Eternal Semiconductor Inc.

ET6440

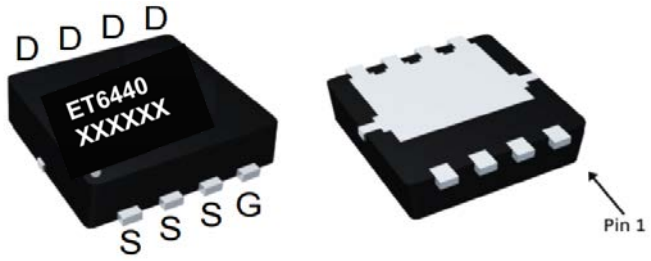
N-Channel Enhancement-Mode MOSFET (40V,40A)

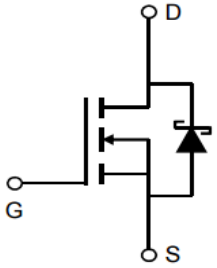
PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (mΩ)Typ.
40V	40A	5.7@ VGS = 10V, ID=15A
		8.3 @ VGS = 4.5V, ID=10A

Features

- Super high density cell design for extremely low RDS(ON)
- Exceptional on-resistance and maximum DC current capability
- Fast Switching Speed
- Lead（Pb）-free and halogen-free





Pin 1 / 2 / 3: Source
Pin 4: Gate
Pin 5 / 6 / 7 / 8: Drain

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)@TA=25°C	40	A
	Drain Current (Continuous)@TA=75°C	27	A
I_{DM}	Drain Current (Pulsed) [a]	160	A
P_D	Total Power Dissipation @T_c=25°C	30	W
	Total Power Dissipation @T_c=75°C	15	W
E_{AS}	Single pulse avalanche energy	60	mJ
I_S	Maximum Diode Forward Current	45	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]	35	°C/W

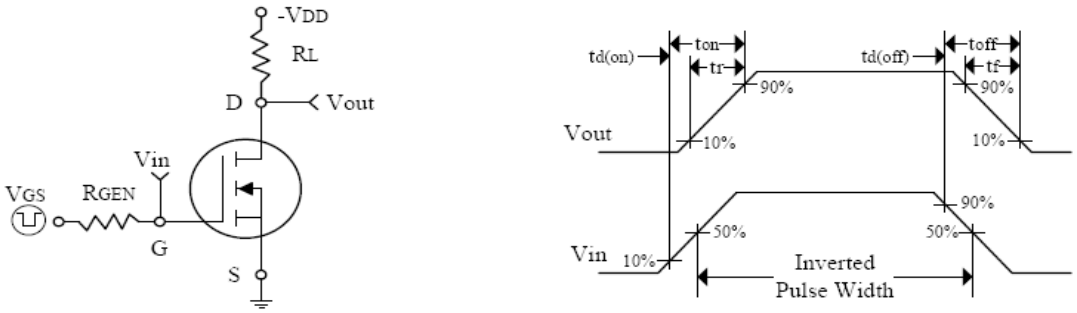
a: Repetitive Rating: Pulse width limited by the maximum junction temperature.

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

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

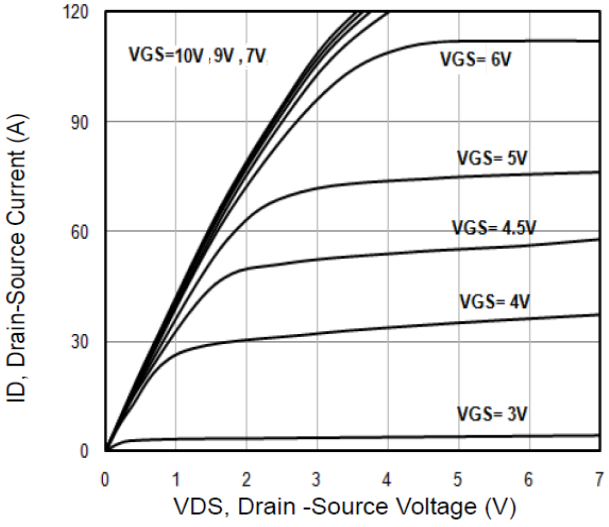
Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
• On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1.0		2.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=4.5V, I_D=10A	-	8.3	12	mΩ
		V_{GS}=10V, I_D=15A	-	5.7	7	
gfs	Forward Transconductance	V_{DS}=10V,ID=40A		6		S
• Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=20V, V_{GS}=0V, f=1MHz	-	1010	-	PF
C_{oss}	Output Capacitance		-	350	-	
C_{rss}	Reverse Transfer Capacitance		-	25	-	
• Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=20V, I_D=40A, V_{GS}=10V	-	14	-	nC
Q_{gs}	Gate-Source Charge		-	2.6	-	
Q_{gd}	Gate-Drain Charge		-	6	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=20V, R_L=15Ω, I_D=40A, V_{GEN}=10V, RG=3Ω	-	5	-	nS
t_r	Turn-on Rise Time		-	25	-	
$t_{d(off)}$	Turn-off Delay Time		-	32	-	
t_f	Turn-off Fall Time		-	10	-	
• Drain-Source Diode Characteristics						
V_{SD}	Drain-Source Diode Forward	V_{GS}=0V, I_S=20A	-	-	1.2	V
Rg	Gate resistance	V_{GS}=0V, VDS=0V,F=1MHz	-	2	-	Ω

