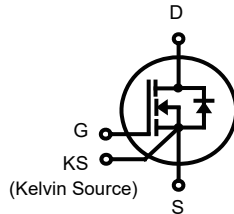


Silicon Carbide Enhancement Mode MOSFET

Features

- ◆ $V_{DSS} = 1200V$
- ◆ $R_{DS(ON)}$ Tpy. $10\ m\Omega @ V_{GS} = 18V$
- ◆ Fully Avalanche Rated
- ◆ Pb Free & RoHS Compliant
- ◆ Isolation Type Package
- ◆ Electrically Isolation base plate



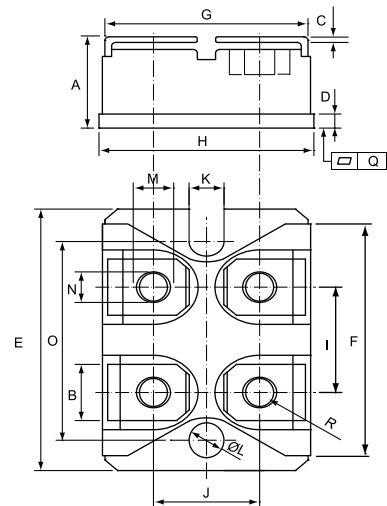
Preliminary



Dimensions in inches and (millimeters)

Applications

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



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

Parameter	Symbol	Rated	Unit
Drain-Source Voltage	V_{DS}	1200	V
Gate-Source Voltage	V_{GS}	-5/+18	V
Drain Current-Continuous	I_D	240 180	A
	@ $T_c = 25^\circ C$ @ $T_c = 100^\circ C$		
Drain Current-Pulsed	I_{DM}	500	A
	@ $T_c = 25^\circ C$		
Maximum Power Dissipation	P_D	930	W
Storage Temperature Range	T_{STG}	-55 to +175	$^\circ C$
Operating Junction Temperature Range	T_{VJ}	-55 to +175	$^\circ C$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.16	$^\circ C/W$
Isolation Voltage (A.C. 1 minute) between All Terminals and Baseplate	V_{iso}	2500	V
Mounting torque (M4 Screw)	To heatsink To terminals	1.3 1.1	$N\ m$

	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}	$V_{GS} = 18V$, $V_{DS} = 0V$	-	-	500	nA	
ON Characteristics							
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_{DS} = 8mA$	2.0	2.5	4.5	V	
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 18V$, $I_{DS} = 120A$	-	10	11	$m\Omega$	
Internal Gate Resistance	$R_{G(int)}$		-	2.2	-	Ω	
Dynamic Characteristics							
Input Capacitance	C_{iss}	$V_{DS} = 800V$ $V_{GS} = 0V$	-	15.131	-	nF	
Output Capacitance	C_{oss}	$V_{AC} = 1V$	-	544	-	pF	
Reverse Transfer Capacitance	C_{rss}	Freq.=1MHz	-	72	-		
Total Gate Charge	Q_g	$V_{DS} = 800V$ $V_{GS} = -5/+18V$ $I_{DS} = 120A$	-	737	-	nC	
Gate to Source Charge	Q_{gs}		-	209	-		
Gate to Drain Charge	Q_{gd}		-	232	-		
Switching Characteristics							
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 800V$ $V_{GS} = -5/+18V$ $I_{DS} = 120A$ $R_G = 1.0\Omega$	$T_{VJ} = 25^{\circ}\text{C}$	-	82	-	ns
			$T_{VJ} = 125^{\circ}\text{C}$	-	78	-	
Rise Time	t_r		$T_{VJ} = 25^{\circ}\text{C}$	-	81	-	
			$T_{VJ} = 125^{\circ}\text{C}$	-	74	-	
Turn-Off Delay Time	$t_{d(off)}$		$T_{VJ} = 25^{\circ}\text{C}$	-	142	-	
			$T_{VJ} = 125^{\circ}\text{C}$	-	149	-	
Fall Time	t_f		$T_{VJ} = 25^{\circ}\text{C}$	-	30	-	
			$T_{VJ} = 125^{\circ}\text{C}$	-	25	-	
Turn-On Switching Energy	E_{on}	$V_{DD} = 800V$ $V_{GS} = -5V/+18V$ $I_D = 120A$ $R_{G(ext)} = 1.0\Omega$	$T_{VJ} = 25^{\circ}\text{C}$	-	5.17	-	mJ
		$T_{VJ} = 125^{\circ}\text{C}$	-	5.85	-		
Turn-Off Switching Energy	E_{off}	$T_{VJ} = 25^{\circ}\text{C}$	-	5.71	-		
		$T_{VJ} = 125^{\circ}\text{C}$	-	5.28	-		
Body Diode Characteristics , at $T_J = 25^{\circ}\text{C}$							
Continuous Diode Forward Current	I_S	$V_{GS} = 0V$	-	120	-	A	
Diode Forward Voltage	V_{SD}	$I_{SD} = 100A$, $V_{GS} = 0V$	-	5.2	-	V	
MOSFET Forward Recovery Charge	Q_{rr}	$V_{DD} = 800V$, $I_{SD} = 120A$ $V_{GS} = 0V$, $di/dt = 3048A/\mu s$	-	1093	-	nC	
MOSFET Peak Forward Recovery Current	I_{rm}	$V_{DD} = 800V$, $I_{SD} = 120A$ $V_{GS} = 0V$, $di/dt = 3048A/\mu s$	-	46	-	A	
MOSFET Reverse Recovery Time	T_{rr}	$V_{DD} = 800V$, $I_{SD} = 120A$ $V_{GS} = 0V$, $di/dt = 3048A/\mu s$	-	38	-	ns	

