Eternal Semiconductor Inc.

YI-YUAN

ET40P07

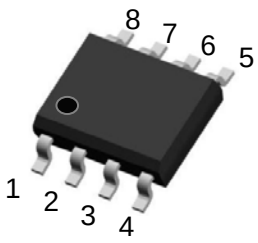
P-Channel Enhancement-Mode MOSFET (-40V, -6A)

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (mΩ)TYP
-40V	-6.2A	16 @ VGS = -10 V, ID=-6A
		21@ VGS = -4.5 V, ID=-5A

Features

- Advanced Trench Process Technology
- High Density Cell Design for Ultra Low On-Resistance
- Fully Characterized Avalanche Voltage and Current
- Improved Shoot-Through FOM
- Lead（Pb）-free and halogen-free



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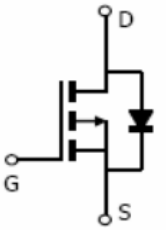


Pin1/2/3: Soure
Pin4: Gate
Pin5/6/7/8:Drain

TOP Marking
40P07

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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-40	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current (Continuous)	-6.2	A
I_{DM}	Drain Current (Pulsed) [a]	-40	A
P_D	Total Power Dissipation @T_A=25°C	2.0	W
E_{AS} [b]	Avalanche Energy, Single pulse (L=0.3mH)	35	mJ
I_S	Maximum Diode Forward Current	-6	A
T_j, T_{stg}	Operating Junction and Storage Temperature Range	-55 to +150	°C
R_{QJA}	Maximum Junction-to-Ambient (t ≤ 10s)[c]	58	°C/W
	Maximum Junction-to-Ambient (Steady State)[c]	78	°C/W

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

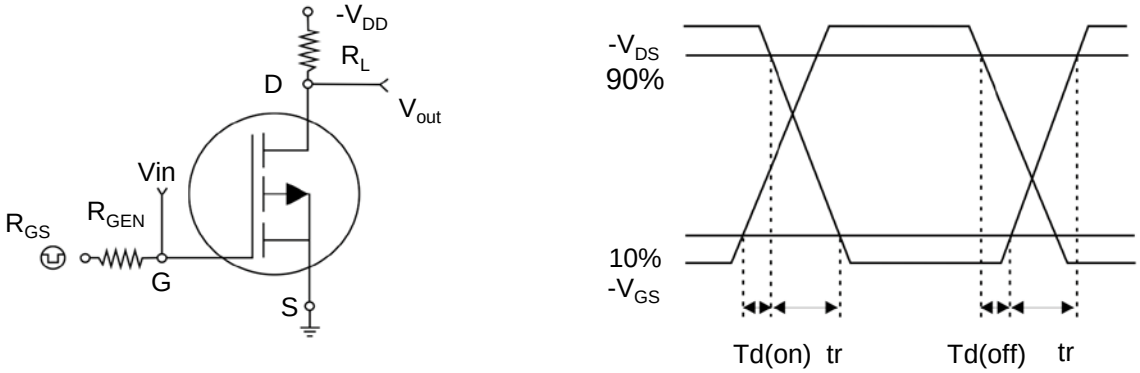
b:Surface Mounted on 1in2 pad area, t<10sec.

c: 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						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250uA	-40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-40V, V_{GS}=0V	-	-	-1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
• On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	-1.1	-1.7	-2.5	V
$R_{DS(on)}$	Drain-Source On-State	V_{GS}=-10V, I_D=-6A	-	16	25	mΩ
$R_{DS(on)}$	Drain-Source On-State	V_{GS}=-4.5V, I_D=-5A	-	21	30	mΩ
• Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-15V, V_{GS}=0V, f=1MHz	-	1785	-	PF
C_{oss}	Output Capacitance		-	215	-	
C_{rss}	Reverse Transfer Capacitance		-	180	-	
• Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=-15V, ID=-9A, V_{GS}=-10V	-	26	-	nC
Q_{gs}	Gate-Source Charge		-	3.6	-	
Q_{gd}	Gate-Drain Charge		-	7	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=-15V, RL=5Ω, ID=-2A, VGEN=-10V, RG=3Ω	-	8	-	nS
t_r	Turn-on Rise Time		-	7	-	
$t_{d(off)}$	Turn-off Delay Time		-	25	-	
t_f	Turn-off Fall Time		-	10	-	
• Drain-Source Diode Characteristics						
V_{SD}	Drain-Source Diode Forward	V_{GS}=0V, I_S=-2.0A	-	-	-1.3	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)