Note: Pulse Test: Pulse Width≤300us, Duty Cycle≤2%

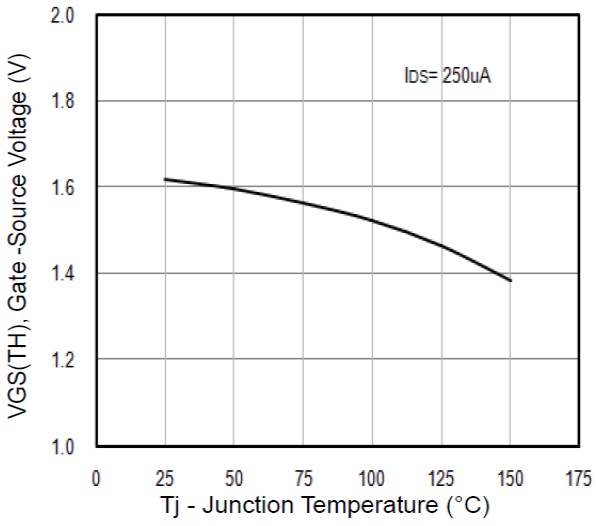


Switching Test Circuit and Switching Waveforms

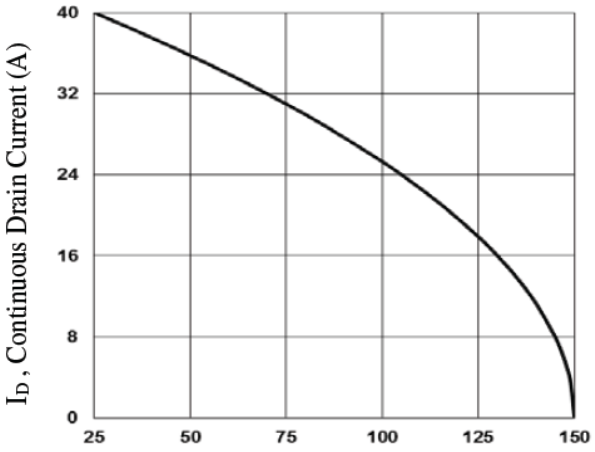
Typical Characteristics Curves (Ta=25°C, unless otherwise noted)