Notes:

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

Typical Characteristics

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

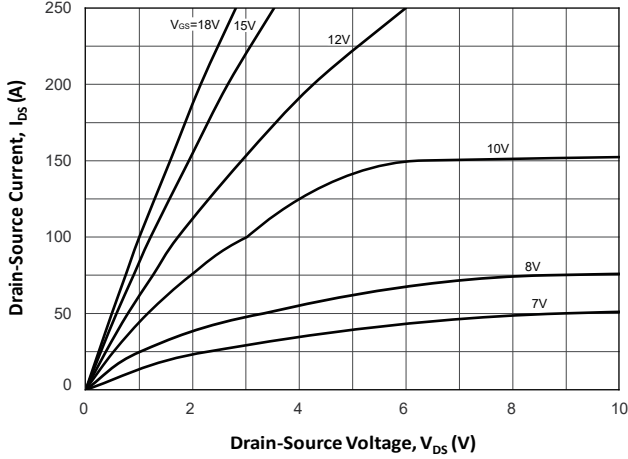


Fig.2 Output Characteristics at $T_J = 125^\circ\text{C}$

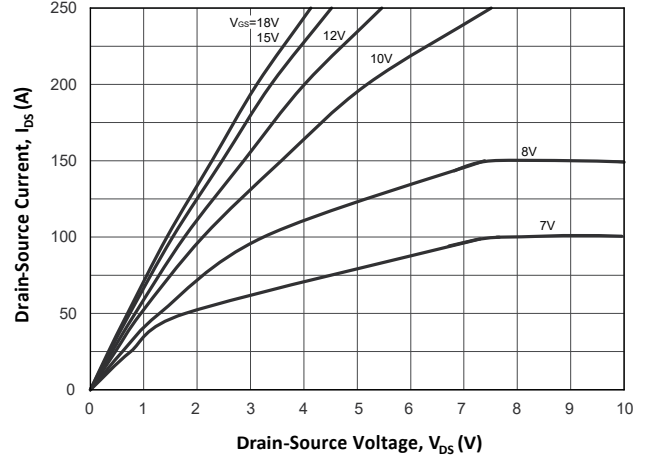


Fig.3 Drain Source on Resistance

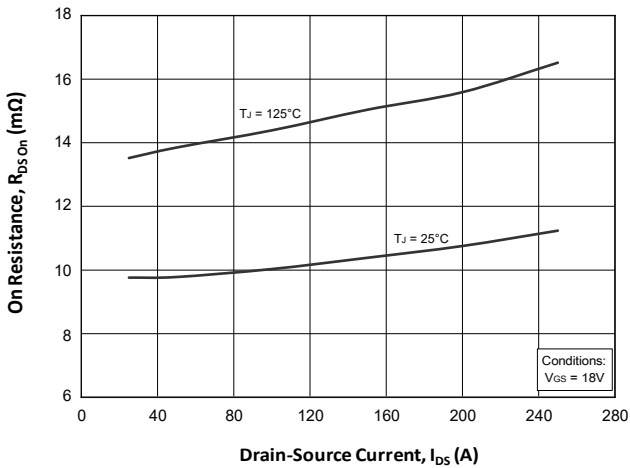


Fig.4 Transfer Characteristics

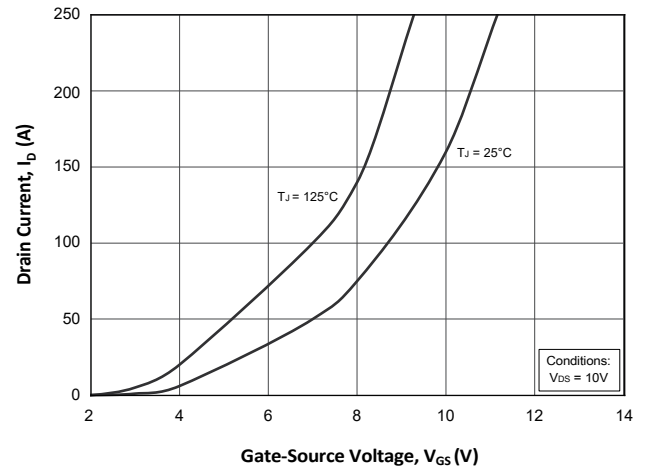


Fig.5 Capacitances vs. Drain-Source Voltage

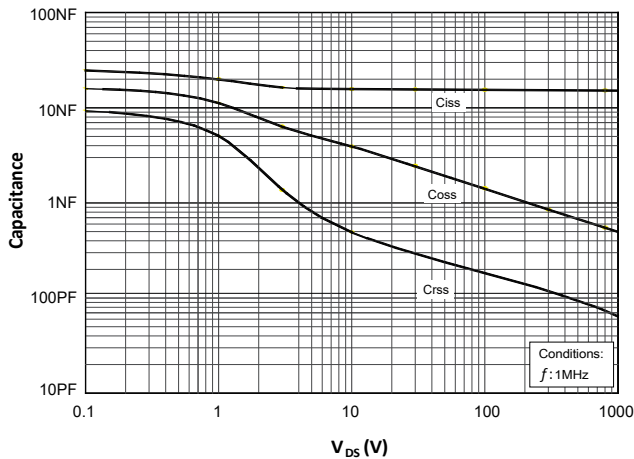
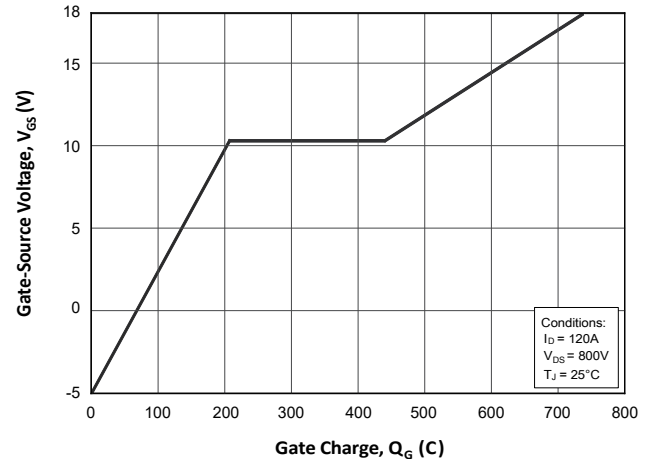