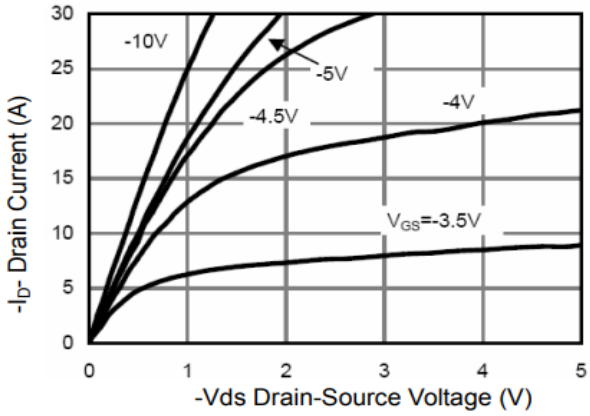


Figure 1 Output Characteristics

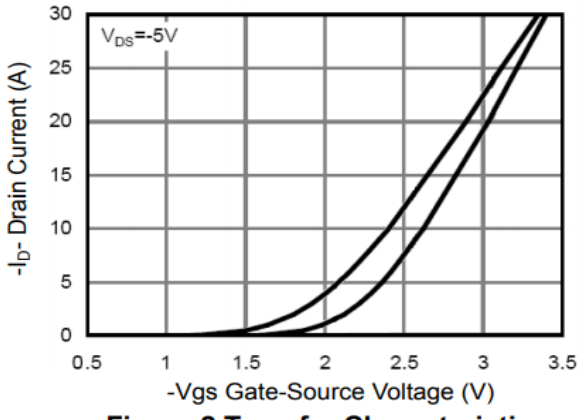


Figure 2 Transfer Characteristics

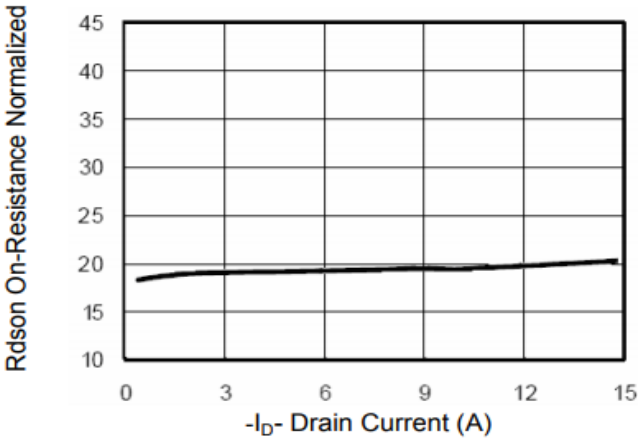


Figure 3 Rdson- Drain Current

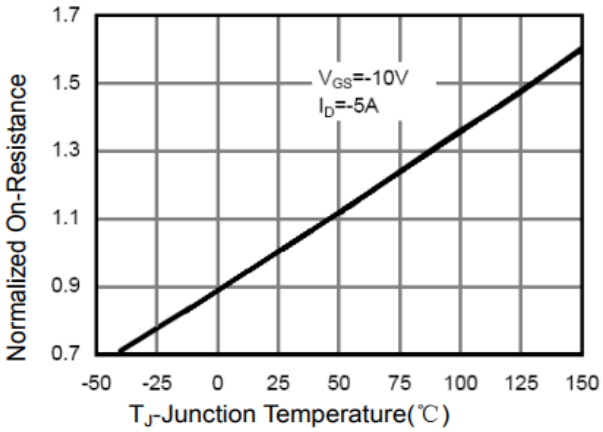


Figure 4 Rdson-Junction Temperature

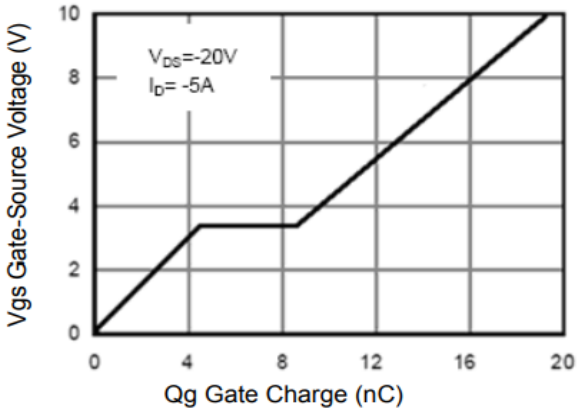


