Eternal Semiconductor Inc.

GM4953

Dual P-Channel Enhancement-Mode MOSFET (-20V, -4.8A)

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (mΩ)TYP
-20V	-4.8A	85 @V_{GS} = -2.5V,ID=-2.0A
		75 @V_{GS} = -4.5V,ID=-4.8A

Features

- Advanced Trench Process Technology
- High Density Cell Design for Ultra Low On-Resistance
- Surface mount Package
- Ordering information： GM4953（Lead（Pb）-free
  GM4953-G（Lead（Pb）-free and halogen-free）

SOP-8

Pin1: Soure1
Pin2: Gate1
Pin3: Soure2
Pin4: Gate2
Pin5/6:Drain2
Pin7/8:Drain1

TOP Marking

GM4953 part number
xxxxxx ID CODE

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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Drain Current (Continuous)	-4.8	A
I_{DM}	Drain Current (Pulsed) [a]	-18	A
P_D	Total Power Dissipation @T_A=25°C	2	W
I_S	Maximum Diode Forward Current	-2	A
T_j, T_{stg}	Operating Junction and Storage Temperature Range	-55 to +150	°C
R_{QJA}	Thermal Resistance Junction to Ambient (PCB mounted)[b]	60	°C/W

a: Repetitive Rating: Pulse width limited by the maximum junction temperature.

b: 1-in^2 2oz Cu PCB board

Electrical Characteristics (T_A=25°C, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						

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BV$_{DSS}$	Drain-Source Breakdown Voltage	V$_{GS}$=0V, I$_D$=-250uA	-20	-	-	V
I$_{DSS}$	Zero Gate Voltage Drain Current	V$_{DS}$=-18V, V$_{GS}$=0V	-	-	-1	μA
I$_{GSS}$	Gate-Body Leakage Current	V$_{GS}$=±10V, V$_{DS}$=0V	-	-	±100	nA
• **On Characteristics**						
V$_{GS(th)}$	Gate Threshold Voltage	V$_{DS}$=V$_{GS}$, I$_D$=-250uA	-0.4	-0.7	-1	V
R$_{DS(on)}$	Drain-Source On-State Resistance	V$_{GS}$=-4.5V, I$_D$=-4.8A	-	75	85	mΩ
		V$_{GS}$=-2.5V, I$_D$=-2A	-	85	100	
• **Dynamic Characteristics**						
C$_{iss}$	Input Capacitance		-	589	-	PF
C$_{oss}$	Output Capacitance	V$_{DS}$=-6V, V$_{GS}$=0V, f=1MHz	-	91	-	
C$_{rss}$	Reverse Transfer Capacitance		-	67	-	
• **Switching Characteristics**						
Q$_g$	Total Gate Charge		-	6.55	-	nC
Q$_{gs}$	Gate-Source Charge	V$_{DS}$=-6V, I$_D$=-2.8A, V$_{GS}$=-4.5V	-	0.31	-	
Q$_{gd}$	Gate-Drain Charge		-	1.3	-	
t$_{d(on)}$	Turn-on Delay Time		-	9.7	-	nS
t$_r$	Turn-on Rise Time	V$_{DD}$=-6V, R$_L$=5W, I$_D$=-1A, VGEN=-4.5V, RG=6W	-	3.5	-	
t$_{d(off)}$	Turn-off Delay Time		-	33.3	-	
t$_f$	Turn-off Fall Time		-	4.5	-	
• **Drain-Source Diode Characteristics**						
V$_{SD}$	Drain-Source Diode Forward	V$_{GS}$=0V, I$_S$=-2A	-	-	-1.2	V

