N- Channel Enhancement Mode MOSFET

◆ DESCRIPTION

The MT4800 MOSFET from MATRIX provide the designer with the best combination of fast switching, Ruggedized device design, low on-resistance and cost-effectiveness.

The SO-8 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

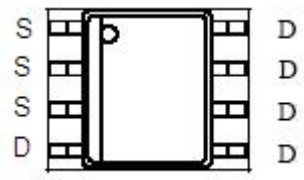
◆ FEATURES

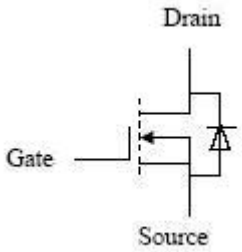
- 30V/9.4A, $R_{DS(ON)}$ = 18mΩ @ V_{GS} = 10V
- SO-8 package design
- Simple Drive Requirement
- Low On-resistance
- Fast Switching

◆ APPLICATIONS

- POWER Management in Note
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch

◆ PIN CONFIGURATION





◆ ABSOLUTE MAXIMUM RATINGS

(T_A=25℃ Unless Otherwise Noted)

Parameter		Symbol	Maximum	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±25	V
Continuous Drain Current[3]	T_A=25°C	I_D	9.4	A
	T_A=70°C		7.5	
Pulsed Drain Current[1]		I_{DM}	40	A
Total Power Dissipation	T_A=25°C	P_D	2.5	W
Linear Derating Factor			0.02	W/°C
Storage Temperature Range		T_{STG}	-55 to 150	°C
Operating Junction Temperature Range		T_J	- 55 to 150	°C

◆ THERMAL RESISTANCE RATINGS

Thermal Resistance	Symbol	Maximum	Unit
Thermal Resistance Junction-ambient[3]	R_{thj-a}	50	°C/W

◆ ELECTRICAL CHARACTERISTICS

(T_A=25℃ Unless Otherwise Noted)

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Parameters							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS} = 0V, I_D = 250μA	30	-	-	V
Breakdown Voltage Temperature Coefficient		$\Delta BV_{DSS}/\Delta Tj$	Reference to 25°C, I_D=1mA	-	0.02	-	V/°C
Static Drain-Source On-Resistance[2]		$R_{DS(ON)}$	V_{GS} = 10V, I_D =9A	-	14	18	mΩ
			V_{GS} = 4.5V, I_D = 7A	-	18	30	
Gate Threshold Voltage		$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	-	3	V
Forward Transconductance		g_{fs}	V_{DS} = 10V, I_D = 9A	-	16	-	S
Drain-Source Leakage Current	T_J=25°C	I_{DSS}	V_{DS} = 30V, V_{GS}= 0V	-	-	1	uA
	T_J=70°C		V_{DS} = 24V, V_{GS}= 0V	-	-	25	
Gate-Source Leakage		I_{GSS}	V_{GS}=±25V	-	-	±100	nA
Dynamic Parameters							
Total Gate Charge[2]		Q_g	I_D=9A, V_{DS}=20V, V_{GS}=4.5V	-	7	12	nc
Gate-Source Charge		Q_{gs}		-	1	-	
Gate-Drain("Miller")Charge		Q_{gd}		-	4.5	-	
Turn-on Delay Time[2]		$t_{d(on)}$	V_{DS}=15V, I_D=1A, R_G=3.3Ω, V_{GS}=10V, R_D=15Ω	-	7	-	ns
Rise Time		t_r		-	8	-	
Turn-off Delay Time		$T_{d(off)}$		-	18	-	
Fall time		T_f		-	8	-	
Input Capacitance		C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz	-	420	670	pF
Output Capacitance		C_{oss}		-	210	-	
Reverse Transfer Capacitance		C_{rss}		-	70	-	
Gate Resistance		R_g	F=1.0MHz	-	3.5	5	Ω

◆ Source-Drain Diode

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Forward On Voltage[2]	V_{SD}	I_S=1.9A, V_{GS}=0V	-	-	1.3	V
Reverse Recovery Time	t_{rr}	I_S=9A,	-	25	-	ns
Reverse Recovery Charge	Q_{rr}	V_{GS}=0V,dI/dt=100A/μs	-	15	-	nC

Notes:

1. Pulse width limited by Max. junction temperature.
2. Pulse width ≦300us, duty cycle ≦ 2%
3. Surface mounted on 1 in^2 copper pad of FR4 board, t ≦10sec;125 °C/W when mounted on Min.copper pad.

