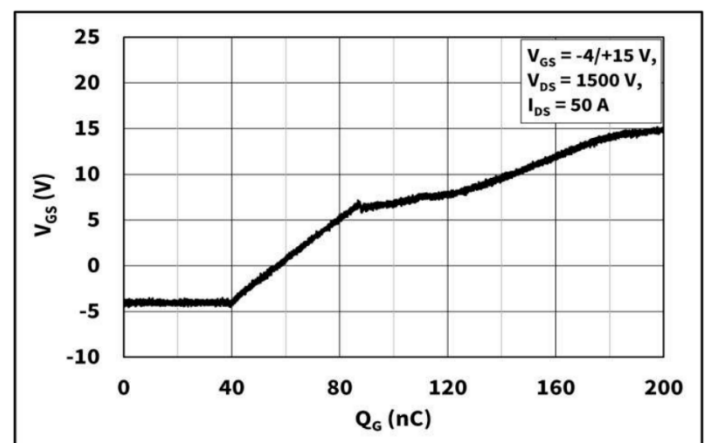


Figure 12.

Gate Charge Characteristics

Typical Performance

All the graphs are based on a die placed in a TO-247-4L package.

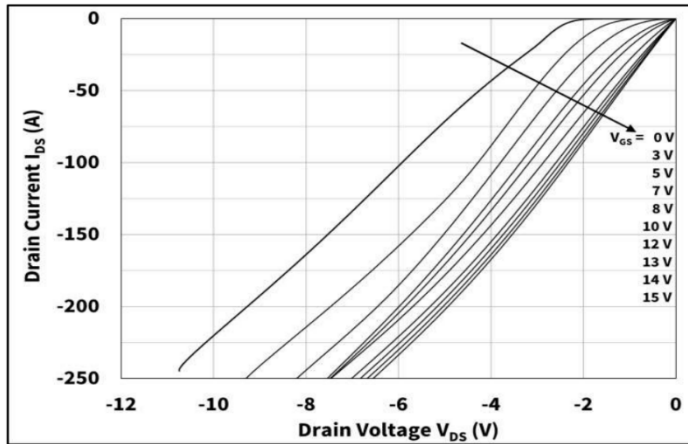


Figure 13.

3rd Quadrant Characteristic at $T_{VJ} = -55^{\circ}\text{C}$

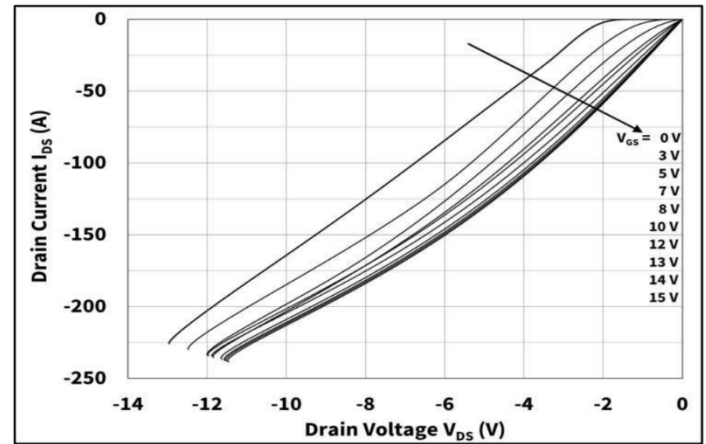


Figure 14.

