

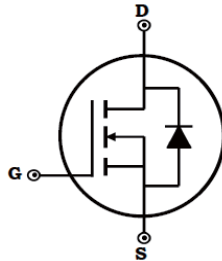


**N-Channel Enhancement Mode  
Power MOSFET 900V / 56A**

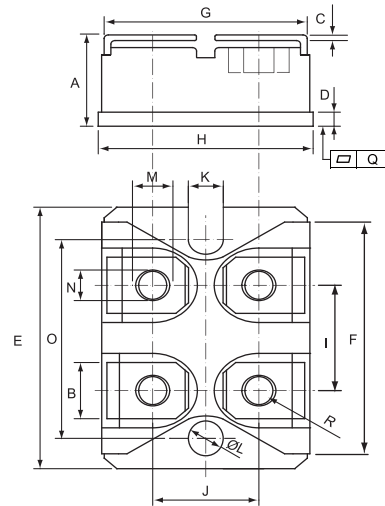
**Features**

- ◆  $V_{DS} = 900V$
- ◆  $R_{DS(ON)} < 146m\Omega @ V_{GS} = 10 V$
- ◆  $T_{RR} < 90ns$
- ◆ Fully Avalanche Rated
- ◆ Pb Free & RoHS Compliant
- ◆ Isolation Type Package
- ◆ Electrically Isolation Base Plate

Preliminary



Dimensions in inches and (millimeters)



**Applications**

- ◆ Switch-Mode and Resonant-Mode Power Supplies
- ◆ Robotics and Servo Controls
- ◆ AC and DC Motor Drives
- ◆ Laser Drivers
- ◆ DC-DC Converters

**Absolute Maximum Ratings (Tc=25°C unless otherwise noted)**

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DS}$	900	V
Gate-Source Voltage	$V_{GS}$	±30	V
Drain Current-Continuous @ $T_c = 25^\circ C$ @ $T_c = 100^\circ C$	$I_D$	56 32	A
Drain Current-Pulsed @ $T_c = 25^\circ C$	$I_{DM}$	168	A
Maximum Power Dissipation	$P_D$	1000	W
Storage Temperature Range	$T_{STG}$	-50 to +150	°C
Operating Junction Temperature Range	$T_J$	-50 to +150	°C
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.125	°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	$M_d$	1.3 1.1	Nm

	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<sub>J</sub> = 25°C (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>OFF Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V , I <sub>DS</sub> =3mA	900	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>GS</sub> =0V , V <sub>DS</sub> =900V	-	-	50	μA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±30V , V <sub>DS</sub> =0V	-	-	±200	nA
<b>ON Characteristics</b>						
Gate Threshold Voltage	V <sub>TH</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =1mA	3.5	-	6.5	V
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V , I <sub>DS</sub> =28A	-	-	146	mΩ
Gate Resistance	R <sub>G</sub>		-	1	-	Ω
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =30V , I <sub>D</sub> =28A	-	56	-	S
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V	-	21	-	nF
Output Capacitance	C <sub>oss</sub>	V <sub>GS</sub> =0V	-	1194	-	pF
Reverse Transfer Capacitance	C <sub>rss</sub>	Freq.=1MHz	-	105	-	
<b>Switching Characteristics</b>						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DS</sub> =450V	-	129.4	-	ns
Rise Time	t <sub>r</sub>	V <sub>GS</sub> =10V	-	11.2	-	
Turn-Off Delay Time	t <sub>d(off)</sub>	I <sub>DS</sub> =28A	-	136.8	-	
Fall Time	t <sub>f</sub>	R <sub>G</sub> =1Ω	-	16.2	-	
Total Gate Charge at 10V	Q <sub>g</sub>	V <sub>DS</sub> =450V	-	148	-	nC
Gate to Source Charge	Q <sub>gs</sub>	V <sub>GS</sub> =10V	-	57	-	
Gate to Drain Charge	Q <sub>gd</sub>	I <sub>DS</sub> =28A	-	49	-	
<b>Reverse Diode Characteristics</b>						
Drain-Source Diode Forward Voltage	V <sub>F</sub>	T <sub>J</sub> =25°C , I <sub>F</sub> =56A <sup>Note1</sup>	-	-	2.5	V
Diode Continuous Forward Current	I <sub>F</sub>		-	-	56	A
Diode Pulsed Current	I <sub>F,pulse</sub>		-	-	225	A
Reverse Recovery time	T <sub>rr</sub>		-	-	90	ns
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =29A , V <sub>R</sub> =100V , -di/dt=111A/us	-	264	-	nC
Peak Reverse Recovery Current	I <sub>RM</sub>		-	5.4	-	A