Note: Pulse Test: Pulse Width≤300us, Duty Cycle≤2%
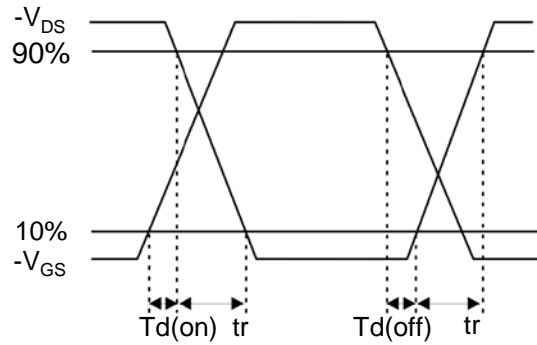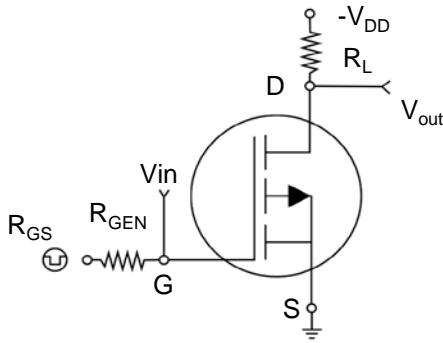
Switching Test Circuit and Swithcing Waveforms

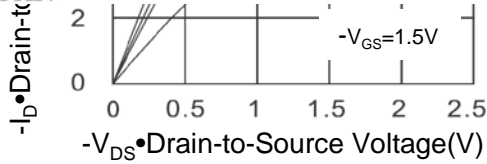## Typical Characteristics Curves (Ta=25°C, unless otherwise note)
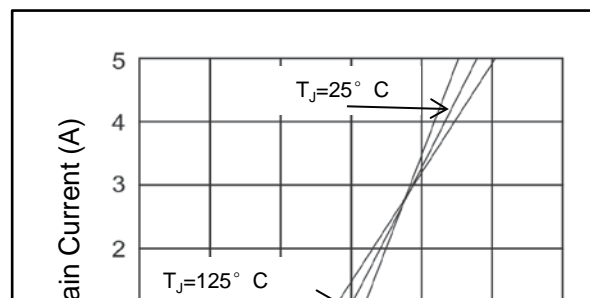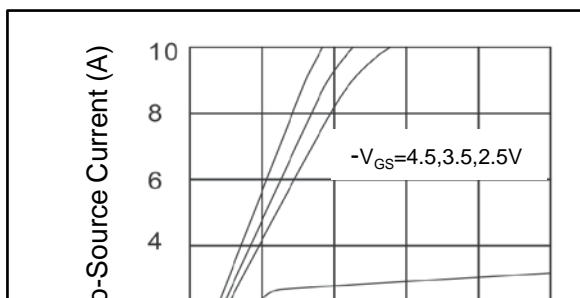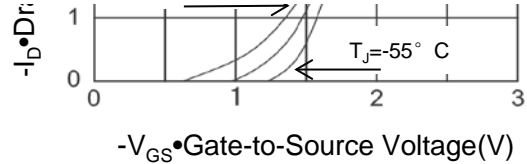
Fig.1 Output Characteristic

$-I_D \bullet$Drain-to... $-V_{GS}=1.5V$
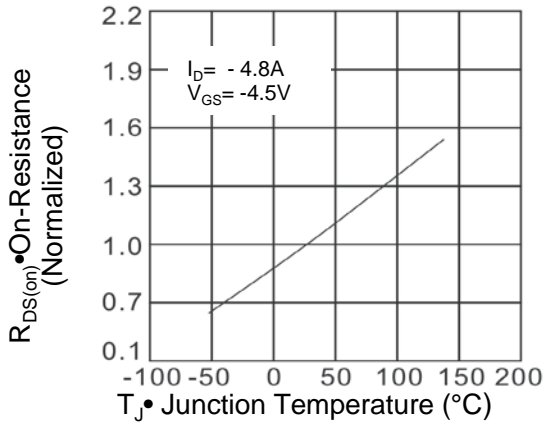
$-V_{DS}\bullet$Drain-to-Source Voltage(V)

Fig . 2 Transfer Characteristic

$-I_D \bullet$Dra... $T_J=-55°$ C

$-V_{GS}\bullet$Gate-to-Source Voltage(V)

**Fig. 3 On-Resistance Variation
with Temperature**

$I_D = -4.8A$
$V_{GS}= -4.5V$

$R_{DS(on)}\bullet$On-Resistance (Normalized)

