



N-Channel Enhancement Mode Power MOSFET 500V / 75A

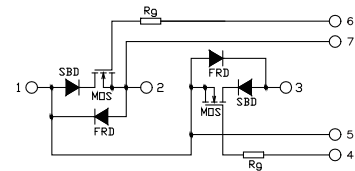
Preliminary

Features

- ◆ $V_{DSS} = 500V$
- ◆ $R_{DS(ON)}$ Typ.65mΩ@ $V_{GS} = 10 V$
- ◆ Fully Avalanche Rated
- ◆ Pb Free & RoHS Compliant
- ◆ Isolation Type Package
- ◆ Electrically Isolation base plate

Applications

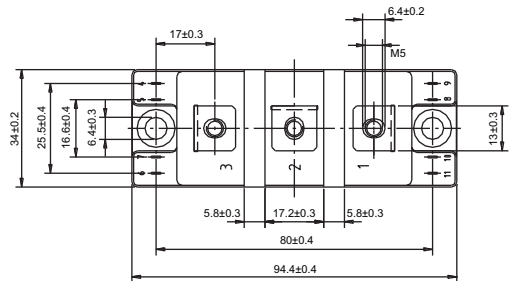
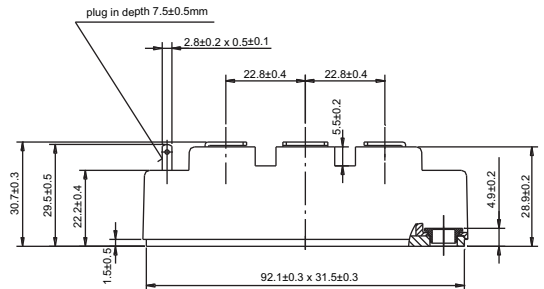
- ◆ Backlighting
- ◆ Power Converters
- ◆ Synchronous Rectifiers



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

Parameter	Symbol	Ratings	Unit	
Drain-Source Voltage	V_{DS}	500	V	
Gate-Source Voltage	V_{GS}	±20	V	
Drain Current-Continuous	I_D	Duty=50%	75	A
		D.C.	55	
Drain Current-Pulsed @ $T_c = 25^\circ C$ <small>Note1</small>	I_{DM}	150	A	
Maximum Power Dissipation	P_D	500	W	
Storage Temperature Range	T_{STG}	-50 to +125	°C	
Operating Junction Temperature Range	T_J	-50 to +150	°C	
Thermal Resistance, Junction-to-Case	MOSEET	$R\theta_{JC}$	0.25	°C/W
	Diode		2.00	
Isolation Voltage (A.C. 1 minute)	V_{iso}	2500	V	
Mounting torque (M5 Screw)	M_d	3-5	Nm	
Weight		142	g	

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	500	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} =0V, V _{DS} =500V	-	-	1	mA
Gate-Body Leakage	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	10	μA
ON Characteristics						
Gate Threshold Voltage	V _{TH}	V _{DS} =V _{GS} , I _{DS} =5mA	2	2.9	4	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _{DS} =35A	-	65	75	mΩ
Forward Transconductance	g _{fs}	V _{DS} =15V, I _{DS} =35A	-	75	-	S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =25V	-	12	-	nF
Output Capacitance	C _{oss}	V _{GS} =0V	-	0.7	-	
Reverse Transfer Capacitance	C _{rss}	Freq.=1MHz	-	0.5	-	
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	V _{Dd} =1/2V _{DSS} V _{GS} =-5V,+10V I _{DS} =35A R _G =2Ω	-	82	-	ns
Rise Time	t _r		-	120	-	
Turn-Off Delay Time	t _{d(off)}		-	330	-	
Fall Time	t _f		-	35	-	
Diode Forward Voltage	E _(on)		-	0.2	-	mJ
Diode Continuous Forward Current	E _(off)	-	2.9	-		

■ Reverse Diode Characteristics (T_J = 25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Peak Forward Voltage	V _F	I _F =75A, T _J =25°C	-	1.8	-	V
Diode Pulsed Current ^{Note1}	I _{F,pulse}		-	-	150	A
Peak Reverse Recovery Current	I _{RM}	I _F =75A -dis/dt=100A/μs	-	16	-	A
Recovered Charge	Q _{rr}	I _F =75A -dis/dt=100A/μs	-	0.53	-	μc
Reverse Recovery Energy	E _{rec}	I _F =75A -dis/dt=100A/μs	-	0.218	-	mJ
Reverse Recovery Time	T _{rr}	I _F =75A -dis/dt=100A/μs	-	53	-	ns

Notes:

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



Typical Characteristics

Fig. 1 Typical Output Characteristics

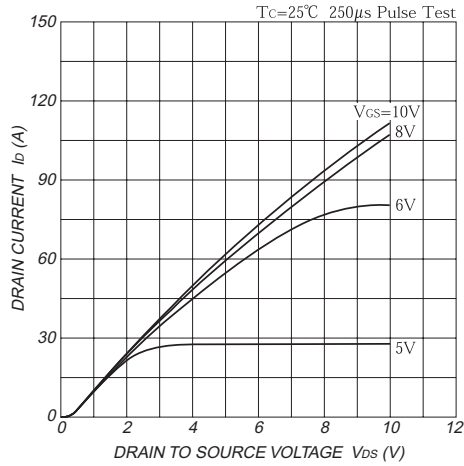


Fig. 2 Typical Drain-Source On-Voltage Vs. Gate-Source Voltage

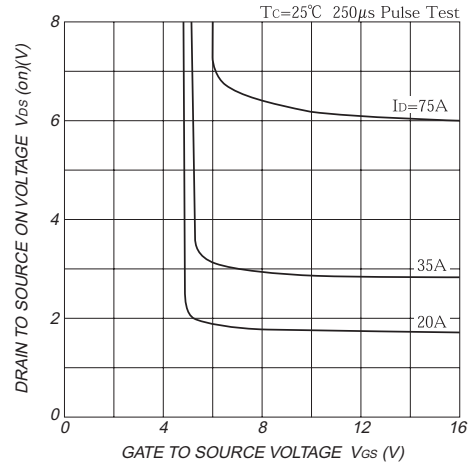


Fig. 3 Typical Drain-Source On Voltage Vs. Junction Temperature

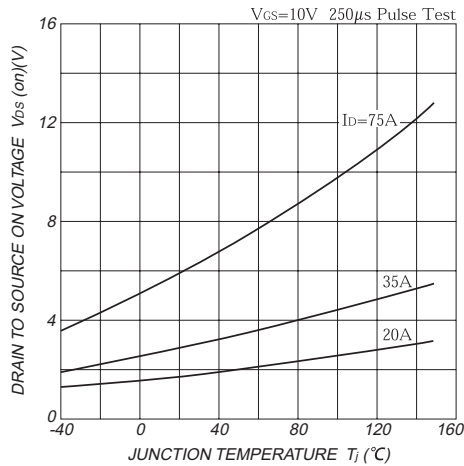


Fig. 4 Typical Capacitance Vs. Drain-Source Voltage

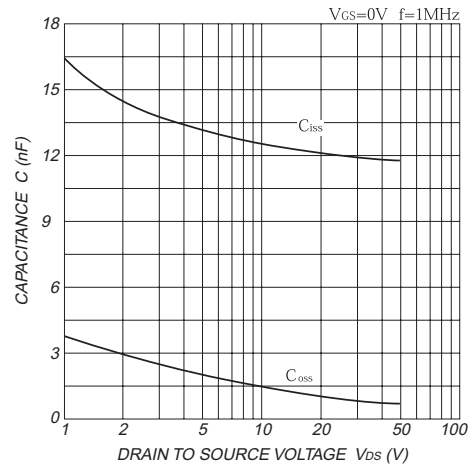


Fig. 5 Typical Gate Charge Vs. Gate-Source Voltage

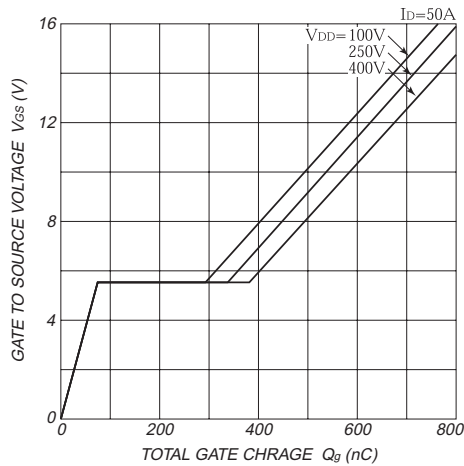
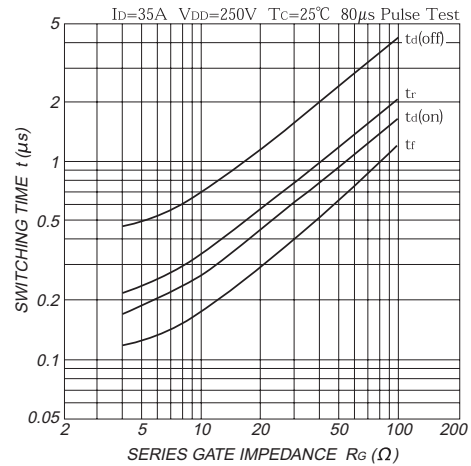


