



PE8240MT N-Channel Enhancement Mode Power MOSFET

PE8240MT Description

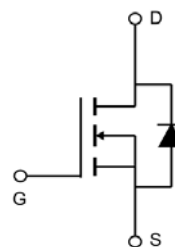
The PE8240MT uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. It can be used in a wide variety of applications.

PE8240MT General Features

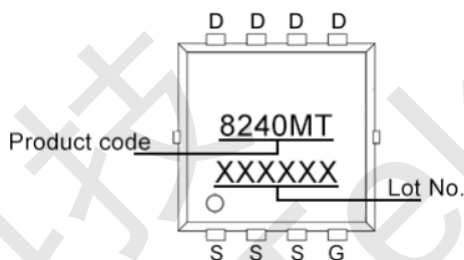
- $V_{DS} = 20V$, $I_D = 40A$
 $R_{DS(ON)} < 6m\Omega$ @ $V_{GS}=4.5V$
 $R_{DS(ON)} < 8m\Omega$ @ $V_{GS}=3.1V$
 $R_{DS(ON)} < 9m\Omega$ @ $V_{GS}=2.5V$
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

PE8240MT Application

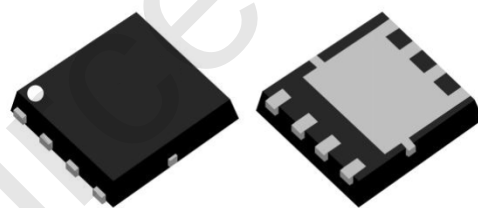
- PWM applications
- Load switch
- Power management
- Battery Protection



Schematic diagram



Marking and pin assignment



PDFN3.3x3.3-8L

PE8240MT Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current-Continuous	I_D	40	A
Drain Current-Continuous (TC=100°C)	I_D	32	A
Pulsed Drain Current (Note 1)	I_{DM}	160	A
Single Pulsed Avalanche Energy (L=0.1mH)	E_{AS}	58	mJ
Maximum Power Dissipation	P_D	36	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	°C

PE8240MT Thermal Characteristic

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.5	°C/W
Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	75	°C/W



PE8240MT Electrical Characteristics (TC=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$	-	-	1	μA
		$V_{DS}=18V, V_{GS}=0V$	-	-	200	nA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.45	0.7	1.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=15A$	-	4.8	6	m Ω
		$V_{GS}=3.1V, I_D=10A$	-	6	8	m Ω
		$V_{GS}=2.5V, I_D=5A$	-	7	9	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=15A$	-	105	-	S
Dynamic Characteristics (Note 4)						
Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V,$ $F=1MHz$	-	1580	-	pF
Output Capacitance	C_{oss}		-	464	-	pF
Reverse Transfer Capacitance	C_{rss}		-	242	-	pF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=10V, R_L=1.35\Omega,$ $V_{GS}=5V, R_G=3\Omega$	-	5	-	nS
Turn-on Rise Time	t_r		-	7	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	46	-	nS
Turn-Off Fall Time	t_f		-	11	-	nS
Total Gate Charge	Q_g	$V_{DS}=10V, I_D=15A,$ $V_{GS}=4.5V$	-	22	-	nC
Gate-Source Charge	Q_{gs}		-	2.8	-	nC
Gate-Drain Charge	Q_{gd}		-	6.6	-	nC
Drain-Source Diode Characteristics (Note 4)						
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=1A$	-	-	1.2	V
Maximum Body-Diode Continuous Current	I_S		-	-	40	A

Notes:

