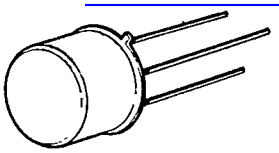
SEMELAB

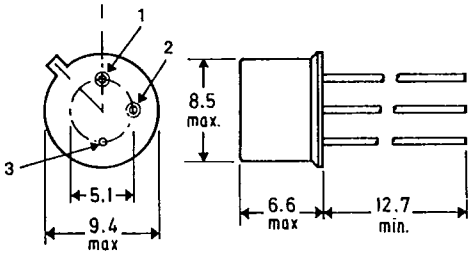


2N 6789
2N 6790

MOS POWER
N-Channel Enhancement Mode

MECHANICAL DATA

Dimensions in mm



PIN 1 – Source PIN 2 – Gate PIN 3 Drain and Case

TO 39

APPLICATIONS

- FAST SWITCHING
- MOTOR CONTROLS
- POWER SUPPLIES

ABSOLUTE MAXIMUM RATINGS (T_{CASE} = 25°C unless otherwise specified)

	Parameter	2N 6789	2N 6790
V_{DS}	Drain source voltage	150V	200V
V_{DGR}	Drain gate voltage (R_{GS} = 1 MΩ)	150V	200V
I_D @ T_C = 25°C	Continuous drain current	±3·5A	
I_D @ T_C = 100°C	Continuous drain current	±2·25A	
I_{DM}	Pulsed drain current (i)	±7·5A	
V_{GS}	Gate-source voltage	±40V	
P_D @ T_C = 25°C	Maximum power dissipation	20W	
P_D @ T_C = 100°C	Maximum power dissipation	8W	
Junction to case	Linear derating factor	0·16 W/°C	
Junction to ambient	Linear derating factor	0·005 W/°C	
T_J	Operating and	−55 to 150°C	
T_{stg}	storage temperature range		
Lead temperature	(1/16" from case for 10 secs.)	300°C	

(i) Pulse test: Pulse width ≤300μsec, duty cycle ≤2%

2N 6789 2N 6790

SEMELAB

ELECTRICAL CHARACTERISTICS (T_{CASE} = 25°C unless otherwise specified)

STATIC

Parameter		Type	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	2N6789	150*			V	V_{GS} = 0, I_D = 1.0 mA
		2N6790	200*			V	
$V_{GS(th)}$	Gate-Threshold Voltage	All	2.0*		4.0*	V	V_{DS} = V_{GS}, I_D = 1.0 mA
I_{GSSF}	Gate-Body Leakage Forward	All			100*	nA	V_{GS} = 20V
I_{GSSR}	Gate-Body Leakage Reverse	All			−100*	nA	V_{GS} = −20V
I_{DSS}	Zero Gate Voltage Drain Current	All			1.0*	mA	V_{DS} Max. Rating, V_{GS} = 0
		All			4.0*	mA	V_{DS} Max. Rating, V_{GS} = 0, T_C = 125 C
$I_{D(on)}$	On-State Drain Current[1]	2N6789	3.5			A	V_{DS}≥2$V_{DS(ON)}$, V_{GS} = 10V
		2N6790	3.5			A	V_{DS}≥2$V_{DS(ON)}$, V_{GS} = 10V
$V_{DS(on)}$	Static Drain-Source On-State Voltage[1]	2N6789			2.8*	V	V_{GS} = 10V , I_D = 3.5A
		2N6790			2.8*	V	V_{GS} = 10V , I_D = 3.5A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]	2N6789			0.8*	Ω	V_{GS} = 10V , I_D = 2.25A
		2N6790			0.8*	Ω	V_{GS} = 10V , I_D = 2.25A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]	2N6789			1.5*	Ω	V_{GS} =10V, I_D =2.25A T_C =125° C
		2N6790			1.5*	Ω	V_{GS} =10V, I_D =2.25A T_C =125° C

DYNAMIC

g_{fs}	Forward Transductance[1]	All	1.5*		4.5*	S (℧)	V_{DS}≥2$V_{DS(ON)}$, I_D= 2.25A
C_{iss}	Input Capacitance	All	200*		600*	pF	V_{GS} = 0 , V_{DS} = 25V, f = 1 MHz
C_{oss}	Output Capacitance	All	60*		300*	pF	
C_{rss}	Reverse Transfer Capacitance	All	15*		80*	pF	
$t_{d(on)}$	Turn-On Delay Time	All			40*	ns	V_{DD} = 74V , I_D = 2.25A, R_g = 25Ω , R_L = 32Ω (MOS FET switching times are essentially independent of operating temperature)
t_r	Rise Time	All			50*	ns	
$t_{d(off)}$	Turn-Off Delay Time	All			50*	ns	
t_f	Fall Time	All			50*	ns	

THERMAL RESISTANCE

R_{thJC}	Junction-to-Case	All			6.25*	°C/W	
R_{thJA}	Junction-to-Ambient	All			170	°C/W	Free Air Operation

BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS

I_S	Continuous Source Current (Body Diode)	2N6789			−3.5*	A	Modified MOS POWER symbol showing the intergal P-N junction rectifer. 
		2N6790			−3.5*	A	
I_{SM}	Source Current[1] (Body Diode)	2N6789			−7.50	A	
		2N6790			−7.50	A	
V_{SD}	Diode Forward Voltage[1]	2N6789	−0.7		−1.5*	V	T_C=25°C, I_S=−3.5, V_{GS} = 0
		2N6790	−0.7		−1.5*	V	T_C=25°C, I_S=−3.5, V_{GS} = 0
t_{rr}	Reverse Recovery Time	All		450		ns	T_J =150°C, I_F = I_S, dI_F/dt = 100 A/μs

1 Pulse Test: Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%
*JEDEC Registered Values