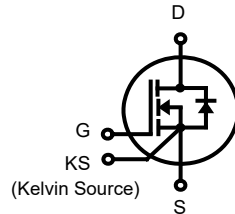


Silicon Carbide Enhancement Mode MOSFET

Features

- ◆ $V_{DSS} = 1200V$
- ◆ $R_{DS(ON)}$ Typ. $5\text{ m}\Omega @ V_{GS} = 15V$
- ◆ Fully Avalanche Rated
- ◆ Pb Free & RoHS Compliant
- ◆ Isolation Type Package
- ◆ Electrically Isolation base plate



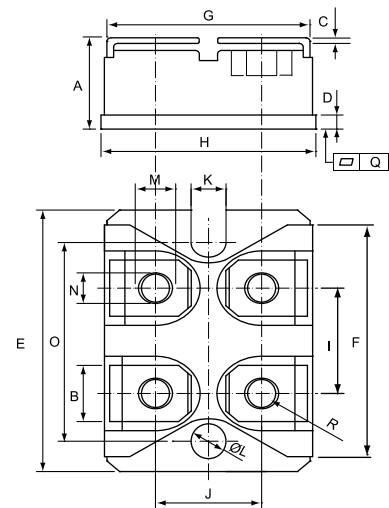
Dimensions in inches and (millimeters)

Applications

- ◆ Solar Inverters
- ◆ Power Converters
- ◆ Motor Drive
- ◆ Switch Mode Power Supplies
- ◆ Battery Chargers

Absolute Maximum Ratings ($T_c=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Rated	Unit
Drain-Source Voltage	V_{DS}	1200	V
Gate-Source Voltage	V_{GS}	-10/+20	V
Drain Current-Continuous	I_D	450 300	A
		@ $T_c = 25^\circ\text{C}$ @ $T_c = 100^\circ\text{C}$	
Drain Current-Pulsed	I_{DM}	900	A
		@ $T_c = 25^\circ\text{C}$	
Maximum Power Dissipation	P_D	1360	W
Storage Temperature Range	T_{STG}	-55 to +175	$^\circ\text{C}$
Operating Junction Temperature Range	T_{VJ}	-55 to +175	$^\circ\text{C}$
Thermal Resistance, Junction-to-Case	$R_{\theta_{JC}}$	0.11	$^\circ\text{C/W}$
Isolation Voltage (A.C. 1 minute) between All Terminals and Baseplate	V_{iso}	2500	V
Mounting torque (M4 Screw)	M_d	1.3 1.1	Nm
		To heatsink To terminals	



	DIMENSIONS			
	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.460	0.483	11.68	12.28
B	0.307	0.323	7.80	8.20
C	0.030	0.033	0.75	0.85
D	0.071	0.081	1.80	2.05
E	1.488	1.504	37.80	38.20
F	1.248	1.260	31.70	32.00
G	0.917	0.957	23.30	24.30
H	0.996	1.008	25.30	25.60
I	0.579	0.602	14.70	15.30
J	0.492	0.516	12.50	13.10
K	0.161	0.169	4.10	4.30
L	0.161	0.169	4.10	4.30
M	0.181	0.197	4.60	5.00
N	0.165	0.181	4.20	4.60
O	1.181	1.197	30.00	30.40
Q	-0.002	0.004	-0.05	0.10
R	M4*8			

