



**N-Channel Enhancement Mode
Power MOSFET 1200V / 40A**

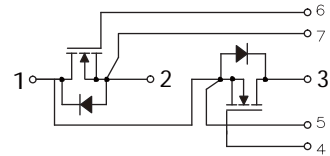
Preliminary

Features

- ◆ $V_{DS} = 1200V$
- ◆ $R_{DS(ON)} < 322m\Omega @ V_{GS} = 10V$
- ◆ $T_{RR} < 90ns$
- ◆ Fully Avalanche Rated
- ◆ Pb Free & RoHS Compliant
- ◆ Isolation Type Package
- ◆ Electrically Isolation Base Plate

Applications

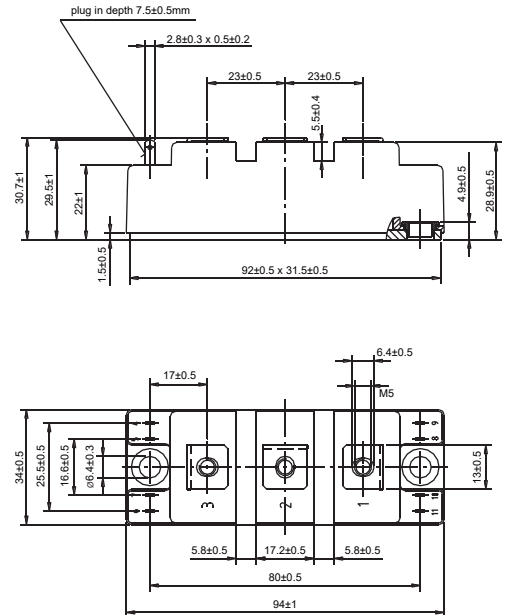
- ◆ Switch-Mode and Resonant-Mode Power Supplies
- ◆ Robotics and Servo Controls
- ◆ AC and DC Motor Drives
- ◆ Laser Drivers
- ◆ DC-DC Converters



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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	1200	V
Gate-Source Voltage	V_{GS}	±30	V
Drain Current-Continuous @ Tc =25°C @ Tc =100°C	I_D	40 24	A
Drain Current-Pulsed @ Tc =25°C	I_{DM}	100	A
Maximum Power Dissipation	P_D	1000	W
Avalanche Energy, Single Pulse	E_{AS}	420	mJ
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 (M5 Screw)	M_d	3-5	Nm

Package Outlines



Dimensions in mm (1 mm = 0.0394")



Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
OFF Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _{DS} =3mA	1200	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} =0V, V _{DS} =1200V	-	-	50	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±30V, V _{DS} =0V	-	-	±300	nA
ON Characteristics						
Gate Threshold Voltage	V _{TH}	V _{DS} =V _{GS} , I _{DS} =1mA	3.5	-	6.5	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _{DS} =20A	-	-	322	mΩ
Gate Resistance	R _G		-	20	-	Ω
Forward Transconductance	g _{fs}	V _{DS} =20V, I _D =20A	-	56	-	S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =25V	-	19	-	nF
Output Capacitance	C _{oss}	V _{GS} =0V	-	1390	-	pF
Reverse Transfer Capacitance	C _{rss}	Freq.=1MHz	-	262	-	
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	V _{DS} =600V	-	123	-	ns
Rise Time	t _r	V _{GS} =10V	-	44	-	
Turn-Off Delay Time	t _{d(off)}	I _{DS} =21A	-	155	-	
Fall Time	t _f	R _G =1Ω	-	22	-	
Total Gate Charge at 10V	Q _g	V _{DS} =600V	-	372	-	nC
Gate to Source Charge	Q _{gs}	V _{GS} =10V I _{DS} =20A	-	111	-	
Gate to Drain Charge	Q _{gd}	R _G =1Ω	-	147	-	
Reverse Diode Characteristics						
Drain-Source Diode Forward Voltage	V _F	T _J =25°C, I _F =40A	-	-	2.5	V
Diode Continuous Forward Current	I _F		-	-	40	A
Diode Pulsed Current ^{Note1}	I _{F,pulse}		-	-	130	A
Reverse Recovery time	T _{RR}	I _F =20A, V _R =100V, -di/dt=100A/us	-	-	90	ns
Reverse Recovery Charge	Q _{rr}		-	-	195	nC
Peak Reverse Recovery Current	I _{RM}		-	-	4.1	A