◆ TYPICAL CHARACTERICTICS

(25℃ Unless Noted)

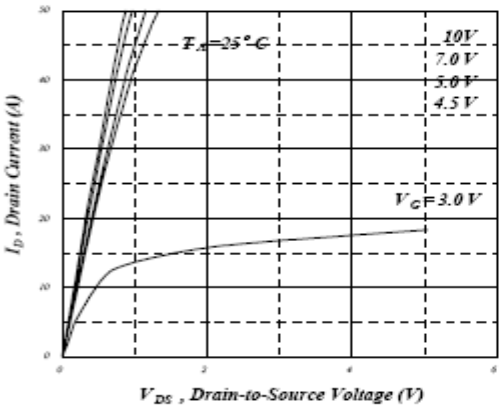


Fig 1. Typical Output Characteristics

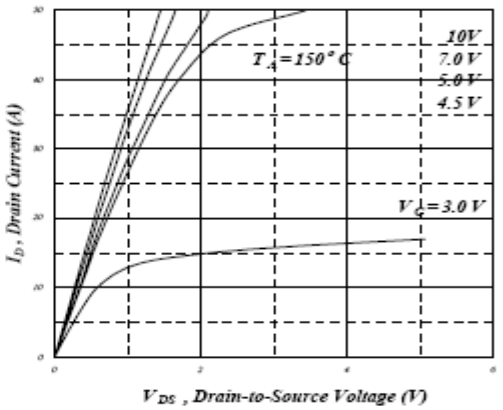


Fig 2. Typical Output Characteristics

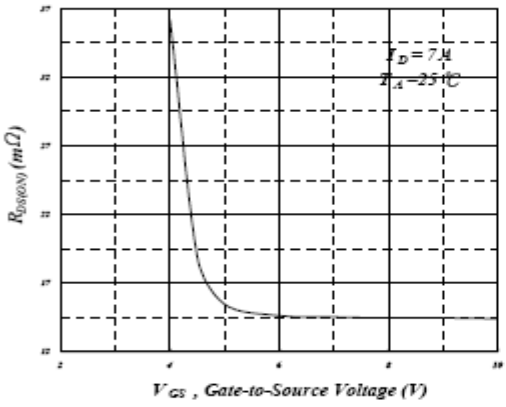


Fig 3. On-Resistance v.s. Gate Voltage

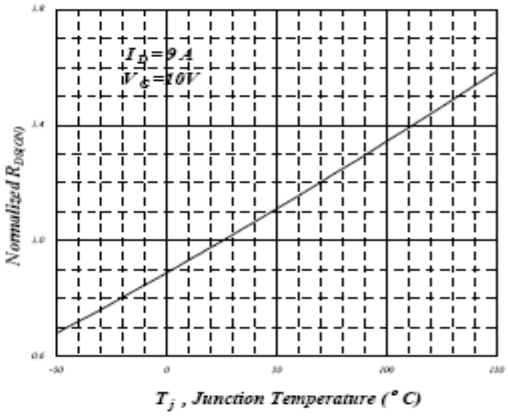


Fig 4. Normalized On-Resistance v.s. Junction Temperature

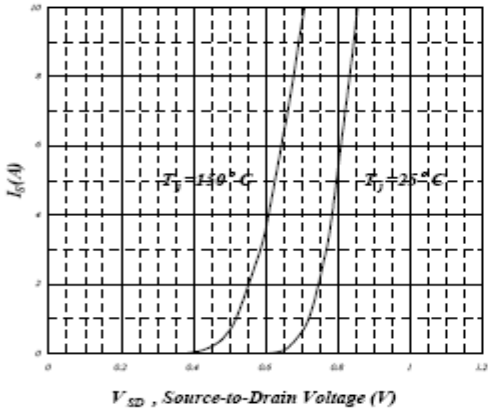


Fig 5. Forward Characteristic of Reverse Diode

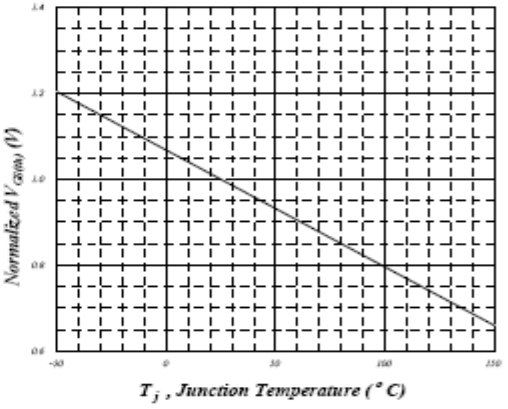


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

◆ TYPICAL CHARACTERICTICS

(25℃ Unless Noted)