Figure 5 Gate Charge

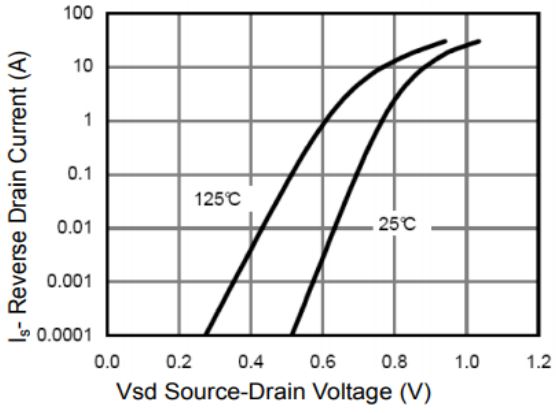


Figure 6 Source- Drain Diode Forward

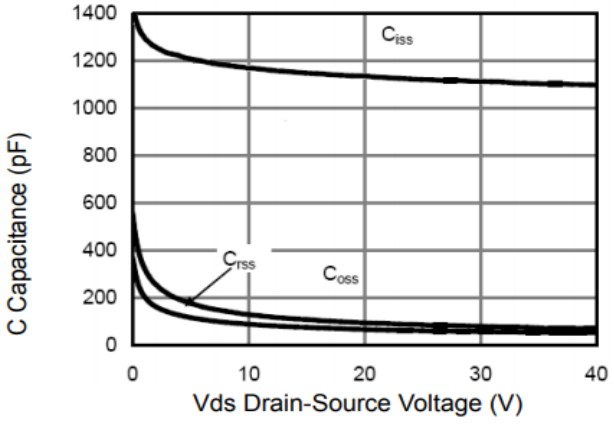


Figure 7 Capacitance vs Vds

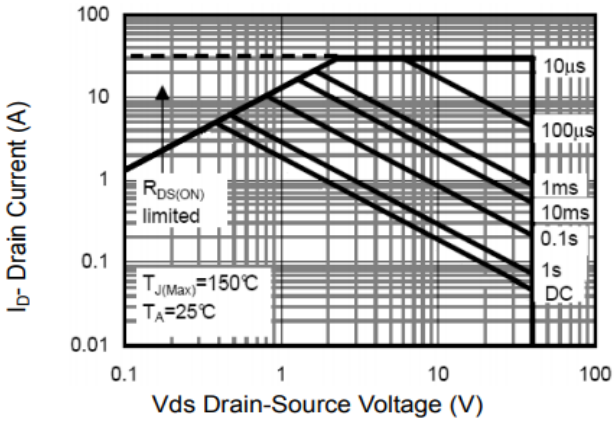


Figure 8 Safe Operation Area

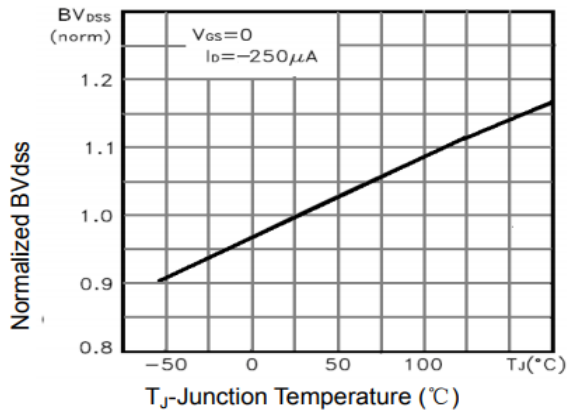


Figure 9 BV_{DSS} vs Junction Temperature