$T_J \bullet$ Junction Temperature (°C)
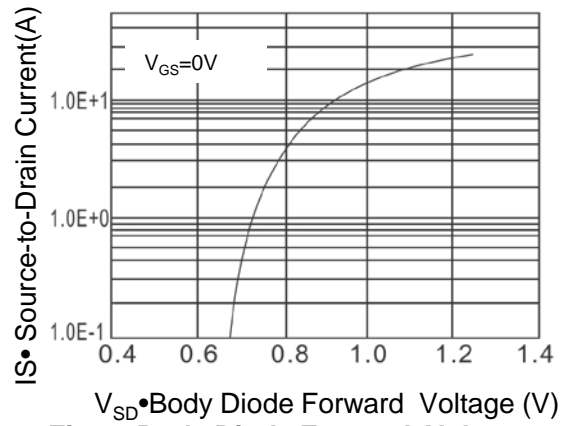
**Fig . 4 Body Diode Forward Voltage
Variation with Source Current**

$V_{GS}=0V$

IS$\bullet$ Source-to-Drain Current(A)

$V_{SD}\bullet$Body Diode Forward Voltage (V)
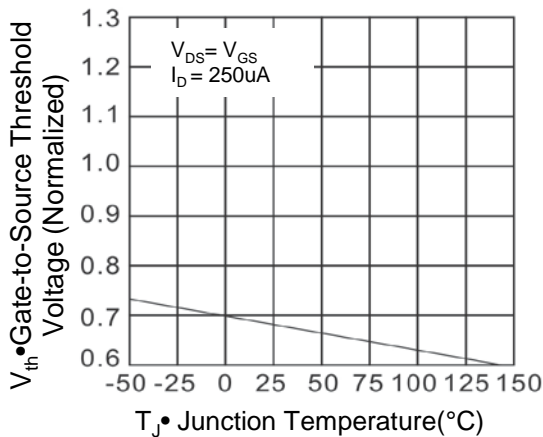
**Fig. 5 Gate Threshold Variation
with Temperature**

$V_{DS}= V_{GS}$
$I_D = 250uA$

$V_{th}\bullet$Gate-to-Source Threshold Voltage (Normalized)

$T_J\bullet$ Junction Temperature(°C)

Fig. 6 Gate Charge

$V_{DS}= -10V$
$I_D = -6A$

$V_{GS}\bullet$Gate-to-Source voltage(V)
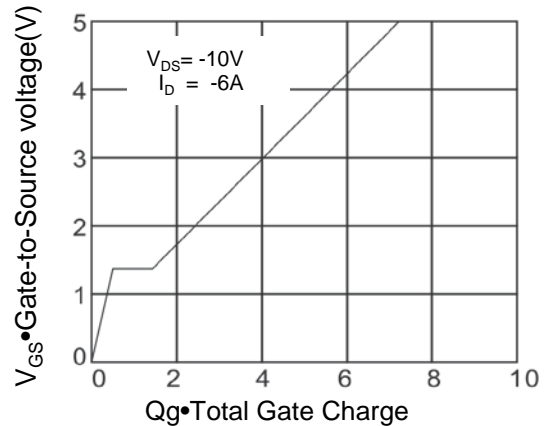
Qg$\bullet$Total Gate Charge
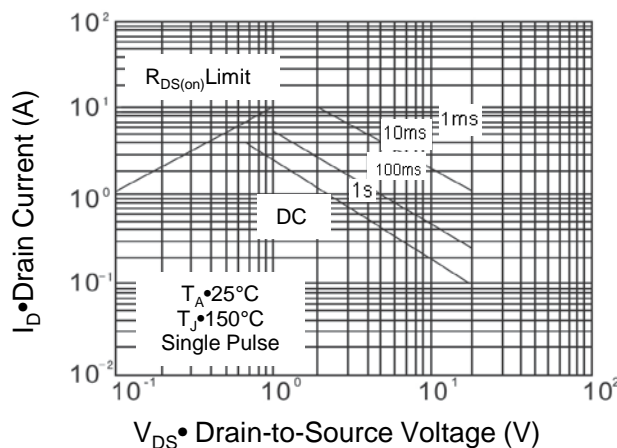
Fig. 7 Maximum Safe Operating Area

$R_{DS(on)}$Limit

1ms
10ms
100ms
1s
DC

$T_A \bullet 25°C$
$T_J \bullet 150°C$
Single Pulse

$I_D \bullet$Drain Current (A)