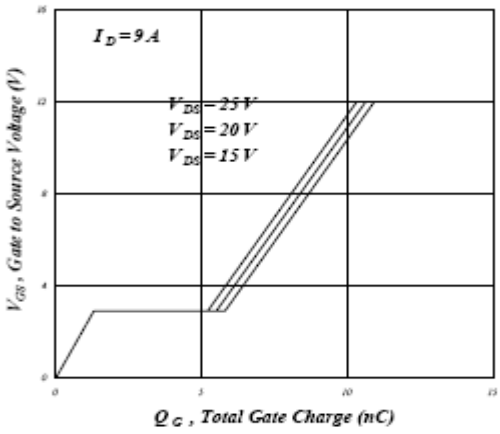


Fig 7. Gate Charge Characteristics

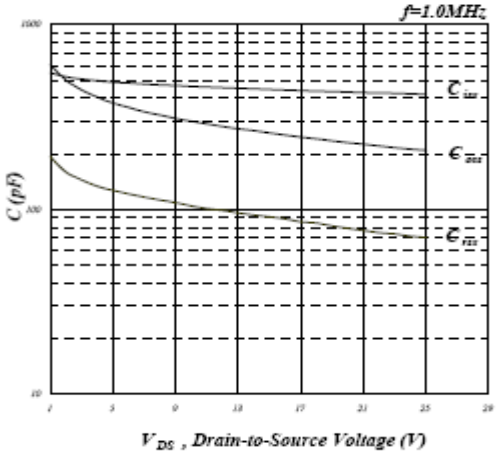


Fig 8. Typical Capacitance Characteristics

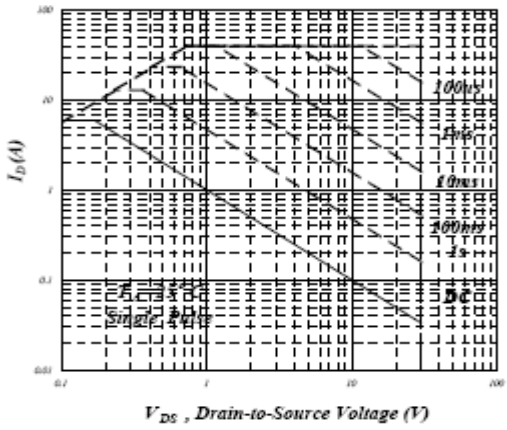


Fig 9. Maximum Safe Operating Area

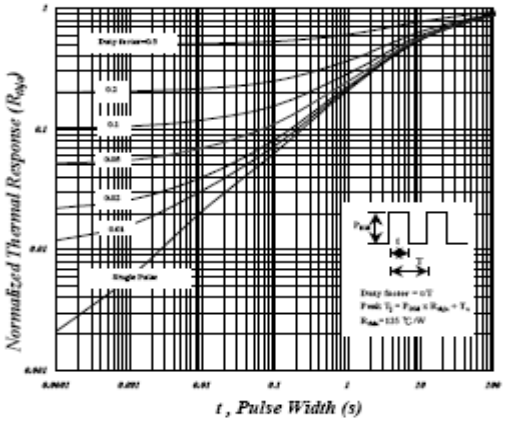


Fig 10. Effective Transient Thermal Impedance

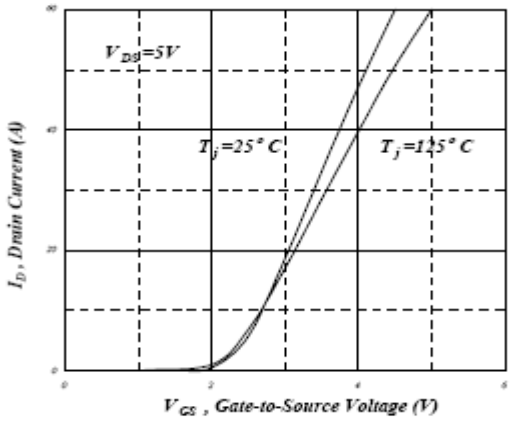