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit		
OFF Characteristics								
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V$ $I_{DS} = 0.1mA$	1200	-	-	V		
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS} = 0V$ $V_{DS} = 1200V$	-	-	200	μA		
Gate-Body Leakage	I_{GSS}	$V_{GS} = 20V$ $V_{DS} = 0V$	-	-	500	nA		
ON Characteristics								
Gate Threshold Voltage	V_{TH}	$V_{DS} = V_{GS}$ $I_{DS} = 8mA$	2.0	2.5	4.5	V		
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 15V$ $I_{DS} = 100A$	-	5	-	m Ω		
Gate Resistance	$R_{G(int)}$		-	3.1	-	Ω		
Dynamic Characteristics								
Input Capacitance	C_{iss}	$V_{DS} = 800V$ $V_{GS} = 0V$	-	19	-	nF		
Output Capacitance	C_{oss}	$V_{AC} = 1V$	-	642	-	pF		
Reverse Transfer Capacitance	C_{rss}	Freq.=1MHz	-	37	-			
Total Gate Charge	Q_g	$V_{DS} = 800V$ $V_{GS} = -4V/+15V$ $I_{DS} = 225A$	-	609	-	nC		
Gate to Source Charge	Q_{gs}		-	176	-			
Gate to Drain Charge	Q_{gd}		-	220	-			
Switching Characteristics								
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 800V$ $V_{GS} = -4/+15V$ $I_{DS} = 225A$ $R_G = 1.0\Omega$	$T_{VJ} = 25^{\circ}\text{C}$	-	95	-	ns	
			$T_{VJ} = 125^{\circ}\text{C}$	-	90	-		
Rise Time	t_r		$T_{VJ} = 25^{\circ}\text{C}$	-	76	-		
			$T_{VJ} = 125^{\circ}\text{C}$	-	150	-		
Turn-Off Delay Time	$t_{d(off)}$		$T_{VJ} = 25^{\circ}\text{C}$	-	138	-		
			$T_{VJ} = 125^{\circ}\text{C}$	-	157	-		
Fall Time	t_f		$T_{VJ} = 25^{\circ}\text{C}$	-	15	-		
			$T_{VJ} = 125^{\circ}\text{C}$	-	15	-		
Turn-On Switching Energy	E_{on}		$V_{DD} = 800V$ $V_{GS} = -4V/+15V$ $I_D = 225A$ $R_{G(ext)} = 1.0\Omega$	$T_{VJ} = 25^{\circ}\text{C}$	-	8.2	-	mJ
			$T_{VJ} = 125^{\circ}\text{C}$	-	14.5	-		
Turn-Off Switching Energy	E_{off}	$T_{VJ} = 25^{\circ}\text{C}$	-	5.2	-			
		$T_{VJ} = 125^{\circ}\text{C}$	-	5.3	-			
Body Diode Characteristics , at $T_J = 25^{\circ}\text{C}$, unless otherwise specified								
Continuous Diode Fwd Current	I_{SDC}	$V_{GS} = 0V$	-	300	-	A		
Drain-Source Reverse Voltage	V_{SD}	$I_{SD} = 300A$, $V_{GS} = 0V$	-	4.3	-	V		
MOSFET Forward Recovery Charge	Q_{rr}	$V_{DD} = 800V, I_{SD} = 225A,$ $V_{GS} = 0V, di/dt = 4032A/\mu s$	-	1406	-	nC		
MOSFET Peak Forward Recovery Current	I_{rr}	$V_{DD} = 800V, I_{SD} = 225A,$ $V_{GS} = 0V, di/dt = 4032A/\mu s$	-	60	-	A		
MOSFET Reverse Recovery Time	T_{rr}	$V_{DD} = 800V, I_{SD} = 225A,$ $V_{GS} = 0V, di/dt = 4032A/\mu s$	-	39	-	ns		

Notes:

1. Pulse Test: Pulse Width $\leq 300 \mu s$, Duty Cycle $> 2\%$.

Typical Characteristics

Fig.1 Output Characteristics at $T_J = 25^\circ\text{C}$

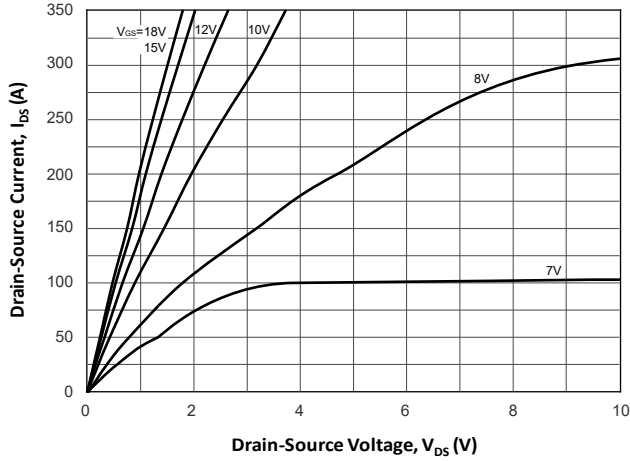


Fig.2 Output Characteristics at $T_J = 125^\circ\text{C}$

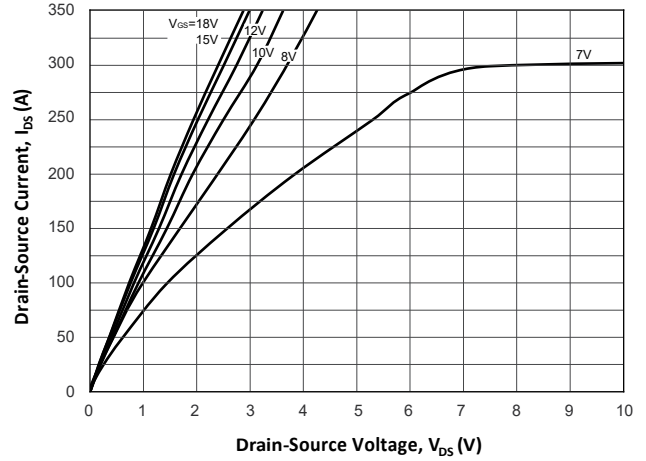


Fig.3 Drain Source on Resistance

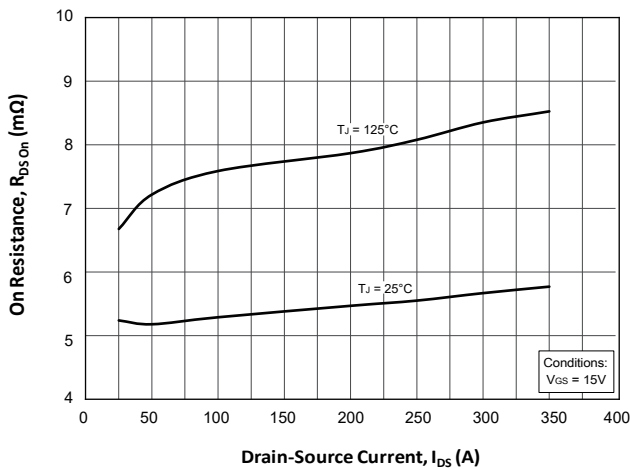


Fig.4 Transfer Characteristics

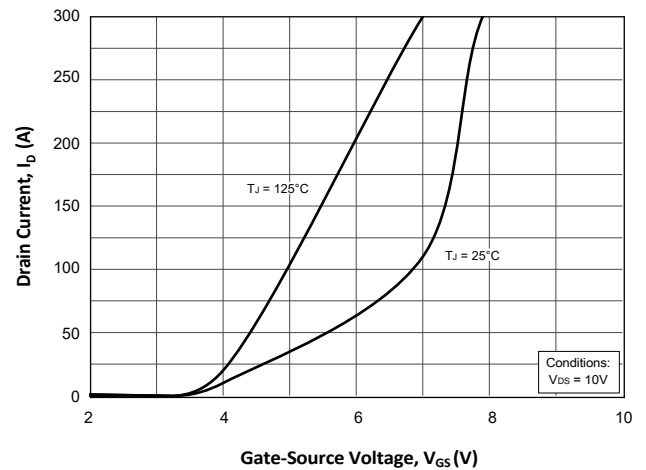


Fig.5 Capacitances vs. Drain-Source Voltage

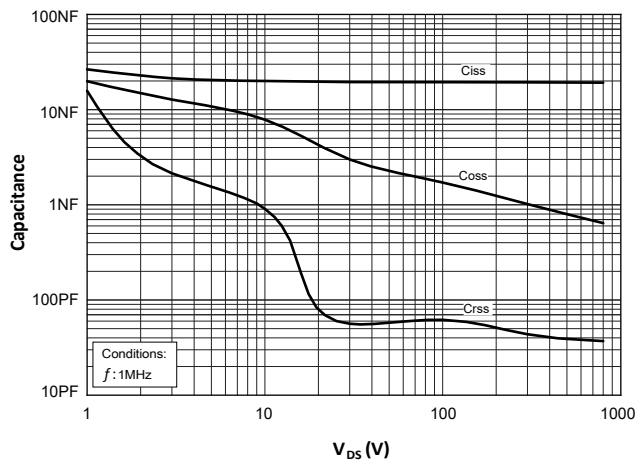
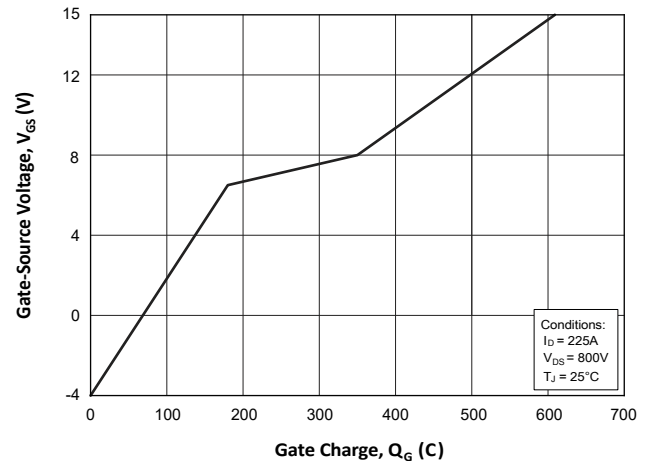