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



PE8240MT Typical Electrical and Thermal Characteristics

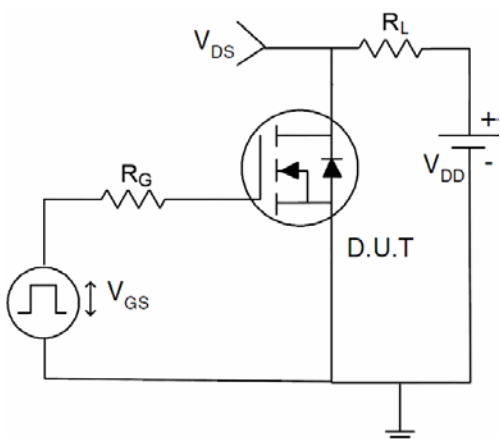


Figure 1 Switching Test Circuit

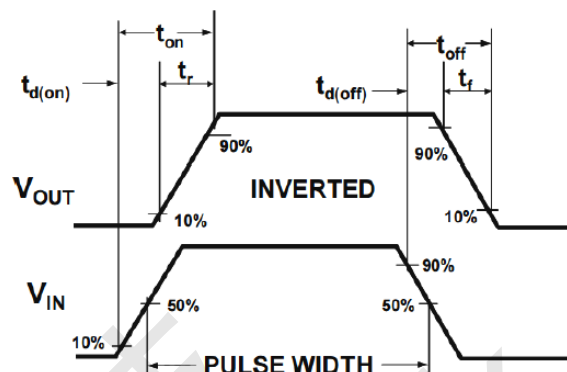


Figure 2 Switching Waveform

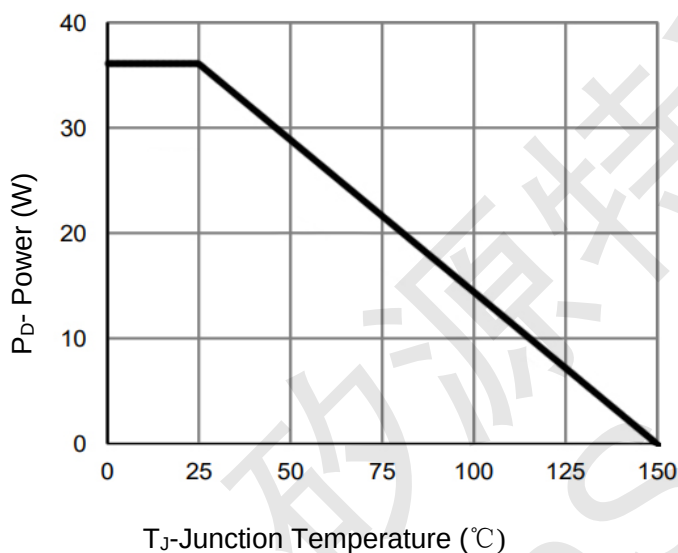


Figure 3 Power Dissipation