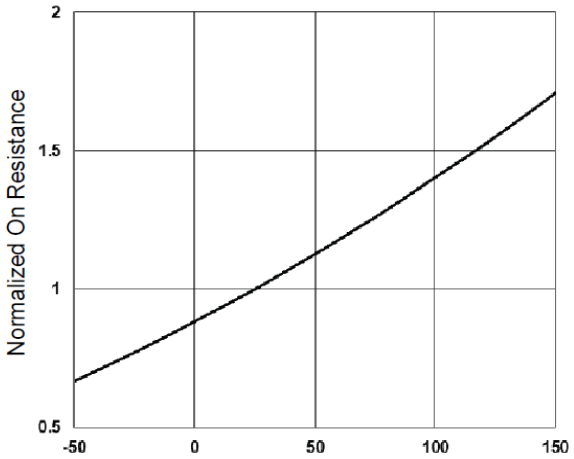
Typical Output Characteristics



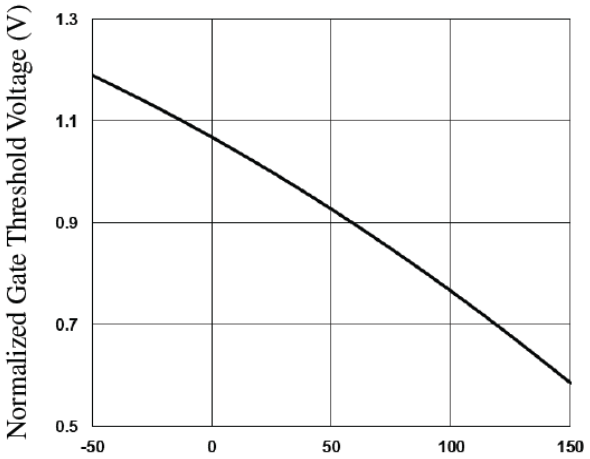
$V_{GS(TH)}$ Gate -Source Voltage Vs.Tj



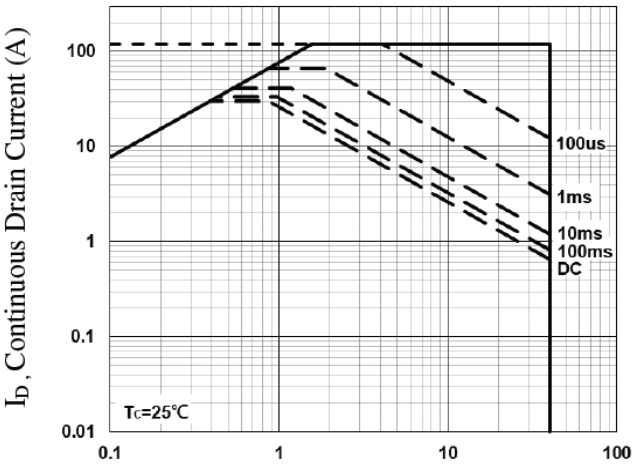
Continuous Drain Current vs.Tc



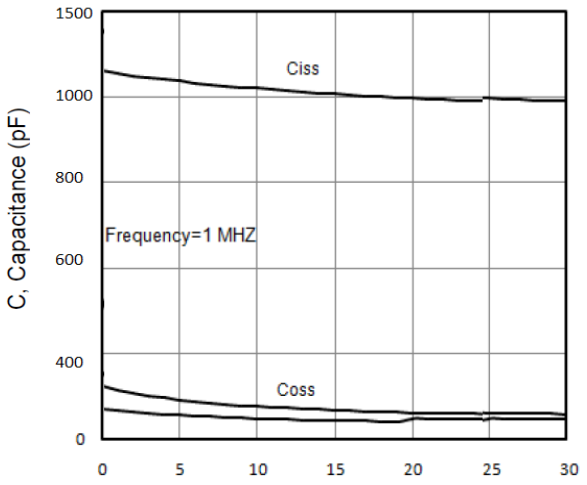
Normalized On-Resistance Vs. Tj



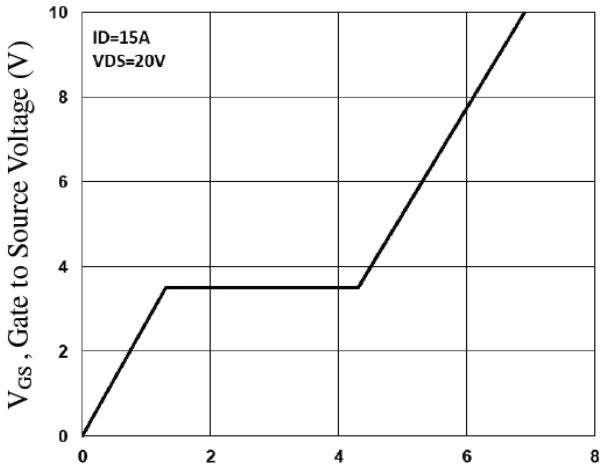
Normalized Vth vs.TJ



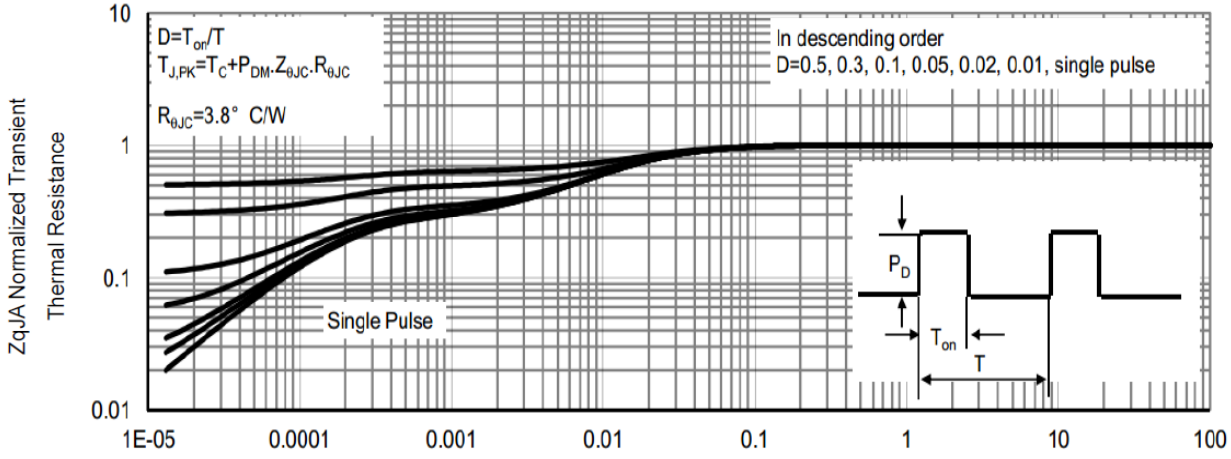
Maximum Safe Operation Area