Fig.6 Gate Charge Characteristics



Typical Characteristics

Fig.7 Switching losses vs R_G change $T_J=25^\circ\text{C}$

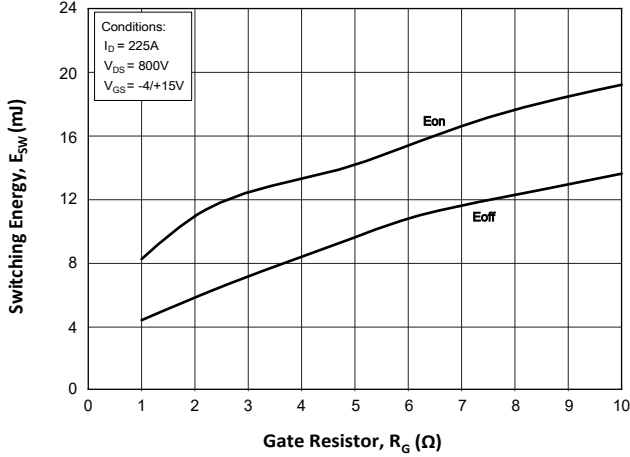


Fig.8 Switching losses vs R_G change $T_J=125^\circ\text{C}$

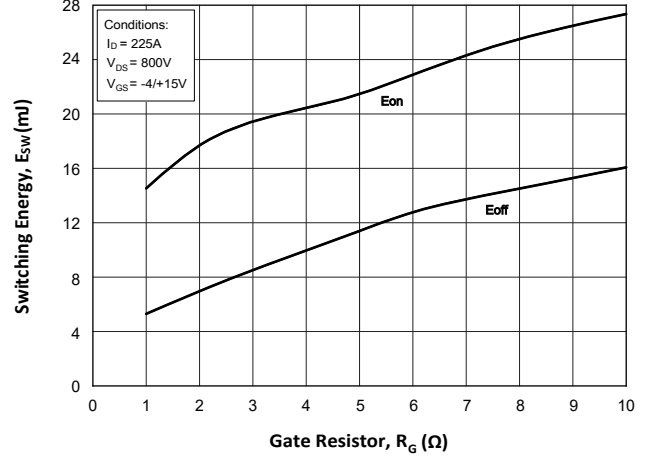


Fig.9 Switching Timer vs R_G Change $T_J=25^\circ\text{C}$

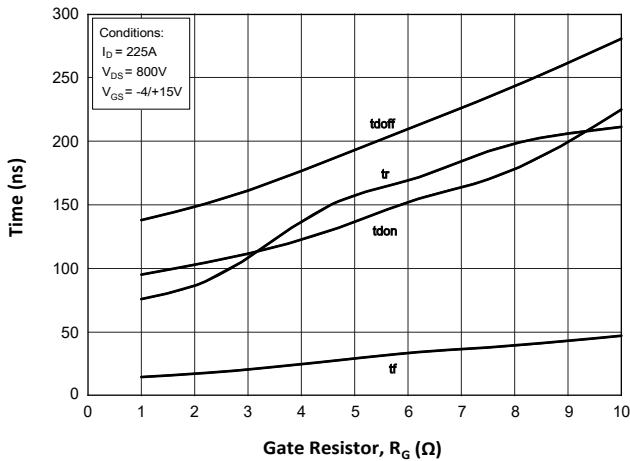