3rd Quadrant Characteristic at $T_{VJ} = 25^{\circ}\text{C}$

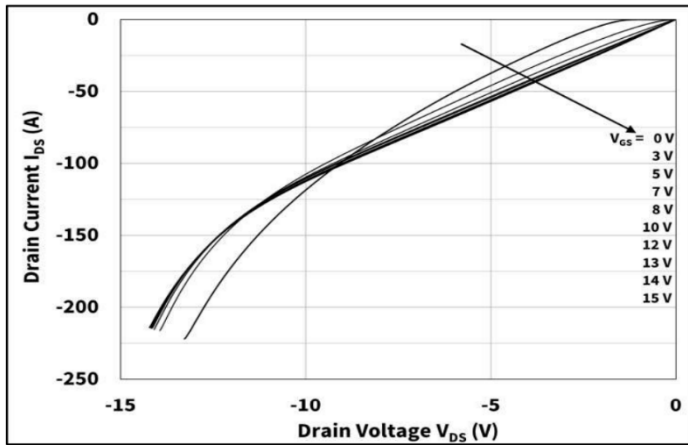


Figure 15.

3rd Quadrant Characteristic at $T_{VJ} = 175^{\circ}\text{C}$

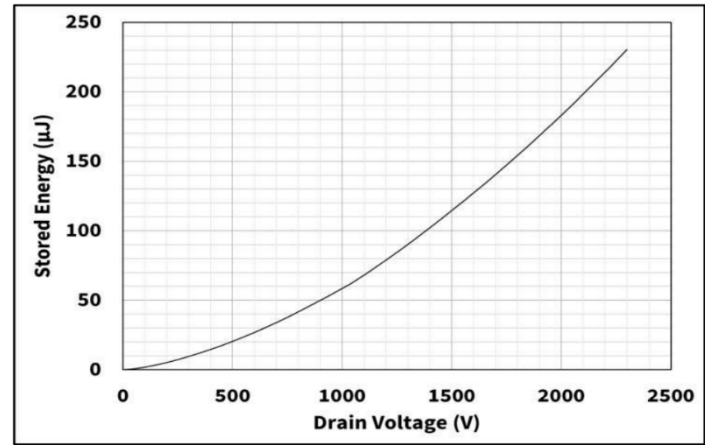


Figure 16.

Output Capacitor Stored Energy

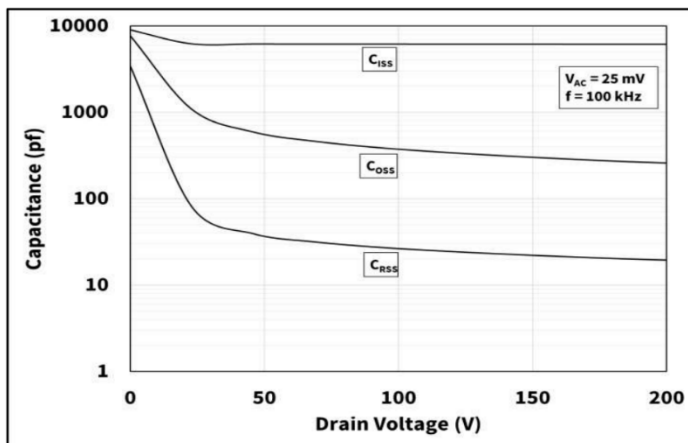


Figure 17.