Note:

1. Pulse Test: t ≤ 300 μs, Duty Cycle , d ≤ 2%.



Typical Characteristics

Fig. 1. Maximum Drain Current vs. Case Temperature

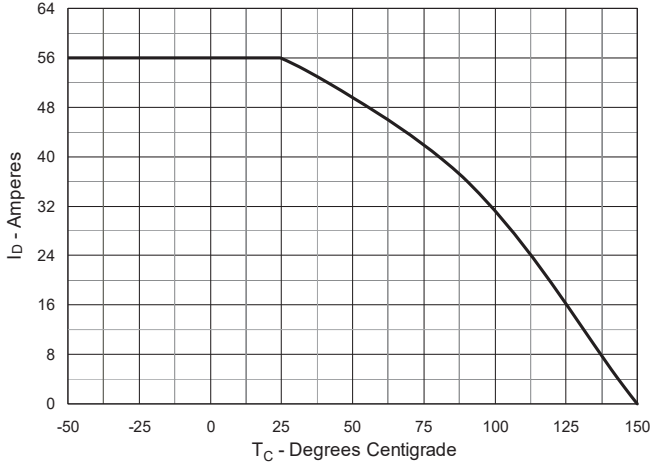


Fig. 2. Extended Output Characteristics @  $T_J = 25^\circ\text{C}$

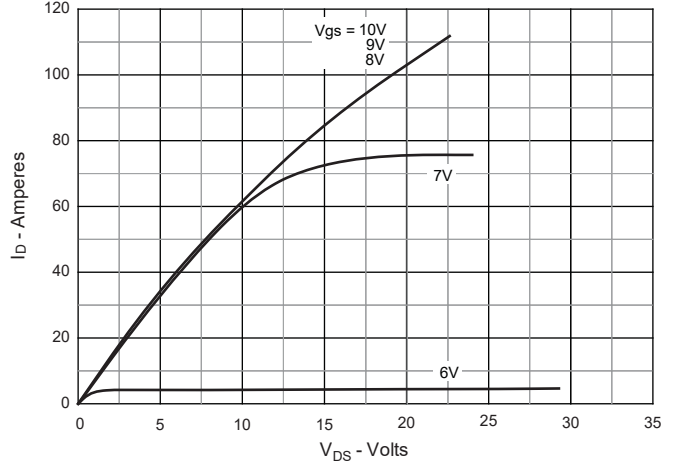


Fig. 3. Output Characteristics @  $T_J = 125^\circ\text{C}$

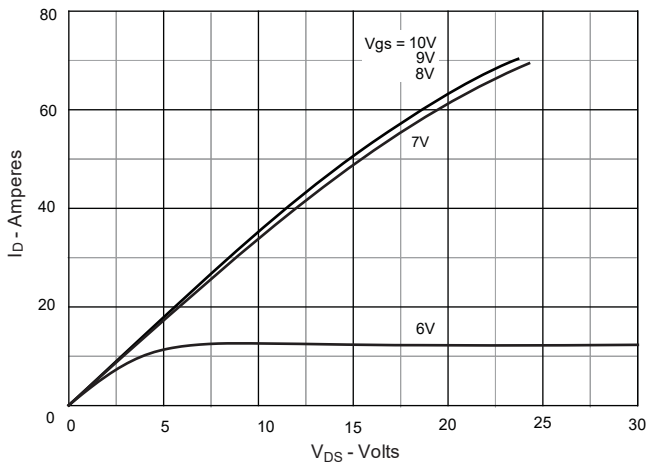


Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 28\text{A}$  Value vs. Drain Current