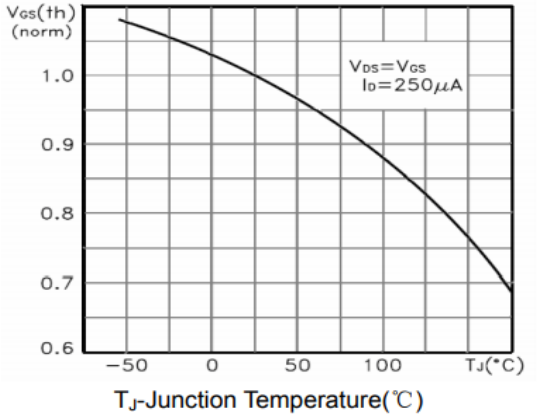


Figure 10 $V_{GS(th)}$ vs Junction Temperature

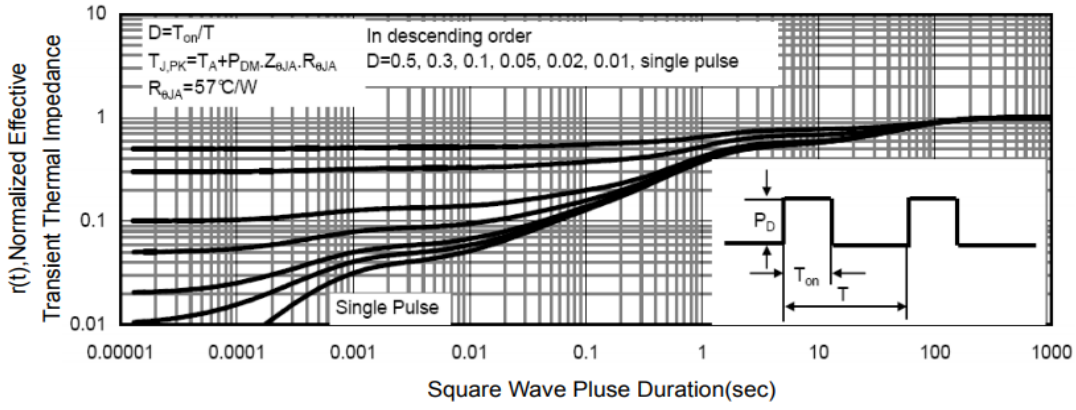
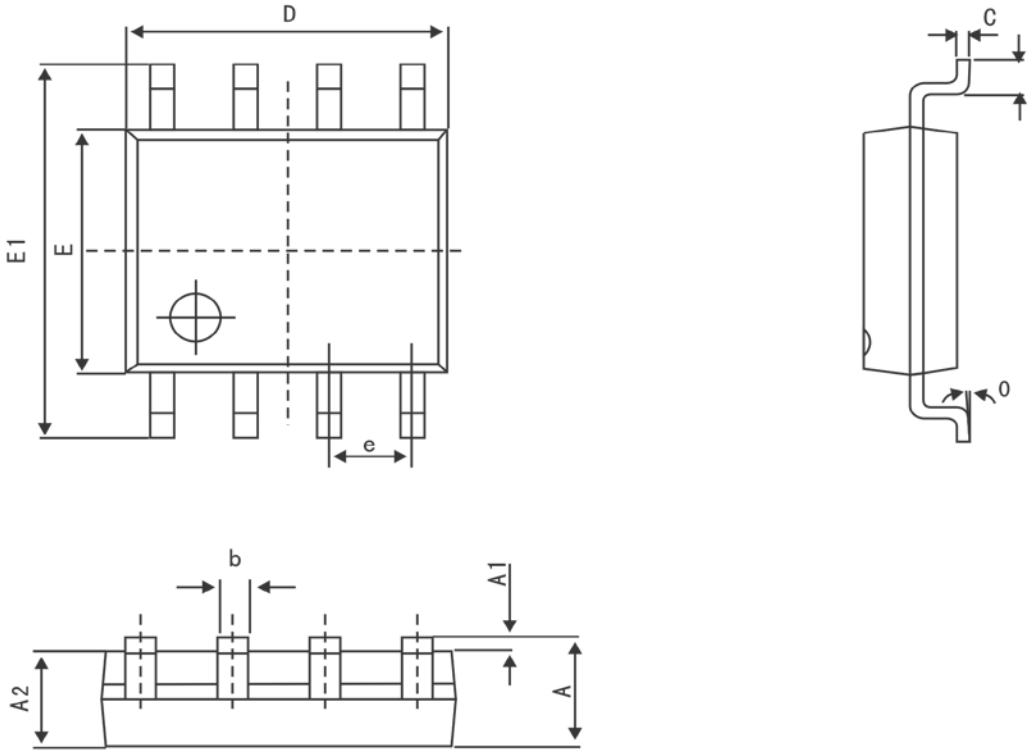


Figure 11 Normalized Maximum Transient Thermal Impedance

SOP-8 PACKAGE OUTLINE DIMENSIONS



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°