Fig.10 Switching Timer vs R_G Change $T_J=125^\circ\text{C}$

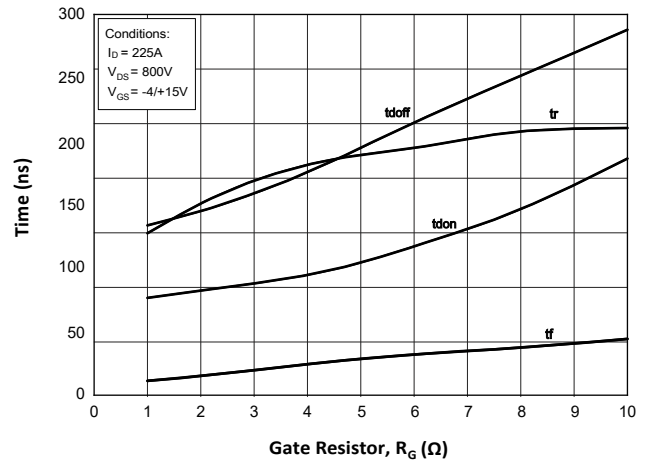


Fig.11 Clamped Inductive Switching Energy vs. Drain Current $T_J=25^\circ\text{C}$

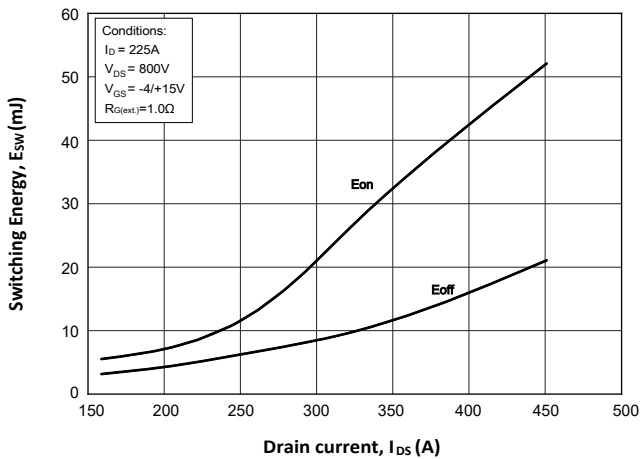
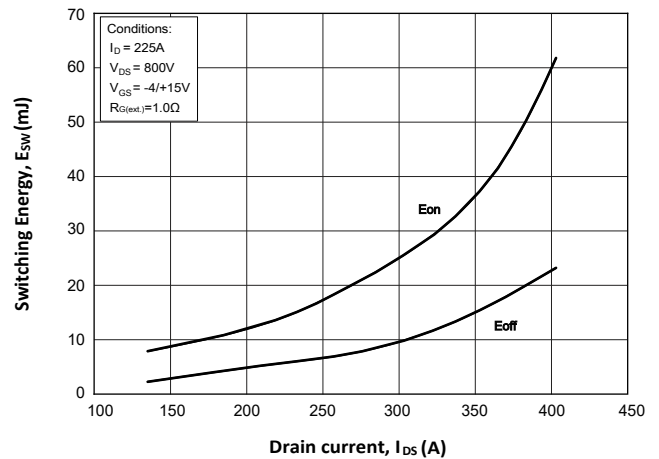


Fig.12 Clamped Inductive Switching Energy vs. Drain Current $T_J=125^\circ\text{C}$