Notes:

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



Typical Characteristics

Fig. 1. Maximum Drain Current vs. Case Temperature

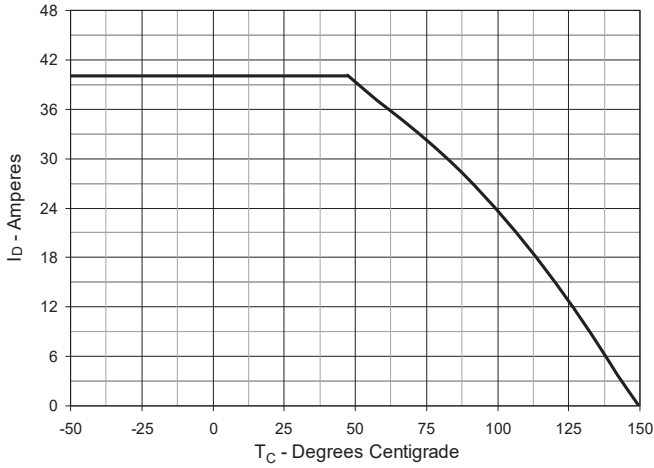


Fig. 2. Output Characteristics @ $T_J = 25^\circ\text{C}$

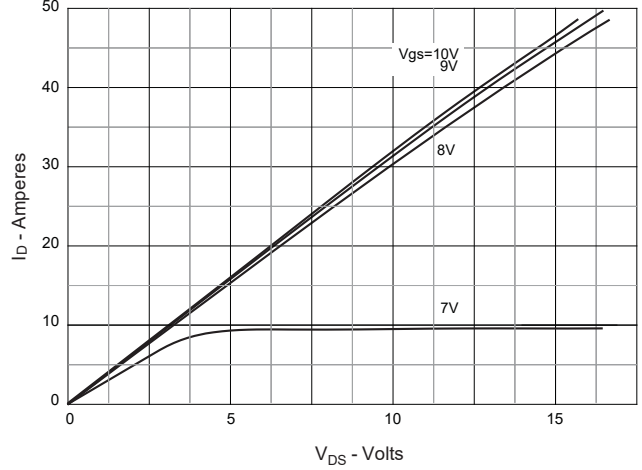


Fig. 3. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

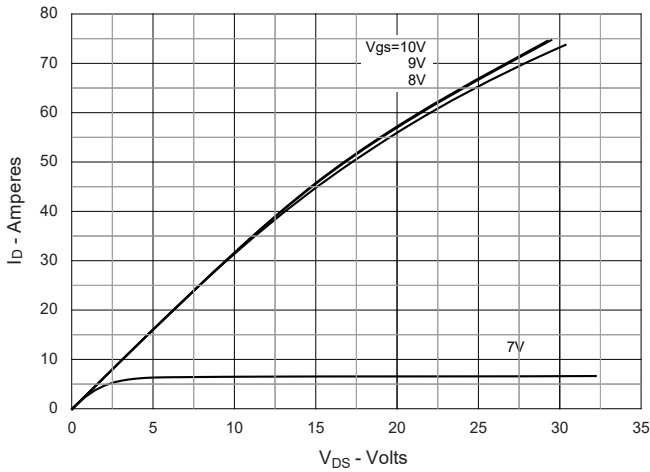


Fig. 4. Output Characteristics @ $T_J = 125^\circ\text{C}$

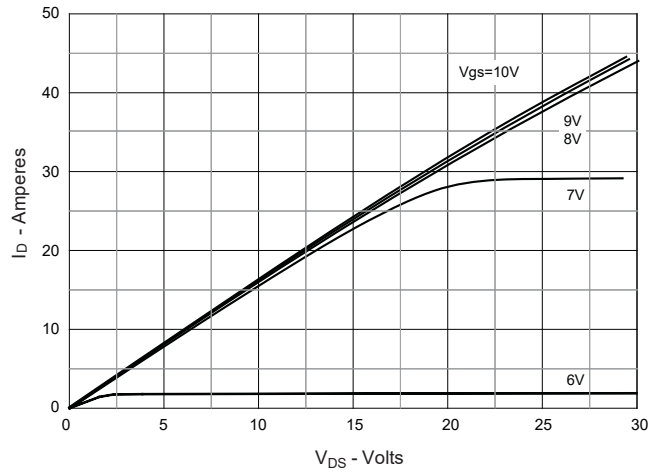


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 20\text{A}$ Value vs. Drain Current