Fig.6 Gate Charge Characteristics



Typical Characteristics

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

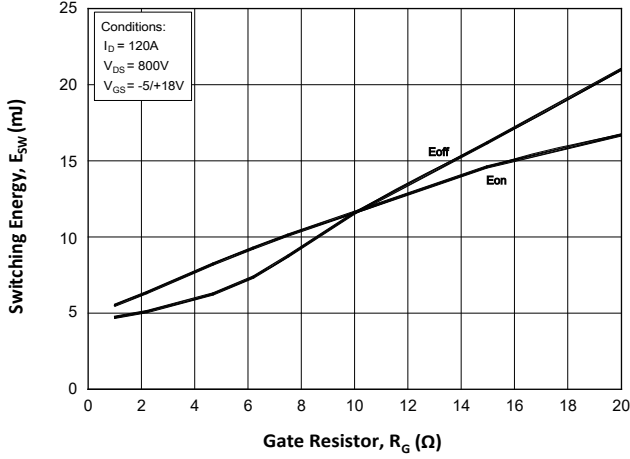


Fig.8 Switching losses vs R_G change $T_J=125^\circ\text{C}$

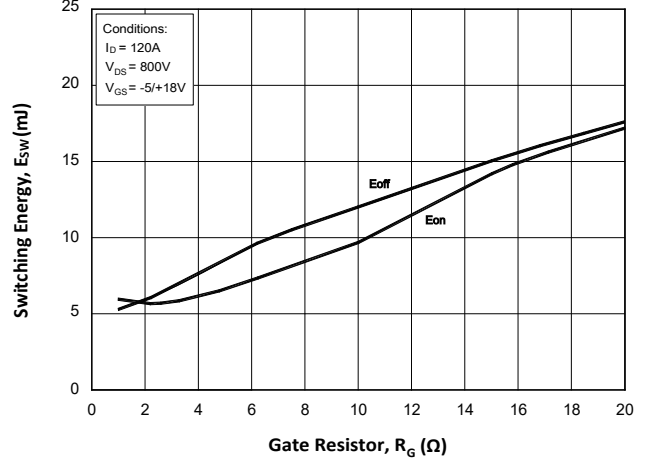


Fig.9 Switching Timer vs R_G Change $T_J=25^\circ\text{C}$