$V_{DS}\bullet$ Drain-to-Source Voltage (V)

Fig .8 Nonmalized Thermal Transient Impedance Curve

1. $R_{JA}(t) = r(t) * RJA$
2. R_{JA} = See Datasheet
3. $TJM-T_A = P * R_{JC}(t)$
4. Duty Cycle, $D = t1/T2$
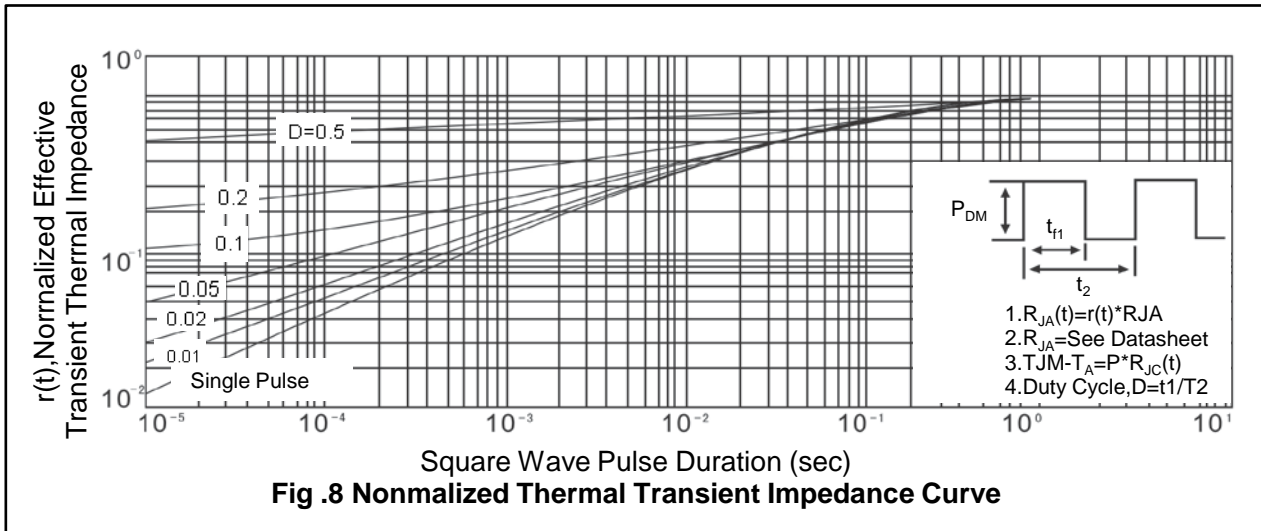
sop-8 PACKAGE OUTLINE DIMENSIONS

DS-

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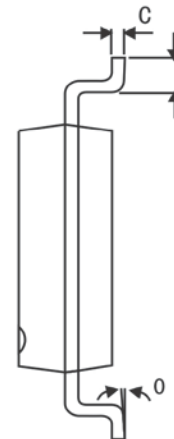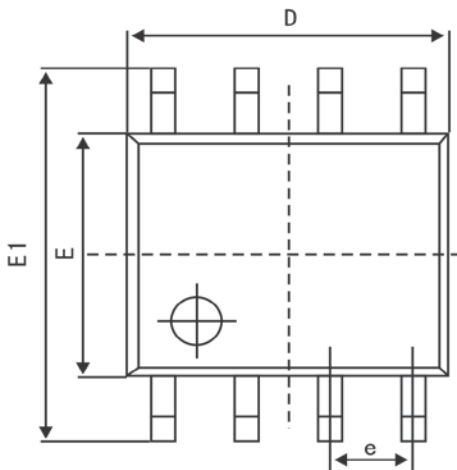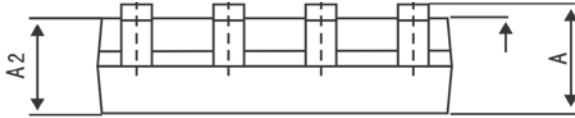
Symbol	Dimensions In Millimeters (MM)		Dimensions In Inches (MIL)	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.700	5.100	0.185	0.201
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270（BSC)		0.050（BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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