Fig 11. Transfer Characteristics

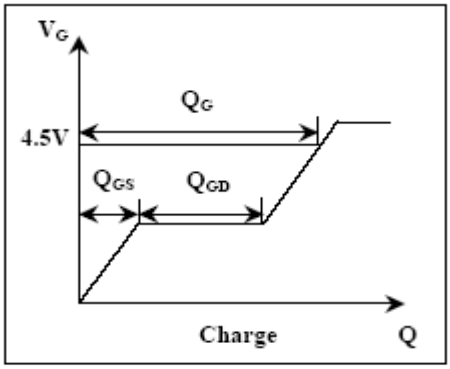
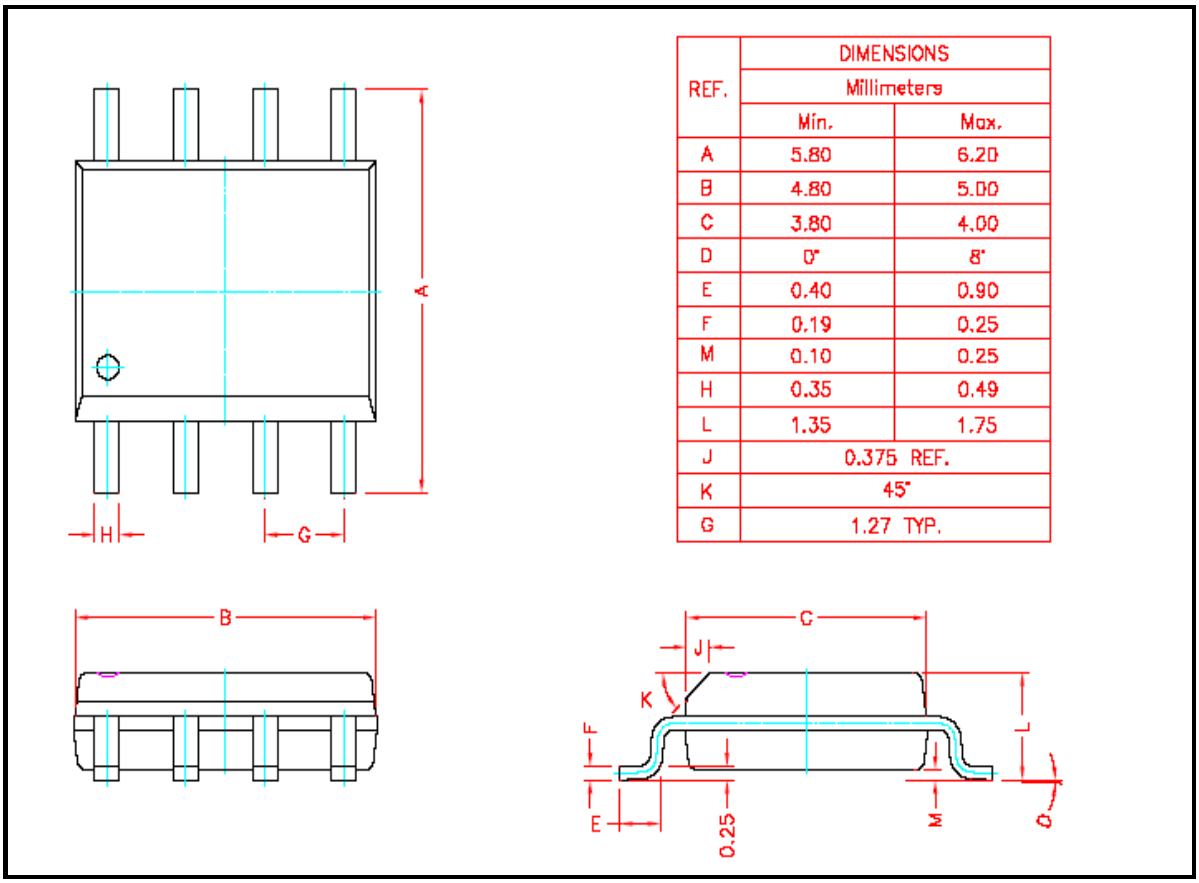


Fig 12. Gate Charge Waveform

◆ PHYSICAL DIMENSIONS:

8-Pin Plastic S.O.I.C. (M)



REF.	DIMENSIONS Millimeters	
	Min.	Max.
A	5.80	6.20
B	4.80	5.00
C	3.80	4.00
D	0°	8°
E	0.40	0.90
F	0.19	0.25
M	0.10	0.25
H	0.35	0.49
L	1.35	1.75
J	0.375 REF.	
K	45°	
G	1.27 TYP.	