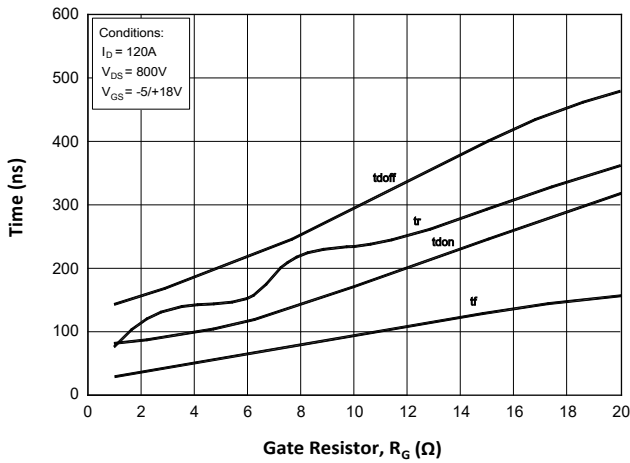


Fig.10 Switching Timer vs R_G Change $T_J=125^\circ\text{C}$

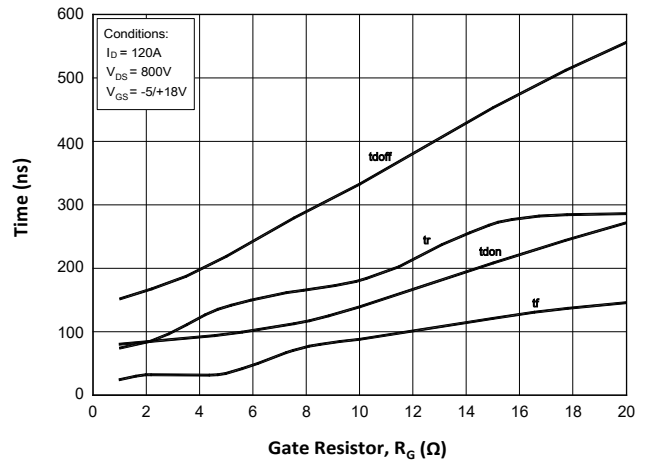


Fig.11 Clamped Inductive Switching Energy vs. Drain Current $T_J=25^\circ\text{C}$

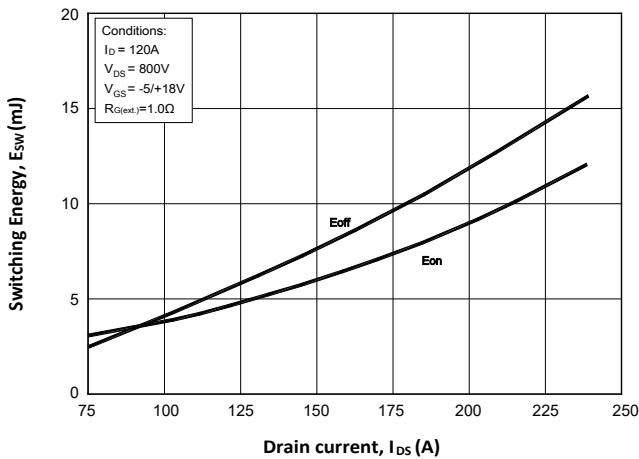
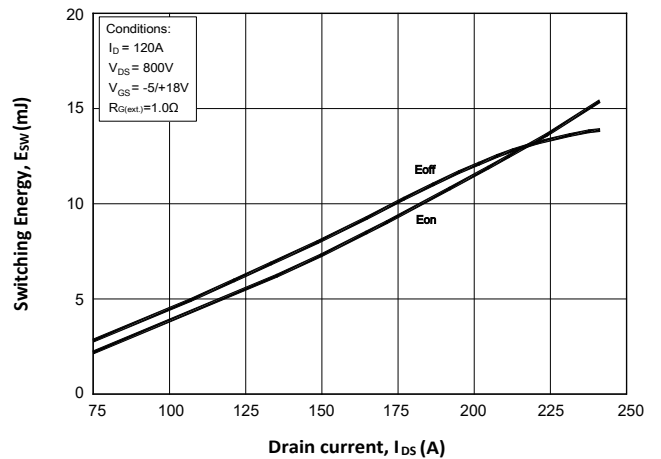