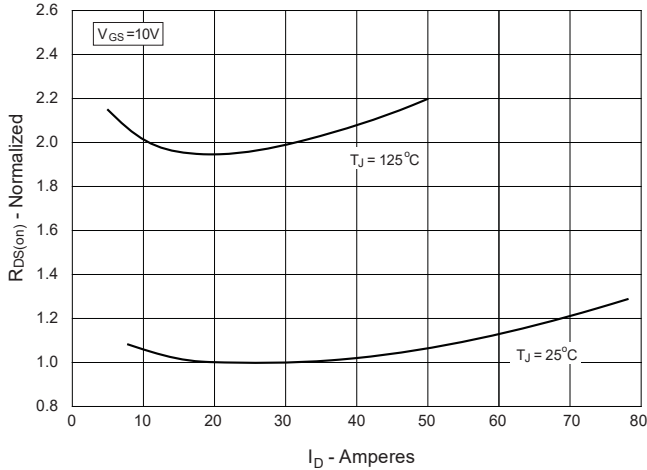
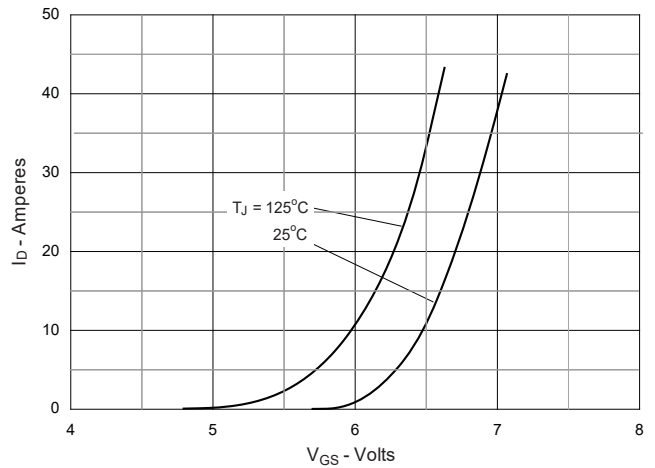