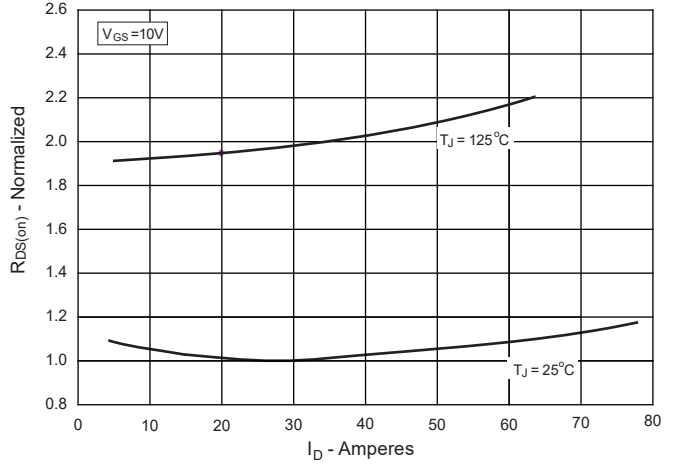


Fig. 5. Input Admittance

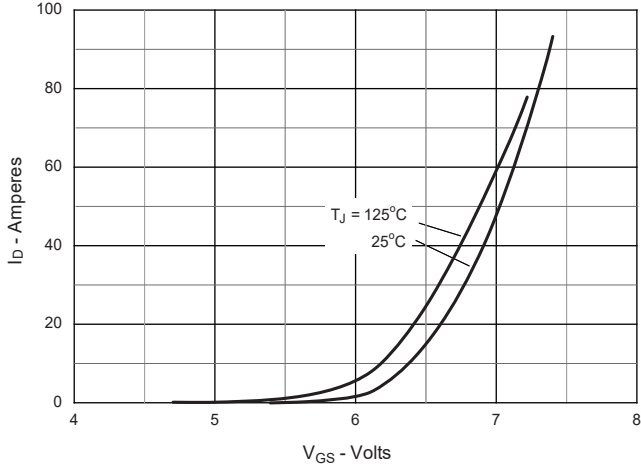
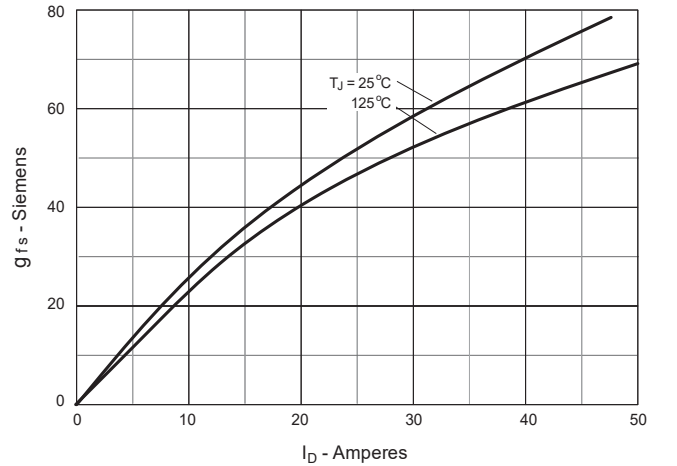