Fig.12 Clamped Inductive Switching Energy vs. Drain Current $T_J=125^\circ\text{C}$



Typical Characteristics

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

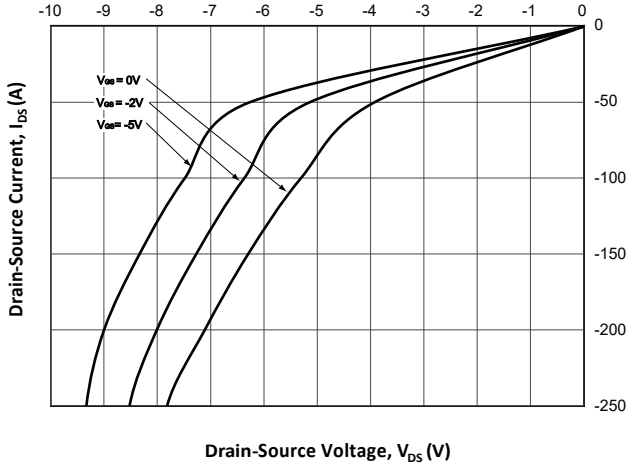


Fig.14 Body Diode curves $T_J = 125^\circ\text{C}$

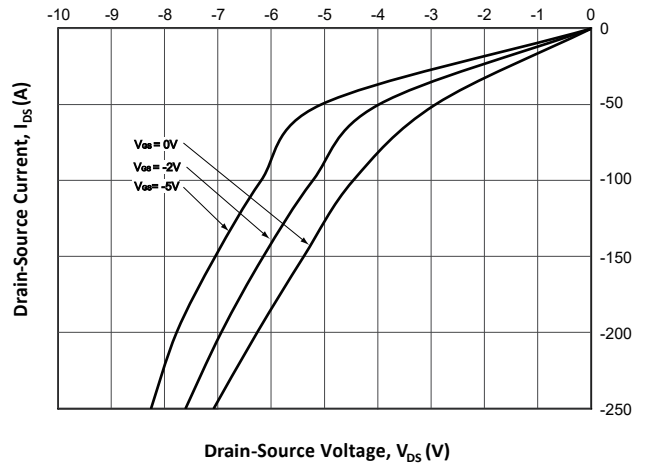


Fig.15 Continuous Drain Current (MOSFET) vs. Case Temperature

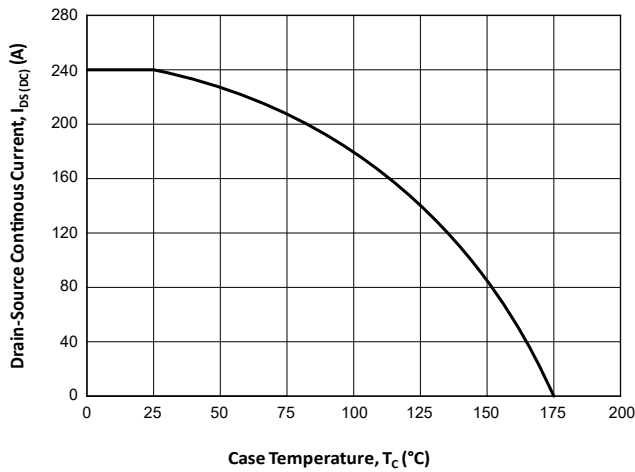
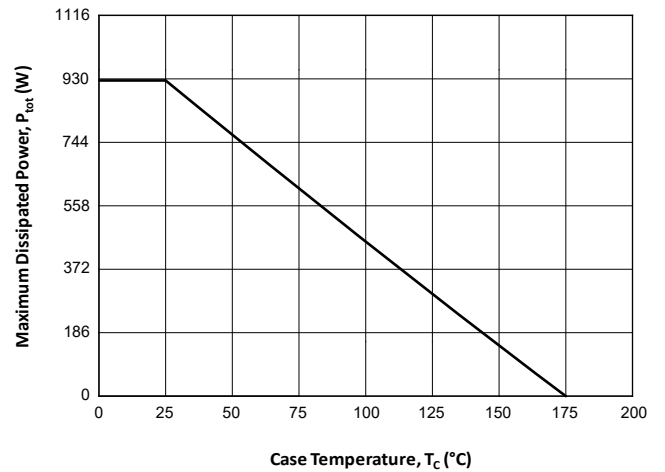


Fig.16 Max. Power Dissipation (MOSFET) Derating vs. Case Temperature



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