PE8240MA N-Channel Enhancement Mode Power MOSFET

PE8240MA Description

The PE8240MA uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. It can be used in a wide variety of applications. It is ESD protected.

PE8240MA General Features

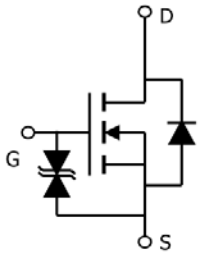
- V_{DS} = 18V, I_D = 36A

  $R_{DS(ON)}$ < 5.2mΩ @ V_{GS}=4.5V
  $R_{DS(ON)}$ < 6.7mΩ @ V_{GS}=2.5V
  $R_{DS(ON)}$ < 9mΩ @ V_{GS}=1.8V
  ESD Rating: 2000V HBM

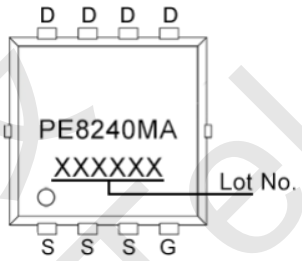
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

PE8240MA Application

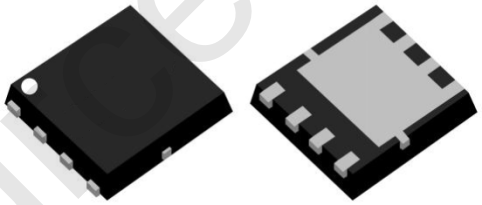
- PWM applications
- Load switch
- Power management
- Battery Protection



Schematic diagram



Marking and pin assignment



PDFN3.3x3.3-8L

PE8240MA Absolute Maximum Ratings (TC=25℃ unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	18	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous	I_D	36	A
Drain Current-Continuous(TC=100℃)	I_D	27	A
Pulsed Drain Current (Note 1)	I_{DM}	144	A
Maximum Power Dissipation	P_D	36	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

PE8240MA Thermal Characteristic

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.5	℃/W

PE8240MA Electrical Characteristics (TC=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	-	18	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=16V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±10V,V_{DS}=0V	-	-	±10	μA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	0.45	0.7	1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V,I_D=20A	-	4	5.2	mΩ
		V_{GS}=2.5V,I_D=15A	-	5.2	6.7	mΩ
		V_{GS}=1.8V,I_D=10A	-	7.5	9	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=7.5A	-	90	-	S
Dynamic Characteristics (Note 4)						
Input Capacitance	C_{iss}	V_{DS}=10V,V_{GS}=0V, F=10KHz	-	2150	-	pF
Output Capacitance	C_{oss}		-	630	-	pF
Reverse Transfer Capacitance (Note 4)	C_{rss}		-	410	-	pF
Gate Resistance	R_g			0.8		KΩ
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=10V,R_L=1.35Ω, V_{GS}=5V,R_G=3Ω	-	7	-	nS
Turn-on Rise Time	t_r		-	8	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	70	-	nS
Turn-Off Fall Time	t_f		-	18	-	nS
Total Gate Charge	Q_g	V_{DS}=10V,I_D=20A, V_{GS}=4.5V	-	32	-	nC
Gate-Source Charge	Q_{gs}		-	2.8	-	nC
Gate-Drain Charge	Q_{gd}		-	9	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=1A	-	-	1.2	V
Maximum Body-Diode Continuous Current	I_S		-	-	36	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to product.

