# P-Channel Enhancement Mode Power MOSFET

Description

The PE7208F uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. It can be used in a wide variety of applications.
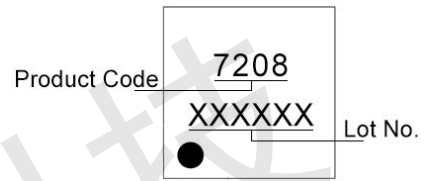
General Features

- V_{DS} = -20V, I_D = -8A

  $R_{DS(ON)}$ < 19mΩ @ V_{GS}=-4.5V
  $R_{DS(ON)}$ < 28mΩ @ V_{GS}=-2.5V

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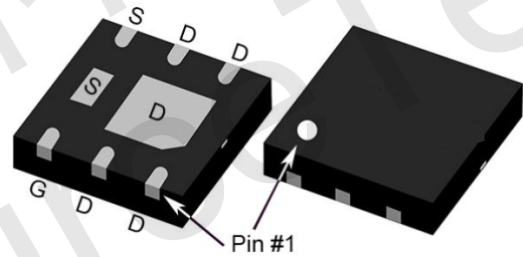- Lead free product is acquired
- Surface Mount Package

Application

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

Schematic diagram

Product Code   7208
XXXXXX   Lot No.
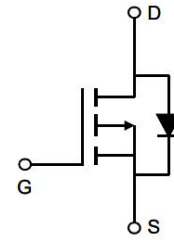
Marking and pin assignment

UDFN2x2-6L

Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous (TA=25℃)	I_D	-8	A
Drain Current-Continuous (TA=70℃)	I_D	-6	A
Pulsed Drain Current [Note 1]	I_{DM}	-30	A
Maximum Power Dissipation	P_D	2.8	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient [Note 2]	$R_{θJA}$	45	℃/W

Electrical Characteristics (TA=25℃ 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
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm12V, V_{DS}=0V$	-	-	±100	nA
On Characteristics [Note 3]						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	-0.7	-1.1	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-7A$	-	13.5	19	mΩ
		$V_{GS}=-2.5V, I_D=-6A$	-	20	28	mΩ
Forward Transconductance	g_{FS}	$V_{DS}=-5V, I_D=-8A$	-	33	-	S
Dynamic Characteristics [Note 4]						
Input Capacitance	C_{iss}	$V_{DS}=-10V, V_{GS}=0V,$ F=1.0MHz	-	2470	-	pF
Output Capacitance	C_{oss}		-	300	-	pF
Reverse Transfer Capacitance [Note 4]	C_{rss}		-	280	-	pF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=-10V, R_L=1\Omega,$ $V_{GS}=-10V, R_G=3\Omega$	-	11	-	nS
Turn-on Rise Time	t_r		-	6	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	28	-	nS
Turn-Off Fall Time	t_f		-	10	-	nS
Total Gate Charge	Q_g	$V_{DS}=-10V, I_D=-8A,$ $V_{GS}=-4.5V$	-	21	-	nC
Gate-Source Charge	Q_{gs}		-	4.5	-	nC
Gate-Drain Charge	Q_{gd}		-	7	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage [Note 3]	V_{SD}	$V_{GS}=0V, I_S=-1A$	-	-	-1.2	V
Diode Forward Current [Note 2]	I_S		-	-	-4	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.
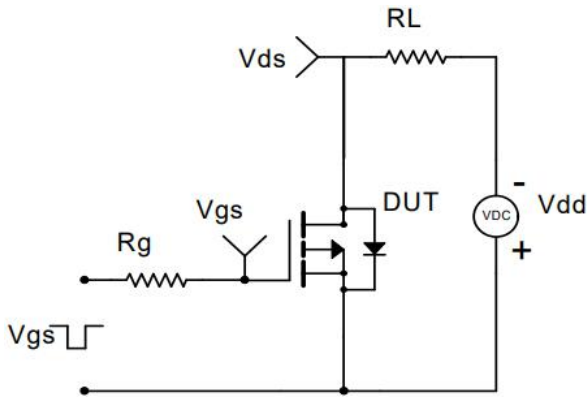
Typical Electrical and Thermal Characteristics