Fig. 6. Input Admittance





Typical Characteristics

Fig. 7. Transconductance

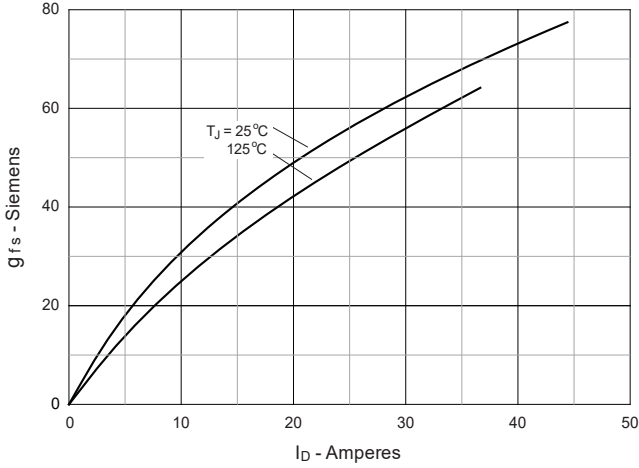


Fig. 8. Gate Charge

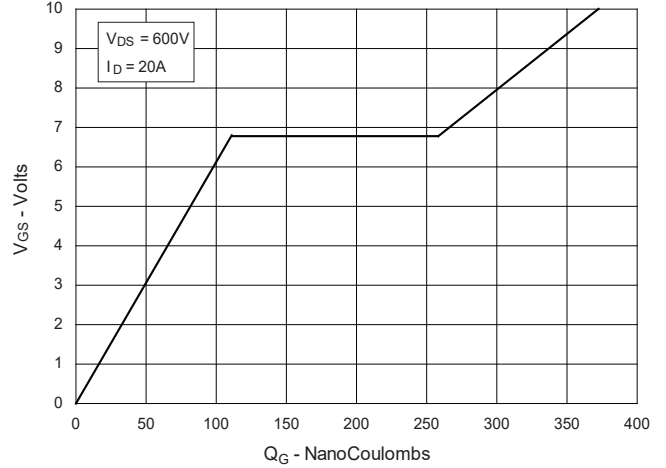


Fig. 9. Forward Voltage Drop of Intrinsic Diode

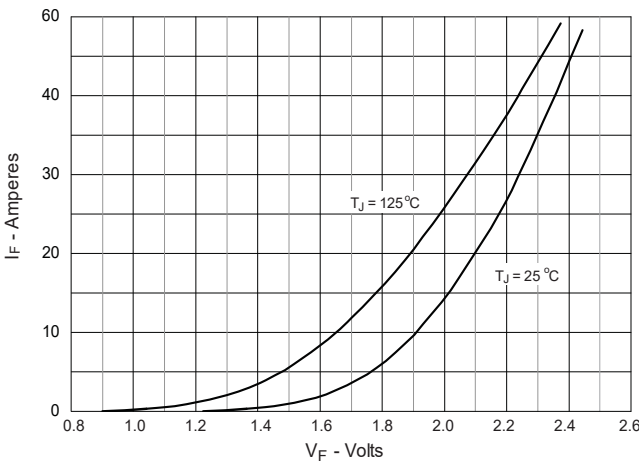


Fig. 10. Capacitance

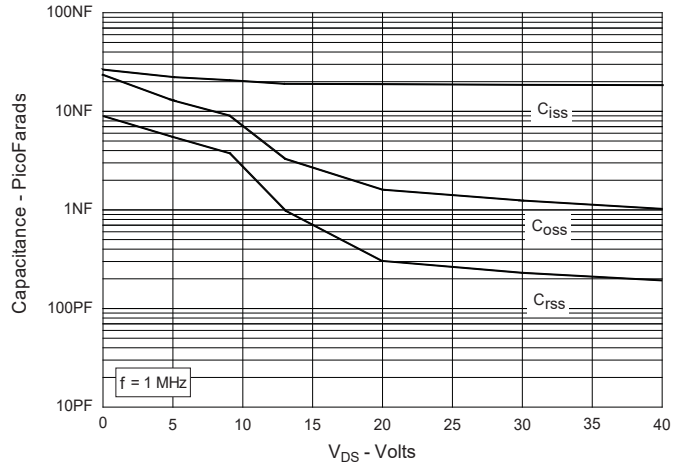


Fig 11. Forward derating curve of reverse diode

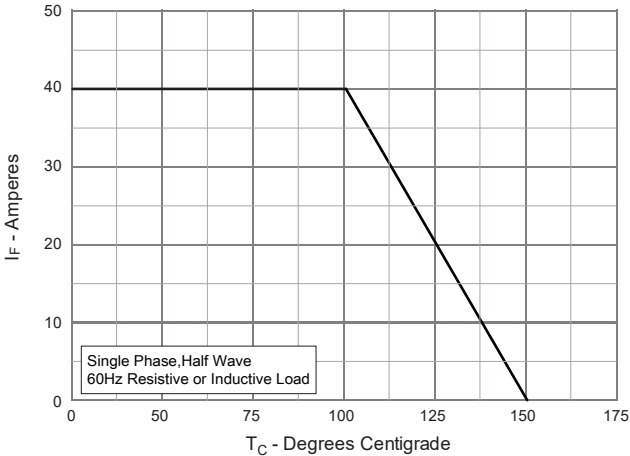
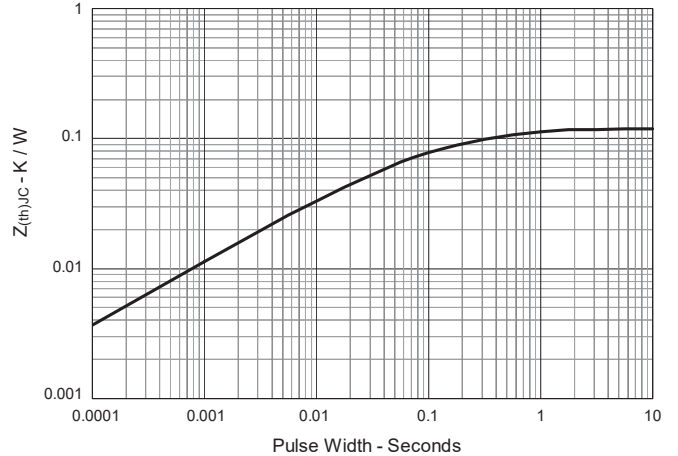


Fig 12. Maximum Transient Thermal Impedance





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