PE8240MA Typical Electrical and Thermal Characteristics

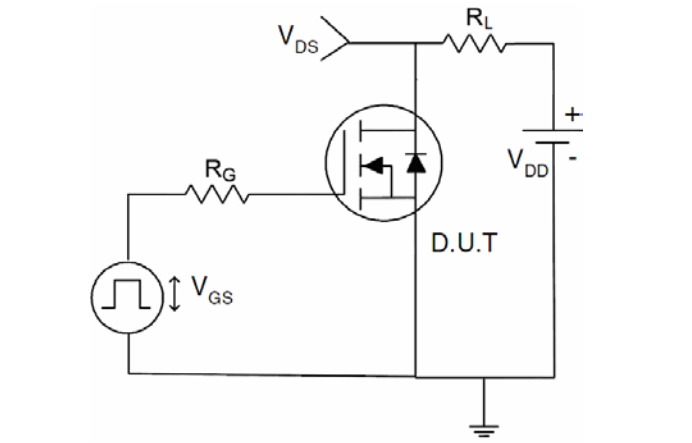


Figure 1 Switching Test Circuit

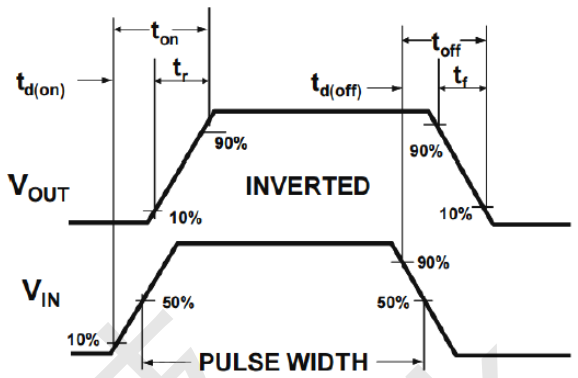


Figure 2 Switching Waveform

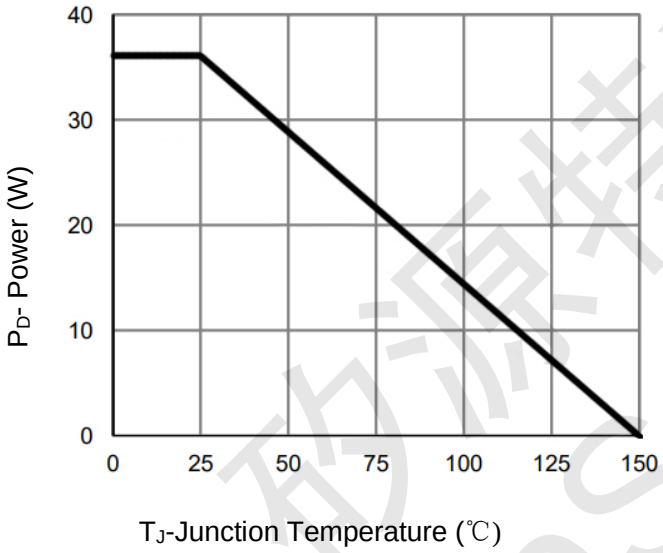


Figure 3 Power Dissipation

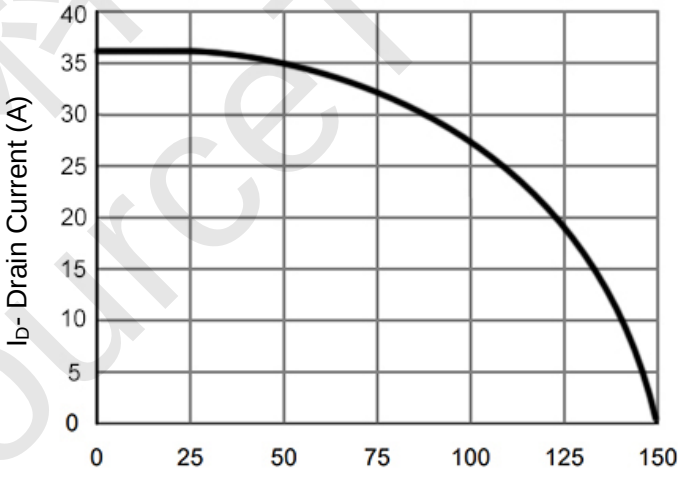


Figure 4 Drain Current

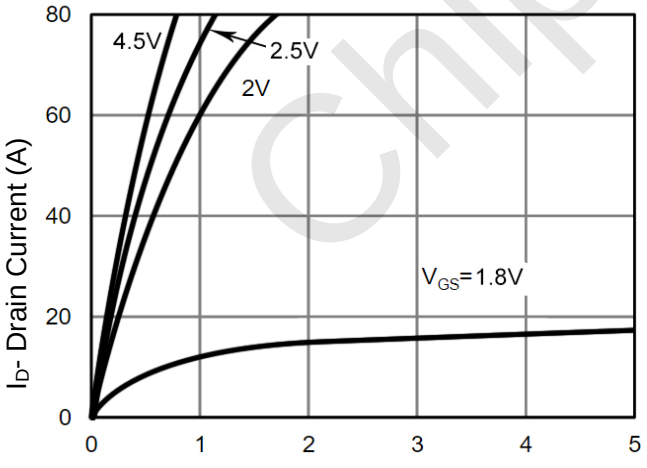


Figure 5 Output Characteristics