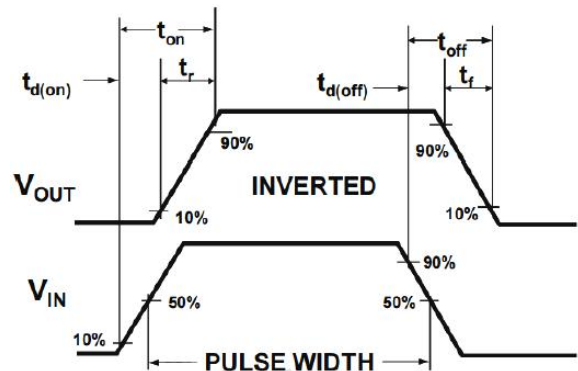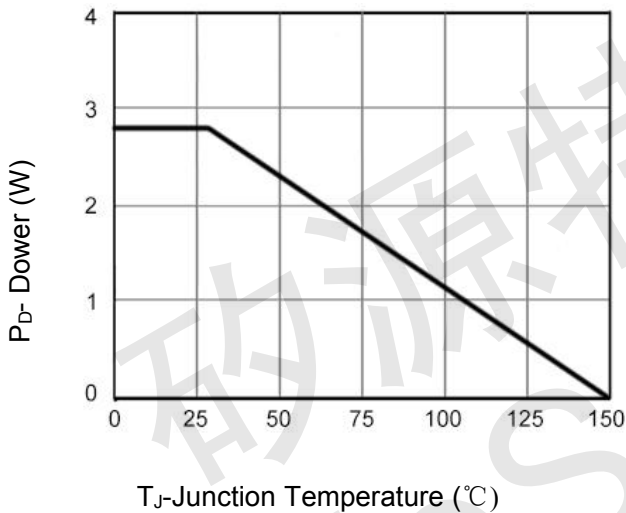**Figure 1 Switching Test Circuit**