Typical Capacitance Vs.Drain-Source Voltage

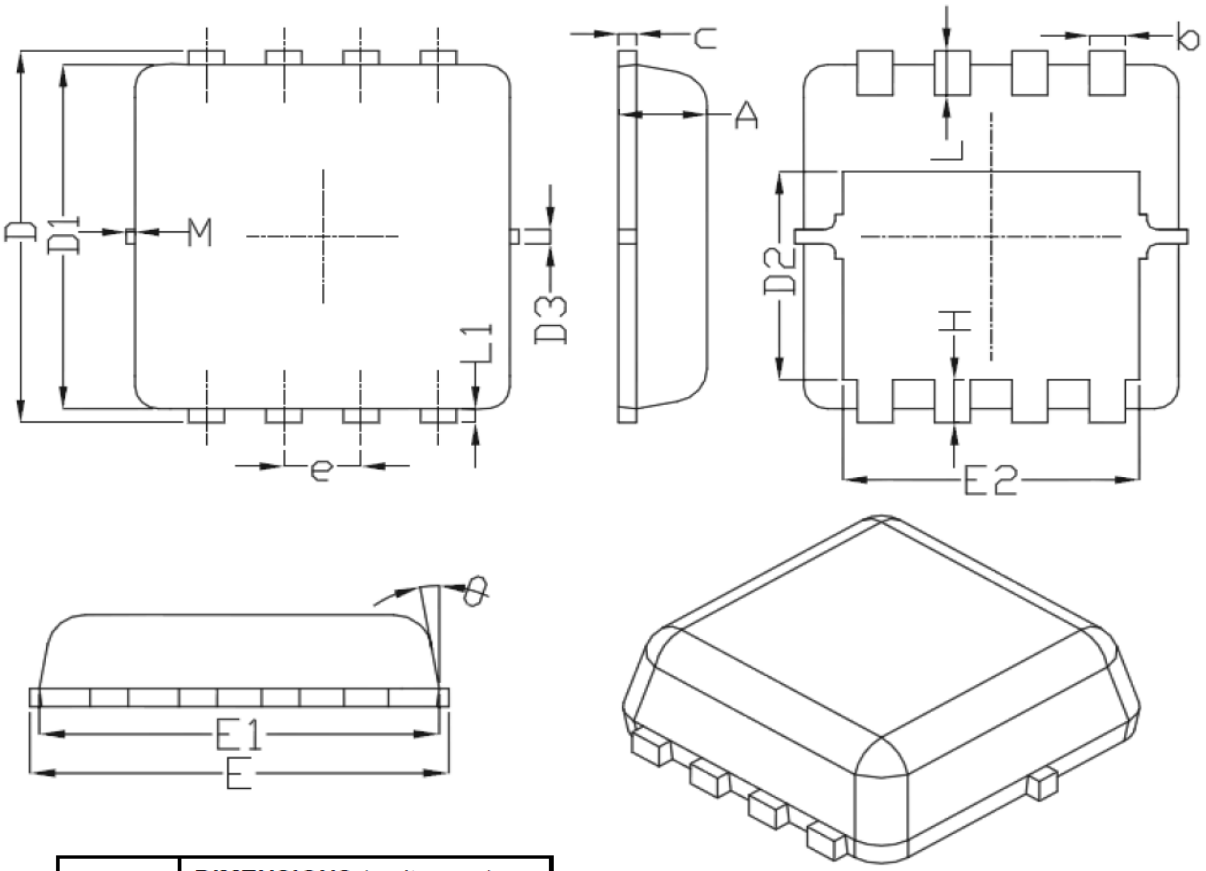


Gate Charge Waveform



Normalized Maximum Transient Thermal Impedance

PDFN3333 PACKAGE OUTLINE DIMENSIONS



Symbol	DIMENSIONS (unit : mm)		
	Min	Typ	Max
A	0.7	0.75	0.8
b	0.25	0.3	0.35
C	0.1	0.15	0.25
D	3.25	3.35	3.45
D1	3	3.1	3.2
D2	1.78	1.88	1.98
D3	--	0.13	--
E	3.2	3.3	3.4
E1	3	3.15	3.2
E2	2.39	2.49	2.59
e	0.65 BSC		
H	0.3	0.39	0.5
L	0.3	0.4	0.5
L1	--	0.13	--
θ	--	10°	12°
M	*	*	0.15