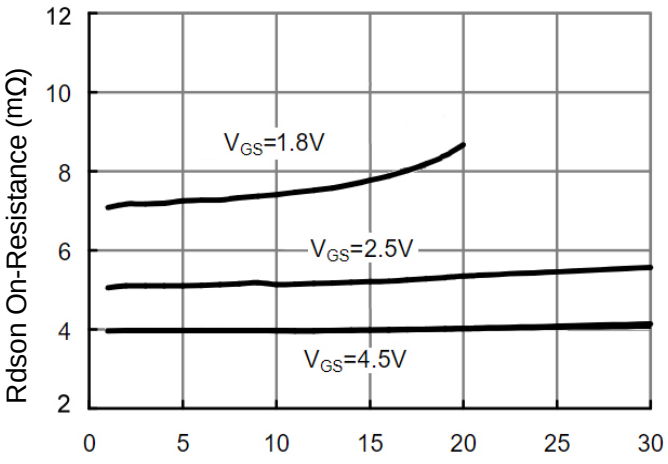


Figure 6 Rdson vs Drain Current

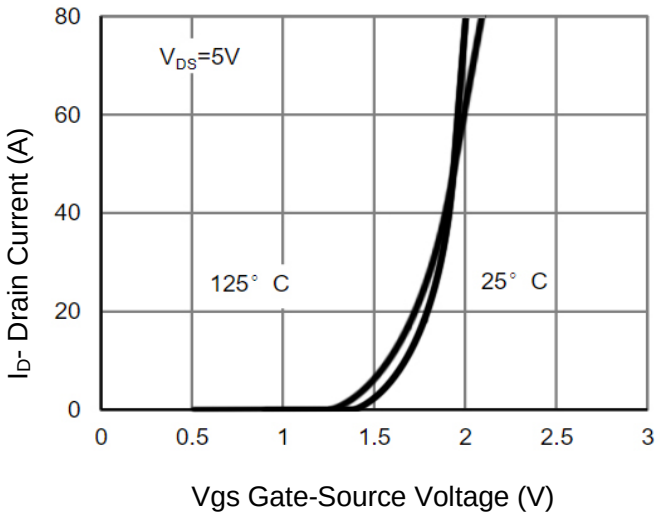


Figure 7 Transfer Characteristics

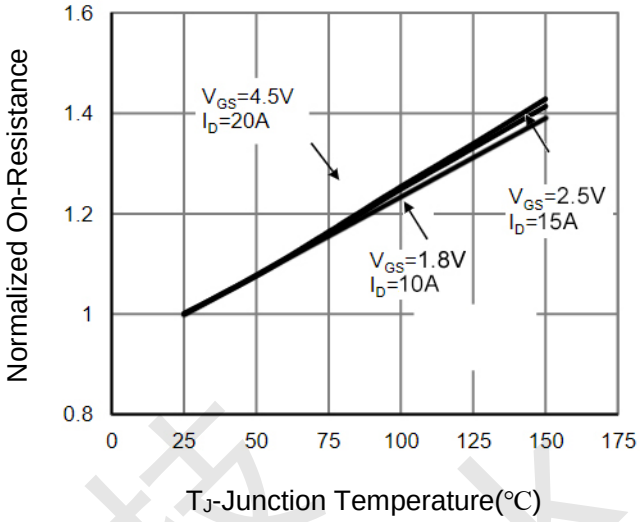


Figure 8 Rdson vs Junction Temperature

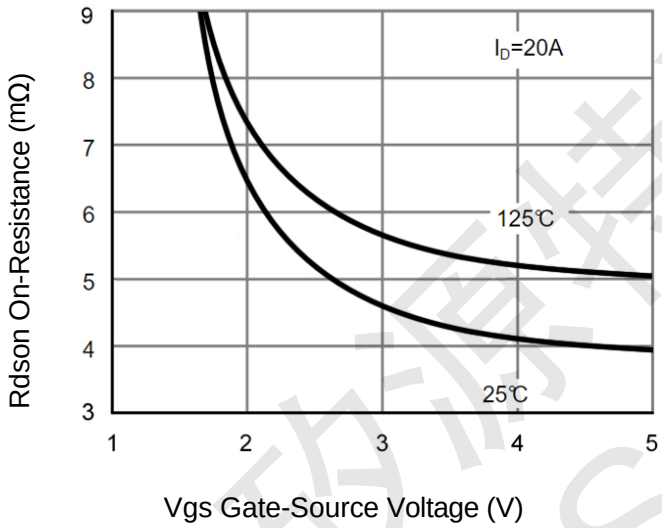


Figure 9 Rdson vs Vgs

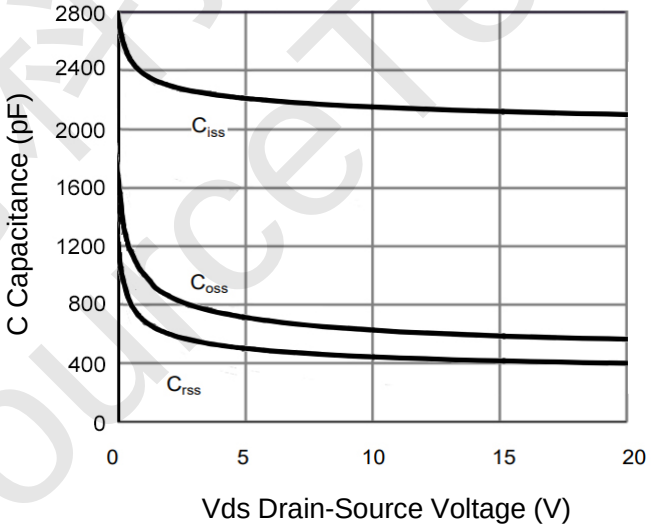


Figure 10 Capacitance vs Vds

