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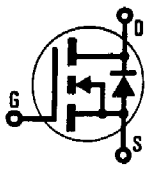
N-CHANNEL POWER MOSFETs



2N6788

Absolute Maximum Ratings

Parameter		2N6788	Units
V_{DS}	Drain - Source Voltage ①	100*	V
V_{DGR}	Drain - Gate Voltage (R_{GS} = 20 KΩ) ①	100*	V
I_D @ T_C = 25°C	Continuous Drain Current	6.0*	A
I_D @ T_C = 100°C	Continuous Drain Current	3.5*	A
I_{DM}	Pulsed Drain Current ③	24*	A
V_{GS}	Gate - Source Voltage	±20*	V
I_S	Continuous Source Current (Body Diode)	6.0*	A
I_{SM}	Pulse Source Current (Body Diode) ③	24*	A
P_D @ T_C = 25°C	Max. Power Dissipation	20* (See Fig. 14)	W
	Linear Derating Factor	0.16* (See Fig. 14)	W/K
I_{LM}	Inductive Current, Clamped	L = 100μH 24	A
T_J T_{stg}	Operating Junction and Storage Temperature Range	−55* to 150*	°C
	Lead Temperature	300* (0.063 in. (1.6mm) from case for 10s)	°C

Electrical Characteristics @ T_C = 25°C (Unless Otherwise Specified)

Parameter		Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain - Source Breakdown Voltage	100*	–	–	V	V_{GS} = 0V, I_D = 0.25 mA
$V_{GS(th)}$	Gate Threshold Voltage	2.0*	–	4.0*	V	V_{DS} = V_{GS}, I_D = 1.0 mA
I_{GSS}	Gate - Source Leakage Forward	–	–	100*	nA	V_{GS} = 20V, V_{DS} = 0V
I_{GSS}	Gate - Source Leakage Reverse	–	–	100*	nA	V_{GS} = −20V, V_{DS} = 0V
I_{DSS}	Zero Gate Voltage Drain Current	–	–	250*	μA	V_{DS} = 100V, V_{GS} = 0V
		–	–	1000*	μA	V_{DS} = 80V, V_{GS} = 0V, T_C = 125°C
$V_{DS(on)}$	On-State Voltage ②	–	–	2.10*	V	V_{GS} = 10V, I_D = 6.0A
$R_{DS(on)}$	Static Drain-Source On-State Resistance ②	–	0.25	0.30*	Ω	V_{GS} = 10V, I_D = 3.5A, T_A = 25°C
		–	–	0.54*	Ω	V_{GS} = 10V, I_D = 3.5A, T_A = 125°C
V_{SD}	Diode Forward Voltage ②	0.8*	–	1.8*	V	T_C = 25°C, I_S = 6.0A, V_{GS} = 0V
g_{fs}	Forward Transconductance ②	1.5*	2.9	4.5*	S(℧)	V_{DS} = 5V, I_D = 3.5A
C_{iss}	Input Capacitance	200*	450	600*	pF	V_{GS} = 0V, V_{DS} = 25V, f = 1.0 MHz
C_{oss}	Output Capacitance	100*	200	400*	pF	See Fig. 10
C_{rss}	Reverse Transfer Capacitance	20*	50	100*	pF	
$t_{d(on)}$	Turn-On Delay Time	–	–	40*	ns	V_{DD} ≅ 35V, I_D = 3.5A, Z_o = 50Ω
t_r	Rise Time	–	–	70*	ns	See Fig. 15
$t_{d(off)}$	Turn-Off Delay Time	–	–	40*	ns	(MOSFET switching times are essentially independent
t_f	Fall Time	–	–	70*	ns	of operating temperature.)
SOA	Safe Operating Area	20	–	–	W	V_{DS} = 80V, I_D = 250 mA, See Fig. 16.
		20	–	–	W	V_{DS} = 3.3V, I_D = 60A, See Fig. 16.

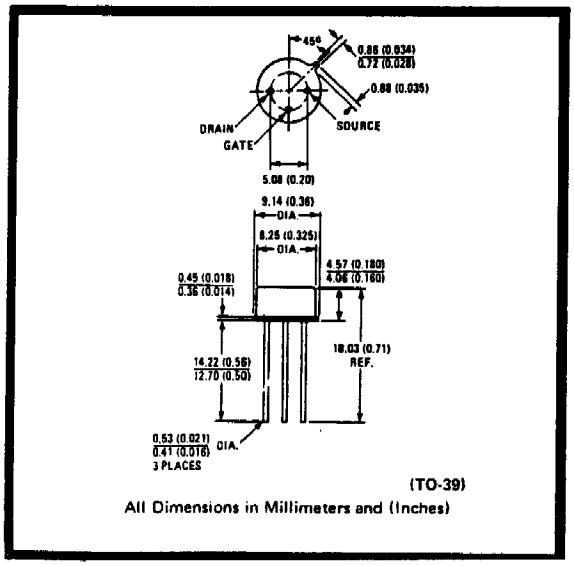
Thermal Resistance

R_{thJC}	Junction-to-Case	–	–	6.25*	K/W	
R_{thJA}	Junction-to-Ambient	–	–	175	K/W	Free Air Operation

Source-Drain Diode Switching Characteristics (Typical)

t_{rr}	Reverse Recovery Time	230	ns	T_J = 150°C, I_F = 6.0A, di_F/dt = 100A/μs
Q_{RR}	Reverse Recovered Charge	1.2	μC	T_J = 150°C, I_F = 6.0A, di_F/dt = 100A/μs
t_{on}	Forward Turn-on Time	Intrinsic turn-on time is negligible. Turn-on speed is substantially controlled by L_S + L_D.		

① T_J = 25°C to 150°C. ② Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 2%. ③ Repetitive Rating: Pulse width limited by max. junction temperature.



(TO-39)

All Dimensions in Millimeters and (Inches)