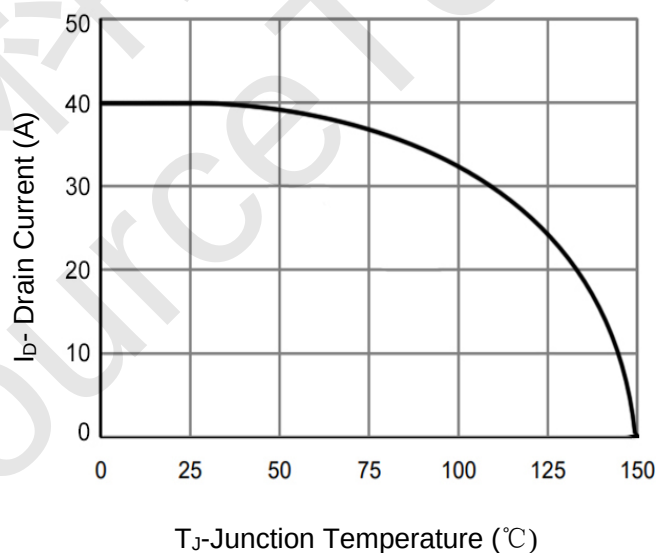


Figure 4 Drain Current

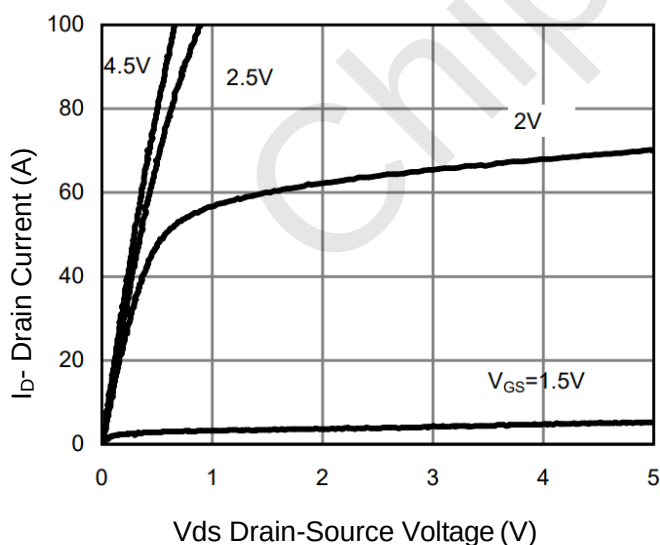


Figure 5 Output Characteristics

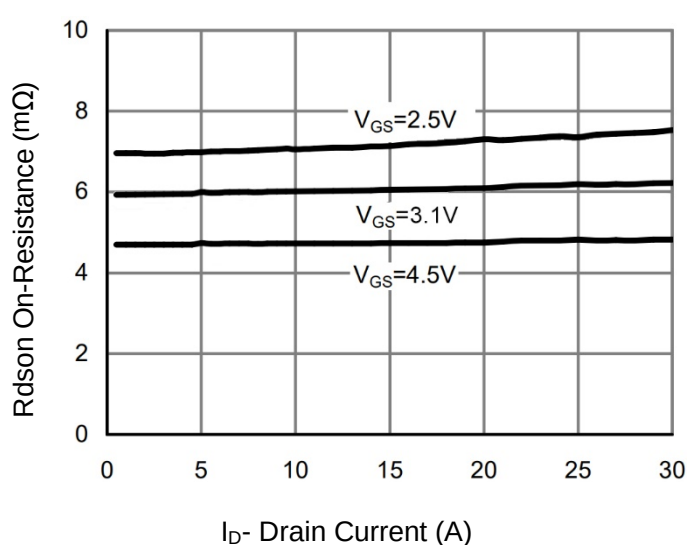


Figure 6 Rdson vs Drain Current

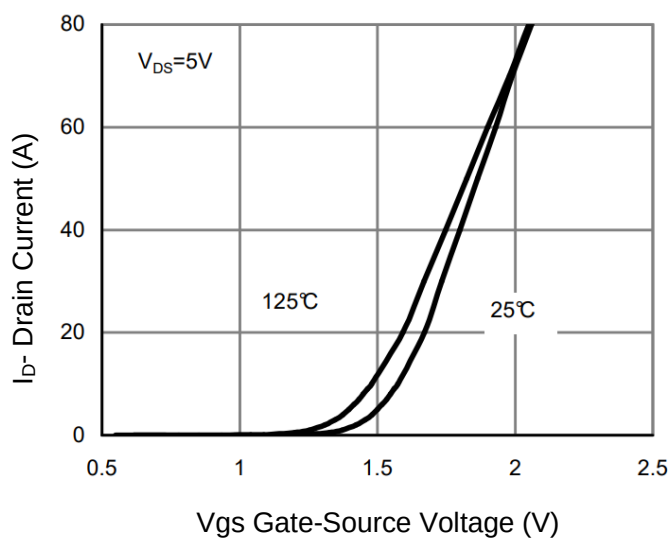


Figure 7 Transfer Characteristics