Figure 2 Switching Waveform
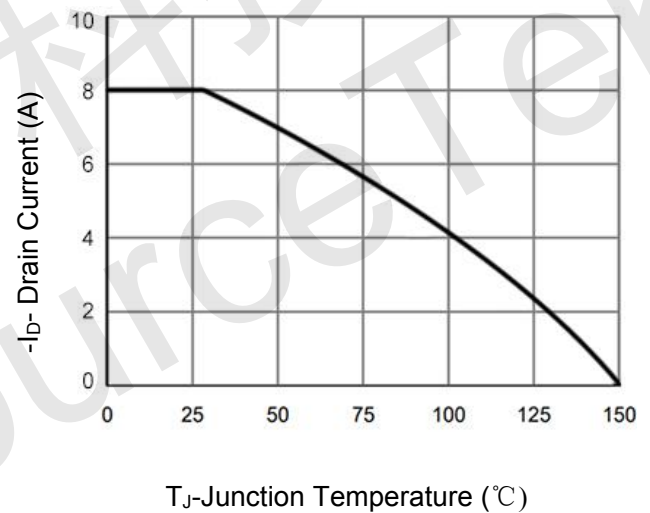

Figure 3 Power De-rating
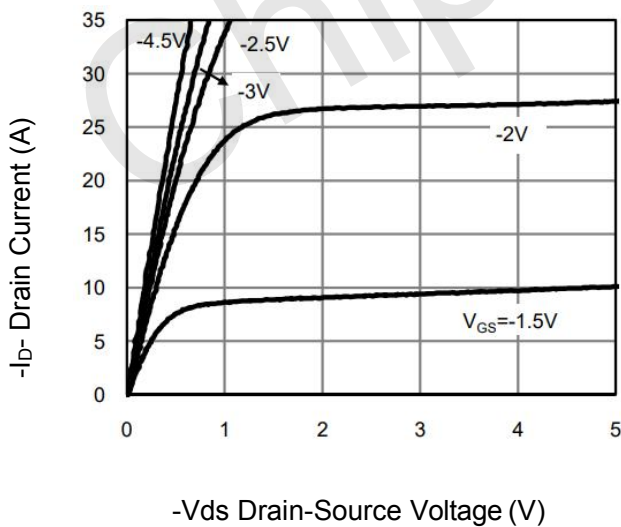

Figure 4 Drain Current
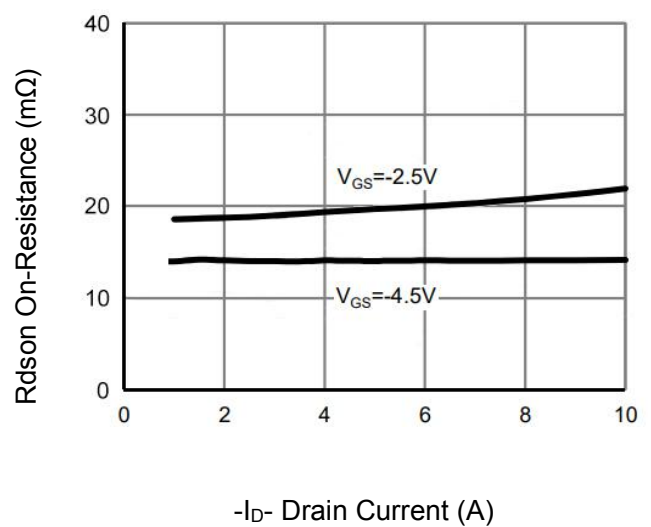

Figure 5 Output Characteristics

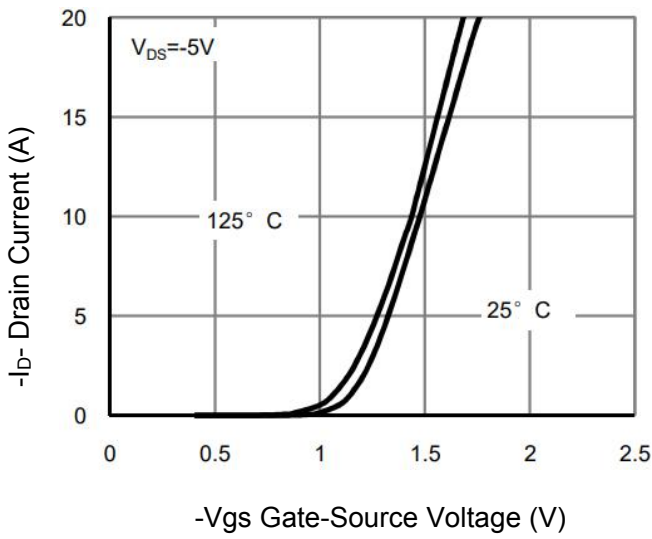**Figure 6 Rdson vs Drain Current**
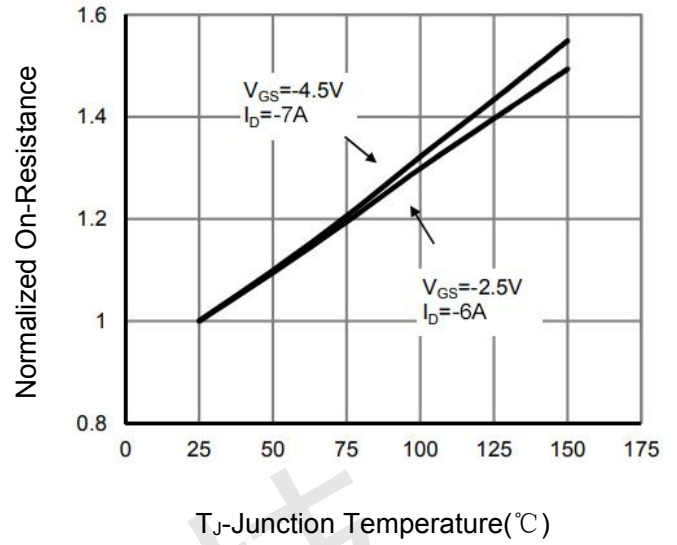
Figure 7 Transfer Characteristics
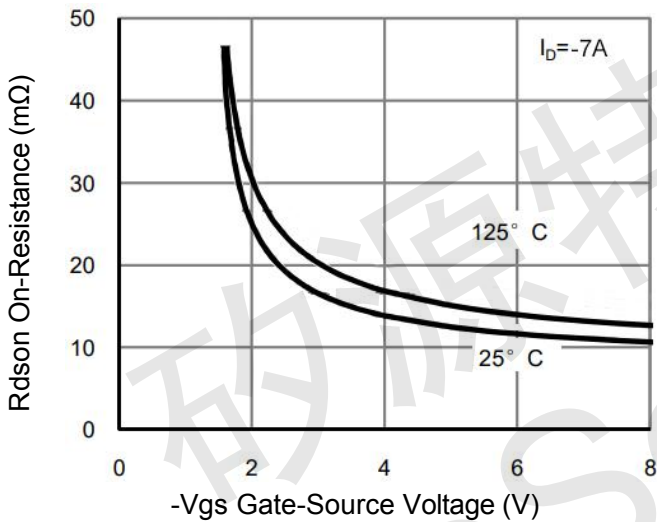
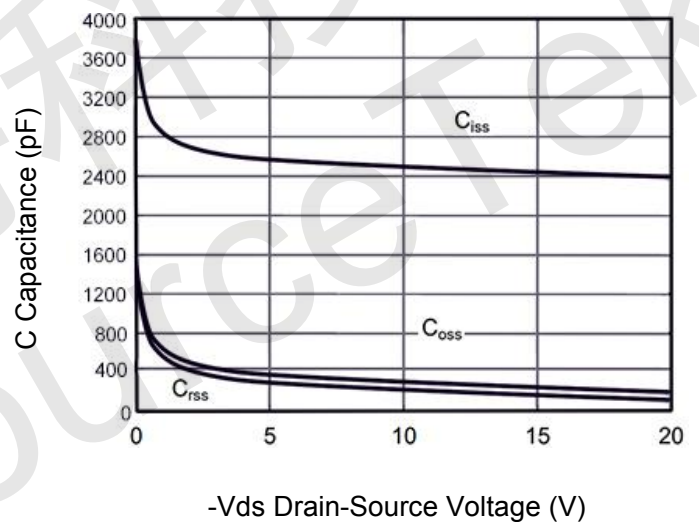**Figure 8 Rdson vs Junction Temperature**