Typical Characteristics

Fig.13 Body Diode curves $T_J = 25^\circ\text{C}$

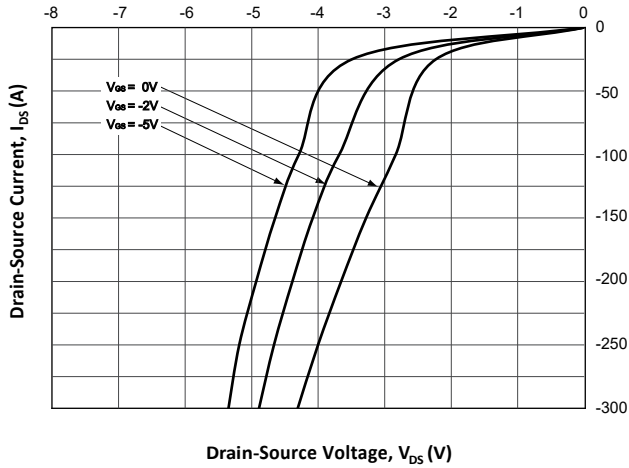


Fig.14 Body Diode curves $T_J = 125^\circ\text{C}$

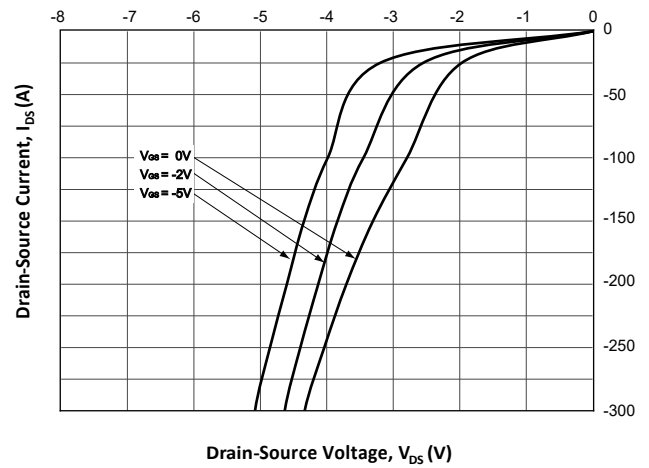


Fig.15 Continuous Drain Current (MOSFET) vs. Case Temperature

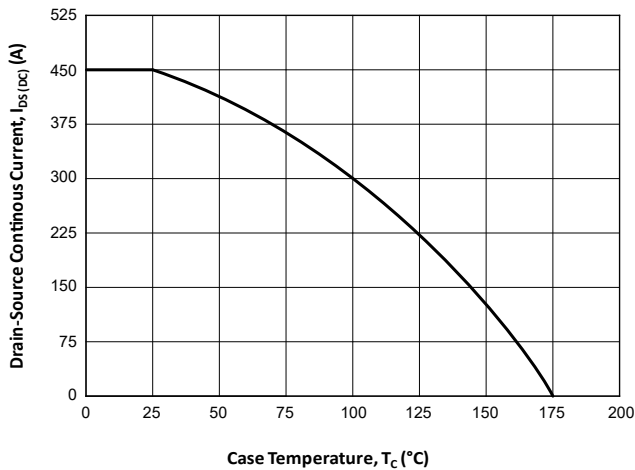
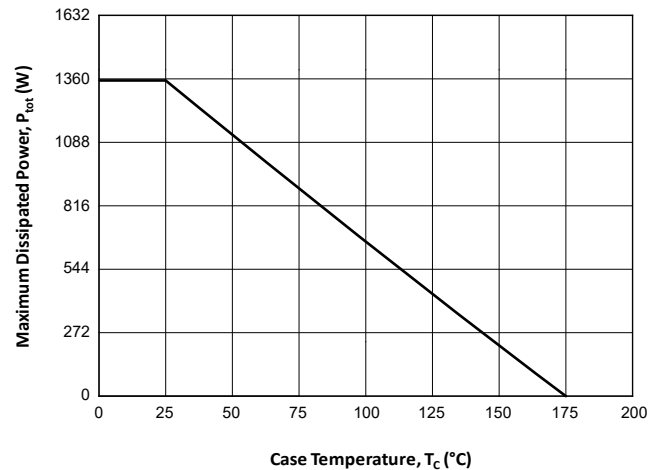


Fig.16 Max. Power Dissipation (MOSFET) Derating vs. Case Temperature



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