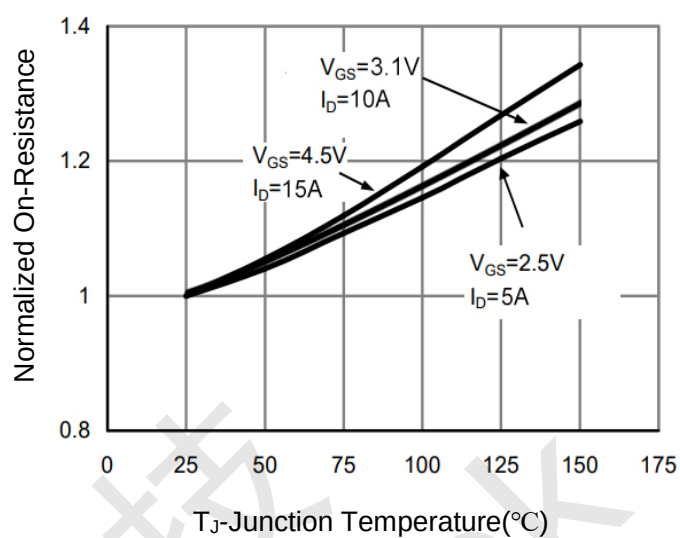


Figure 8 $R_{DS(on)}$ vs Junction Temperature

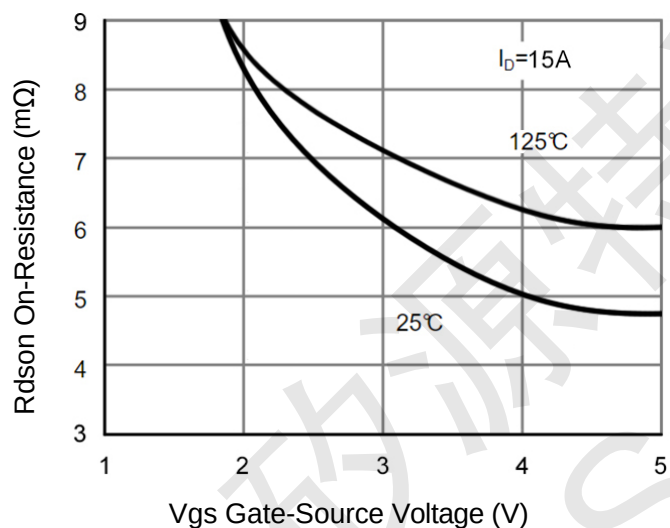


Figure 9 $R_{DS(on)}$ vs V_{GS}

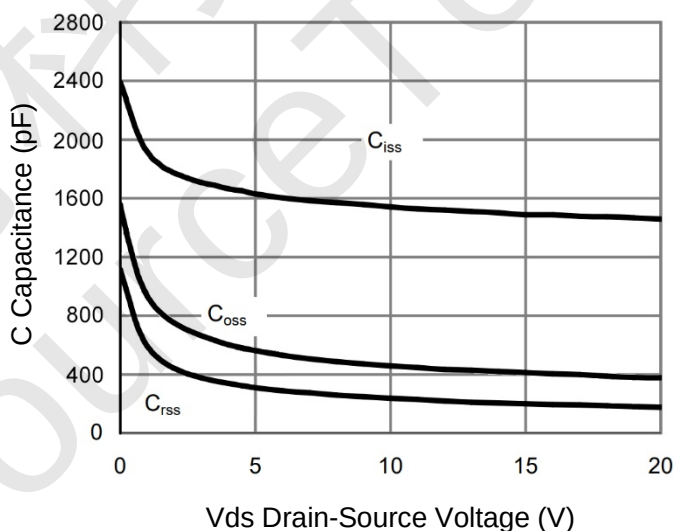


Figure 10 Capacitance vs V_{DS}

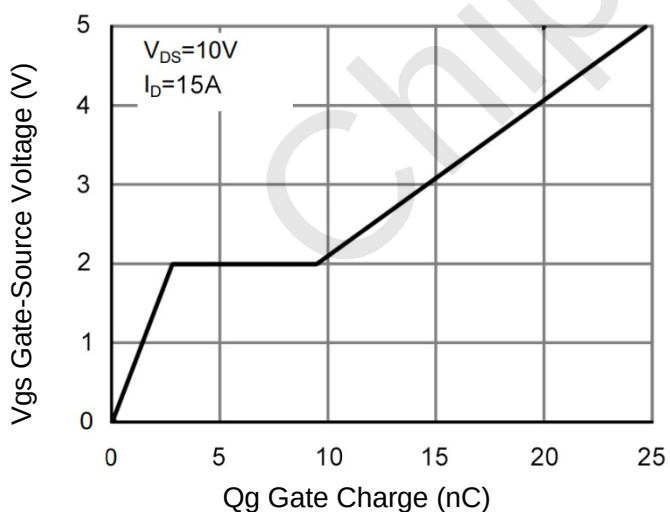


Figure 11 Gate Charge

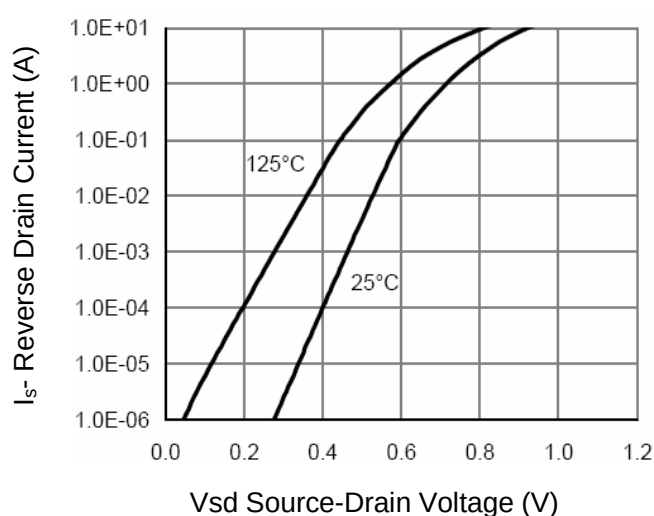