Fig. 6 Typical Switching Time Vs. Series Gate Impedance





Typical Characteristics

Fig. 7 Typical Switching Time Vs. Drain Current

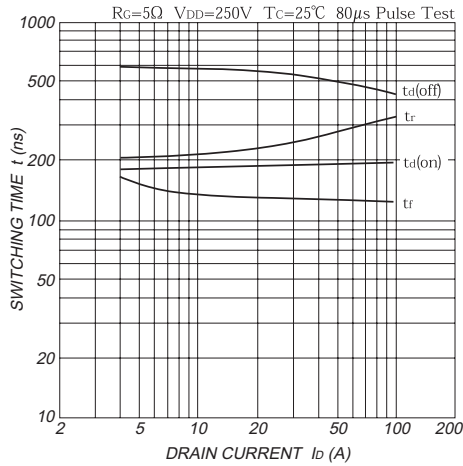


Fig. 8 Typical Source-Drain Diode Forward Characteristics

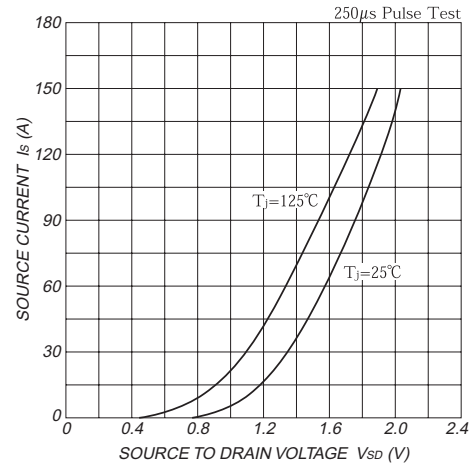


Fig. 9 Typical Reverse Recovery Characteristics

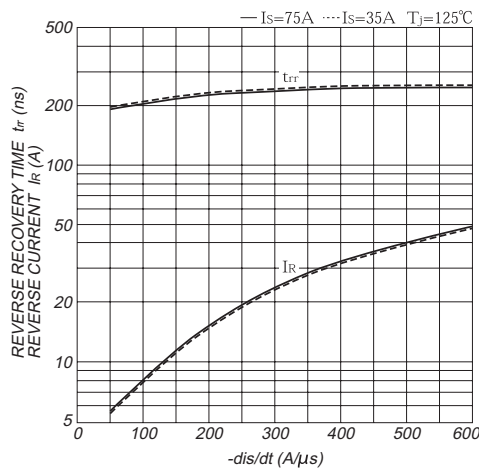


Fig. 10 Maximum Safe Operating Area

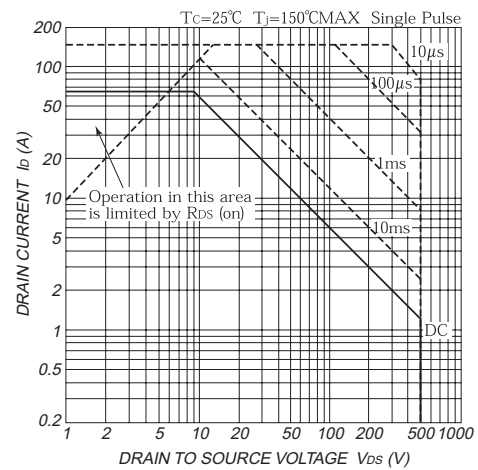


Fig. 11-1 Normalized Transient Thermal impedance(MOSFET)

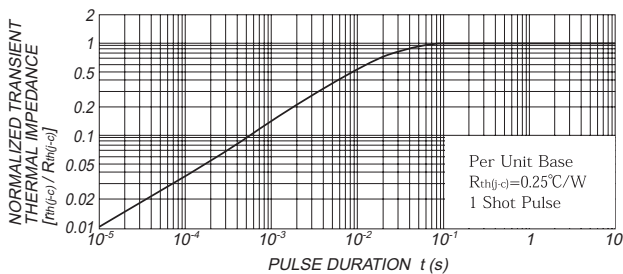
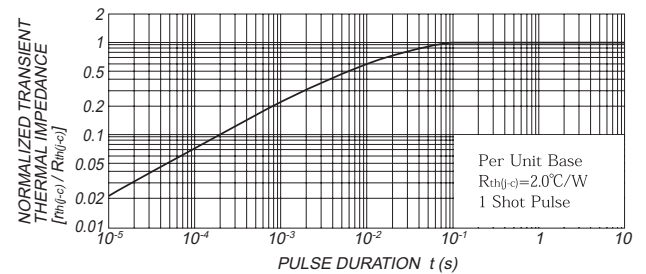


Fig. 11-2 Normalized Transient Thermal impedance(DIODE)





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