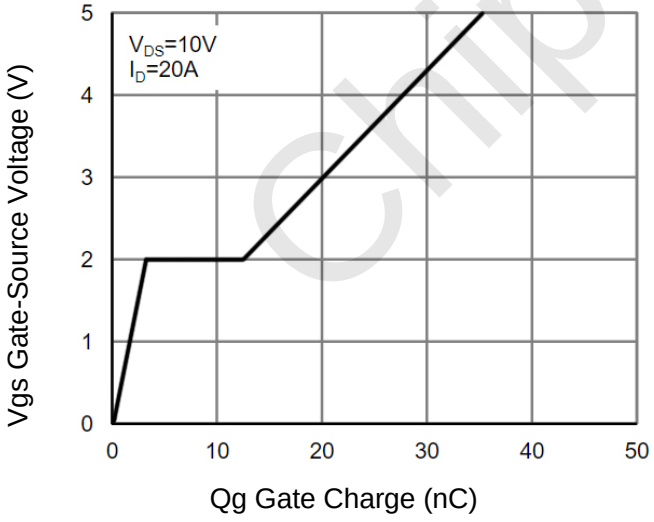


Figure 11 Gate Charge

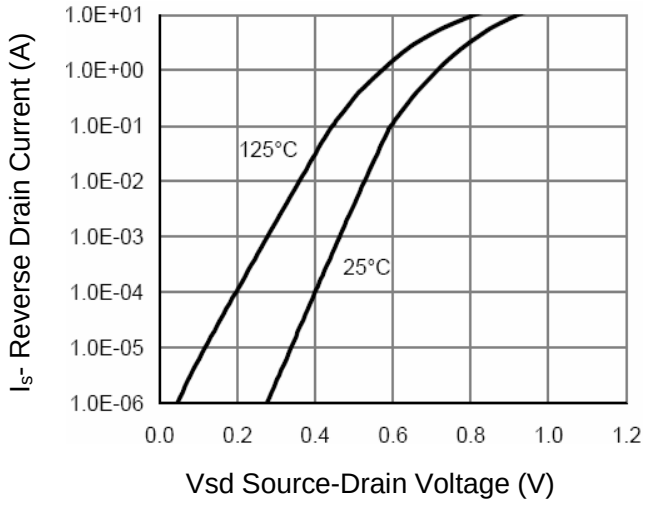


Figure 12 Source- Drain Diode Forward

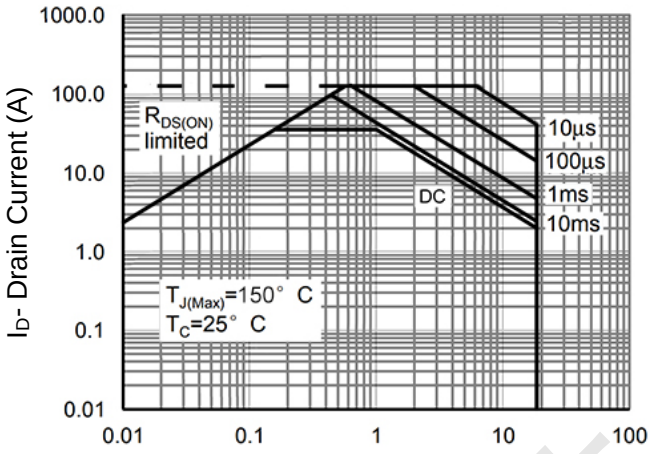


Figure 13 Safe Operation Area

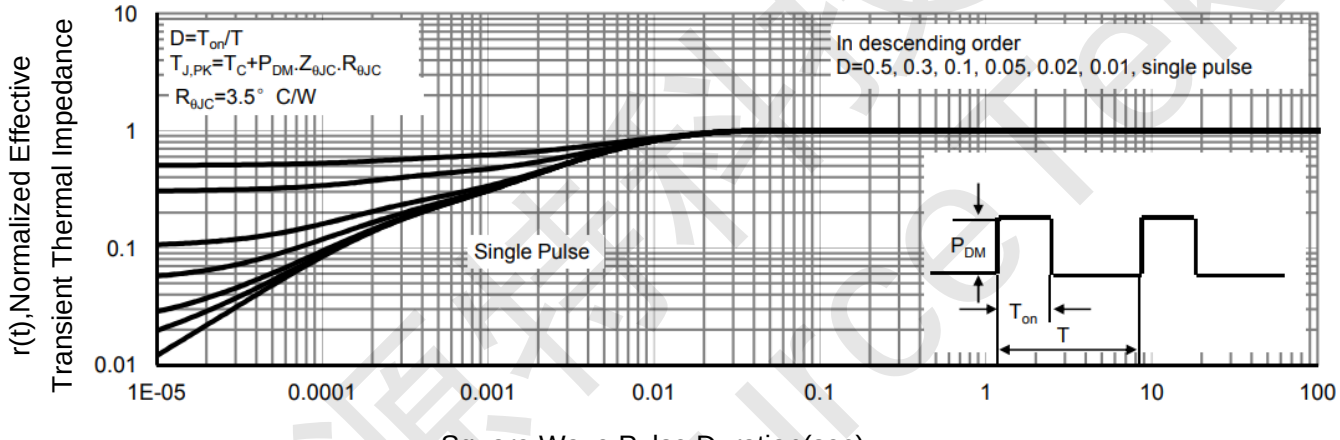
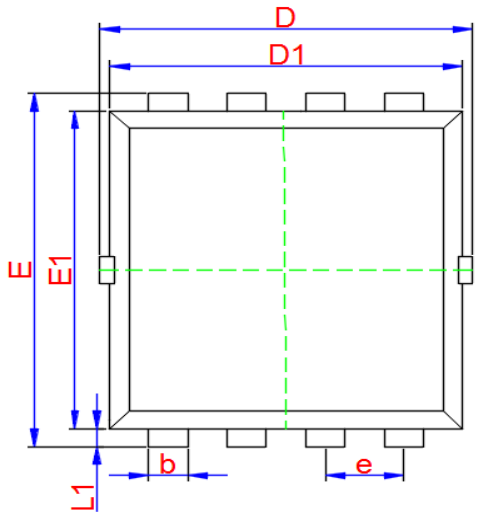
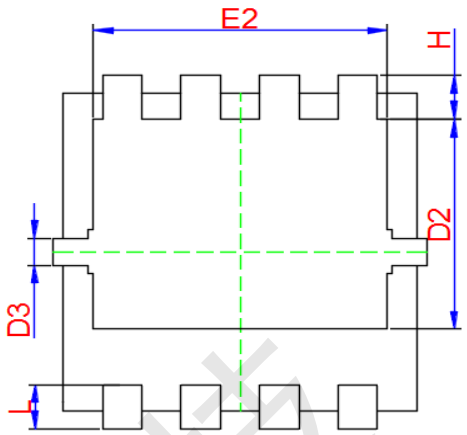
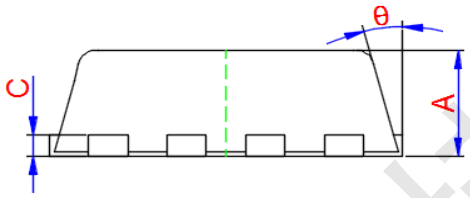


Figure 14 Normalized Maximum Transient Thermal Impedance

PE8240MA PDFN3.3x3.3-8L Package Information







Symbol	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	0.650	0.770	0.900
b	0.250	0.300	0.350
c	0.100	0.150	0.250
D	3.150	3.300	3.400
D1	2.950	3.100	3.200
D2	1.600	1.800	1.930
D3	-	0.130	-
E	3.050	3.300	3.450
E1	2.950	3.150	3.200
E2	2.300	2.400	2.550
e	0.650 TYP.		
H	0.330	0.430	0.530
L	0.300	0.400	0.500
L1	0.080	0.130	0.180
θ	-	10°	-