Figure 12 Source- Drain Diode Forward

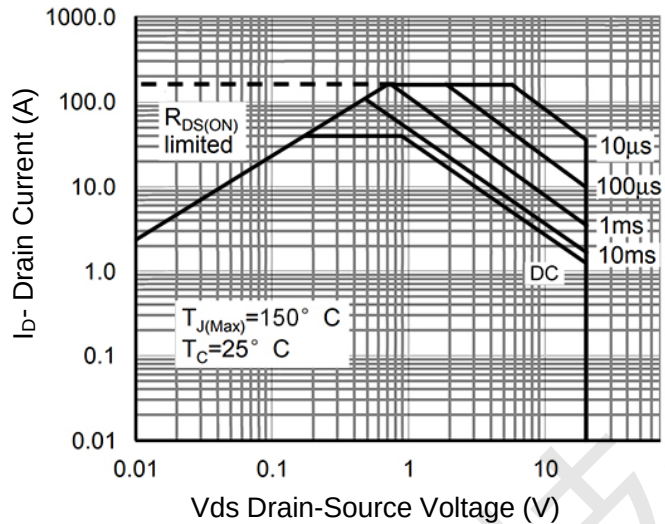


Figure 13 Safe Operation Area

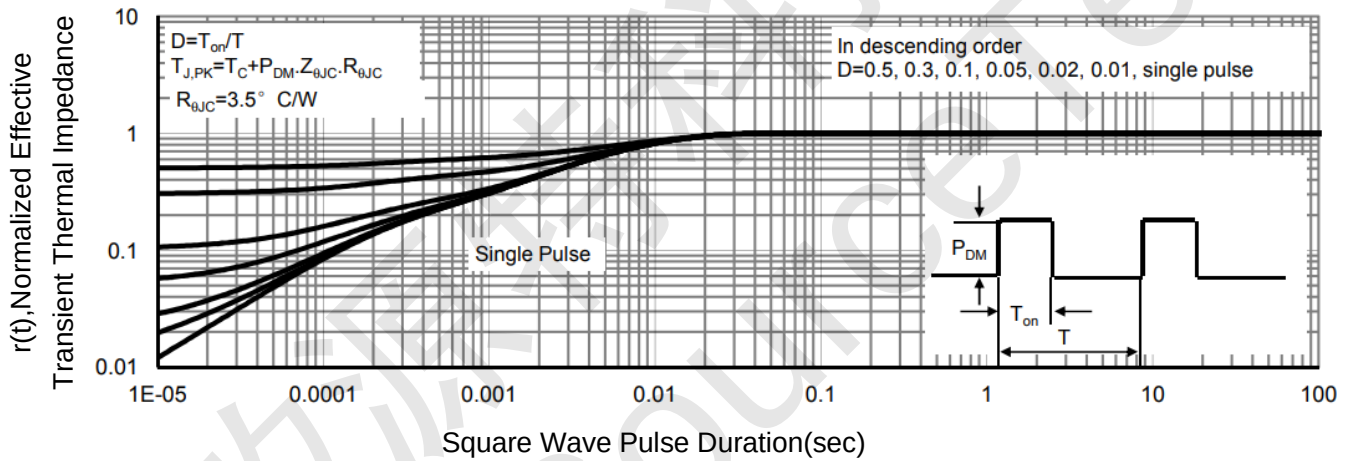
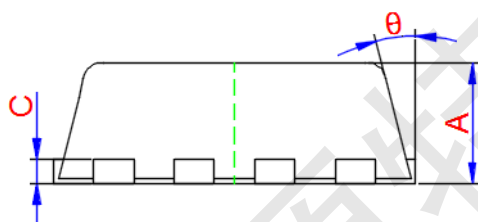
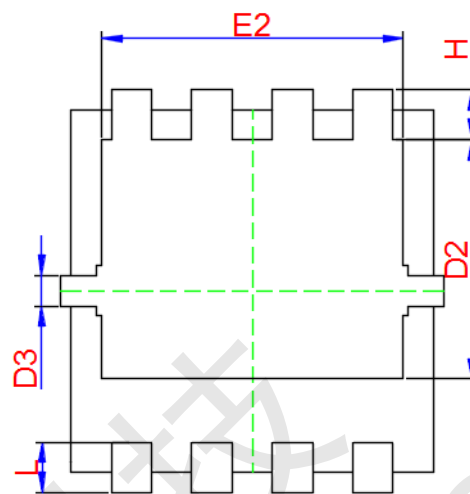
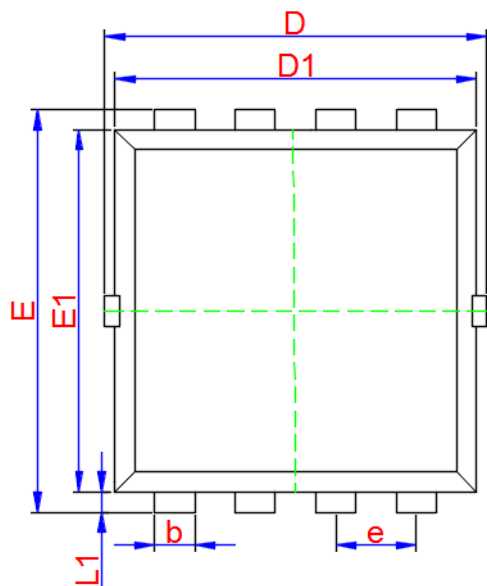


Figure 14 Normalized Maximum Transient Thermal Impedance



PE8240MT PDFN3.3x3.3-8L Package Information



Symbol	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	0.700	0.775	0.850
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	1.700	1.800	1.930
D3	-	0.130	-
E	3.050	3.250	3.350
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°	-