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

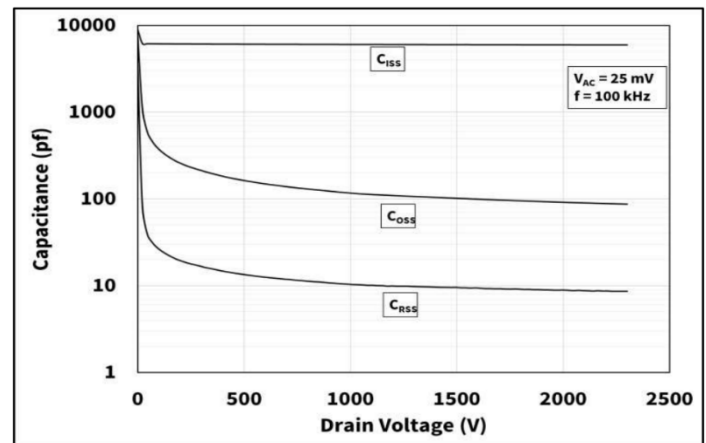
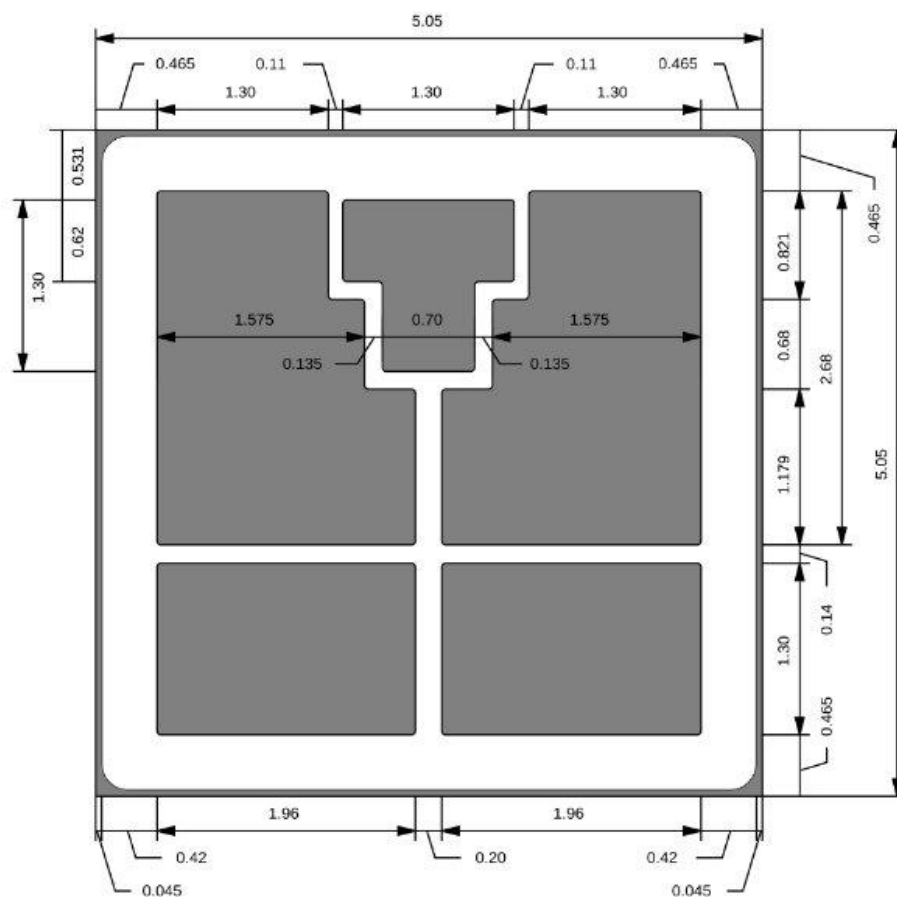


Figure 18.

Capacitances vs. Drain-Source Voltage (0-2300V)

Product Dimensions CPM4-0230-0255ES0A



Product Dimensions CPM4-0230-0255ES0A

Parameter	Typical	Units
Die Size (L x W)	5.05 x 5.05	mm
Exposed Source Pad Metal Dimensions	1.96 x 1.30 (x 2)	mm
Exposed Source Pad Metal Dimensions	1.96 x 1.18 (x 2), 1.58 x 0.68 (x 2), 1.3 x 0.82 (x 2)	mm
Gate Pad Dimensions	1.3 x 0.62, 0.68 x 0.70	mm
Chip Thickness ¹	180	μm
Frontside (Source) metalization (Al)	4	μm
Frontside (Gate) metalization (Al)	4	μm
Backside (Drain) metalization (Ni:Pd:Au)	0.6/0.2/0.1	μm

¹ SiC wafer thickness



Product Ordering Information

Order Number	Description	Package
CPM4-0230-0255ES0A-GQ8	2300V/30mΩ SiC MOSFET G4 IND UV MVF	Bare Die Product

Revision History

Revision History	Date of Change	Brief Summary
1	1/21/2025	Initial Release



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