Fig. 6. Transconductance





Typical Characteristics

Fig. 7. Forward Voltage Drop of Intrinsic Diode

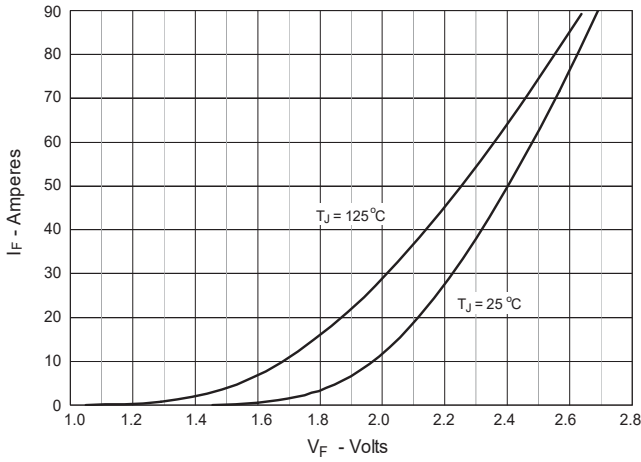


Fig. 8. Gate Charge

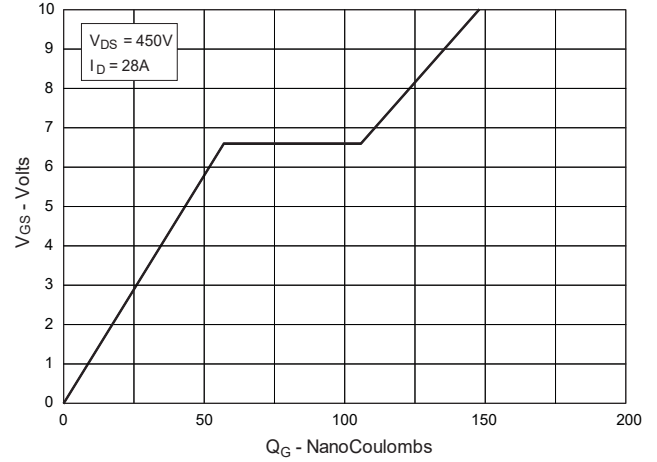


Fig. 9. Capacitance

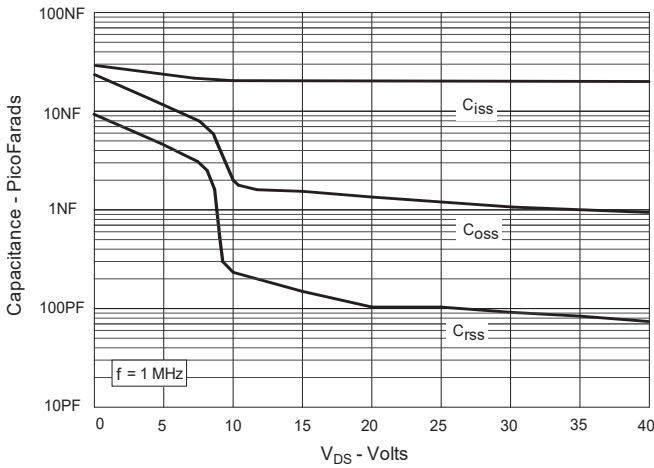


Fig. 10. Forward derating curve of reverse diode

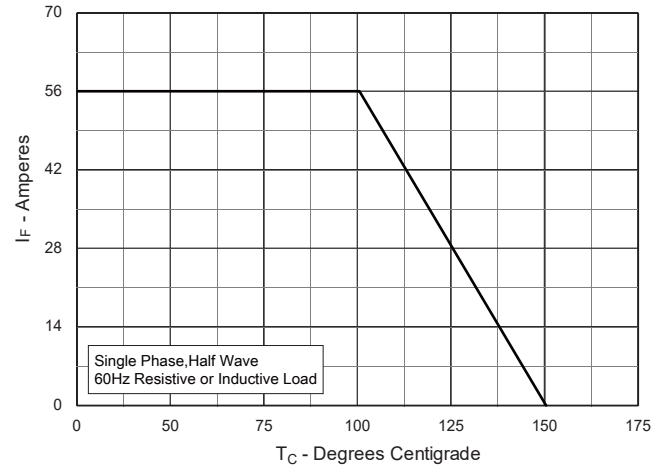


Fig 11. Peak forward surge current of reverse diode

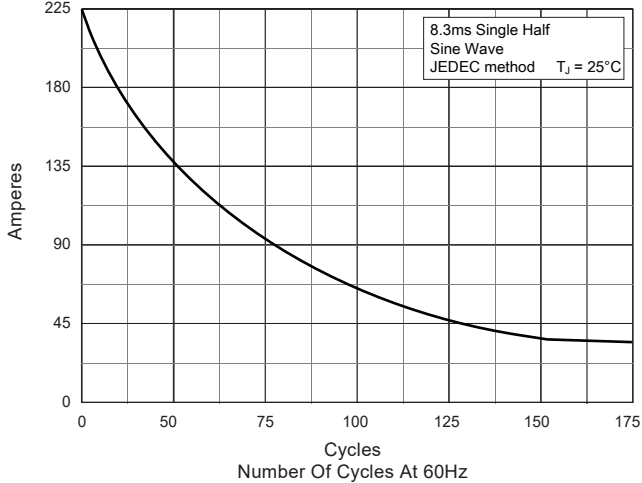
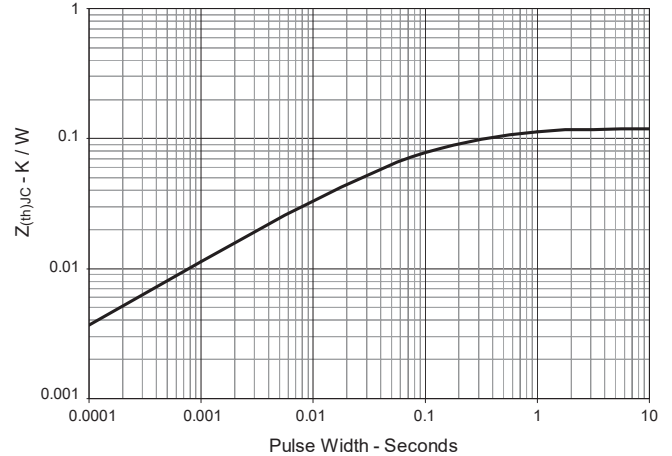


Fig 12. Maximum Transient Thermal Impedance





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