Figure 9 Rdson vs Vgs

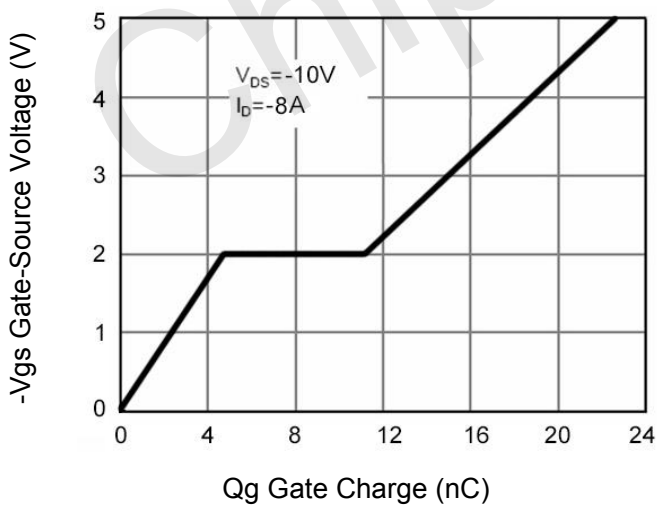**Figure 10 Capacitance vs Vds**
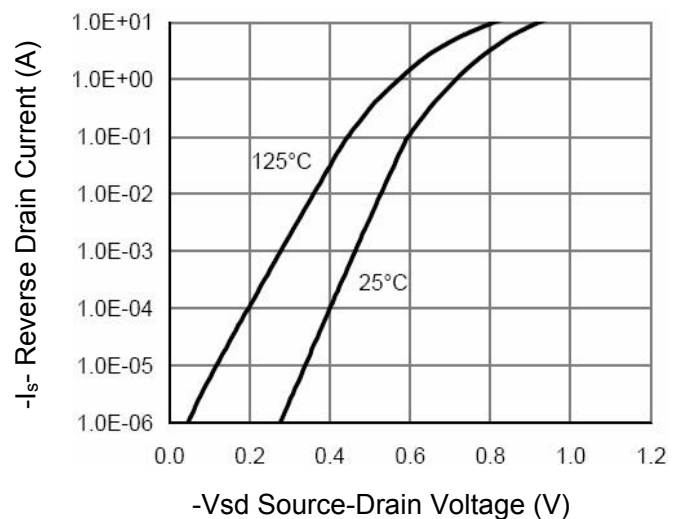
Figure 11 Gate Charge

Figure 12 Source- Drain Diode Forward

Figure 13 Safe Operation Area
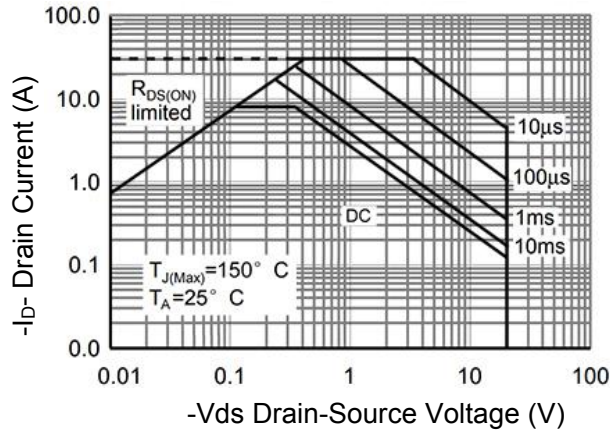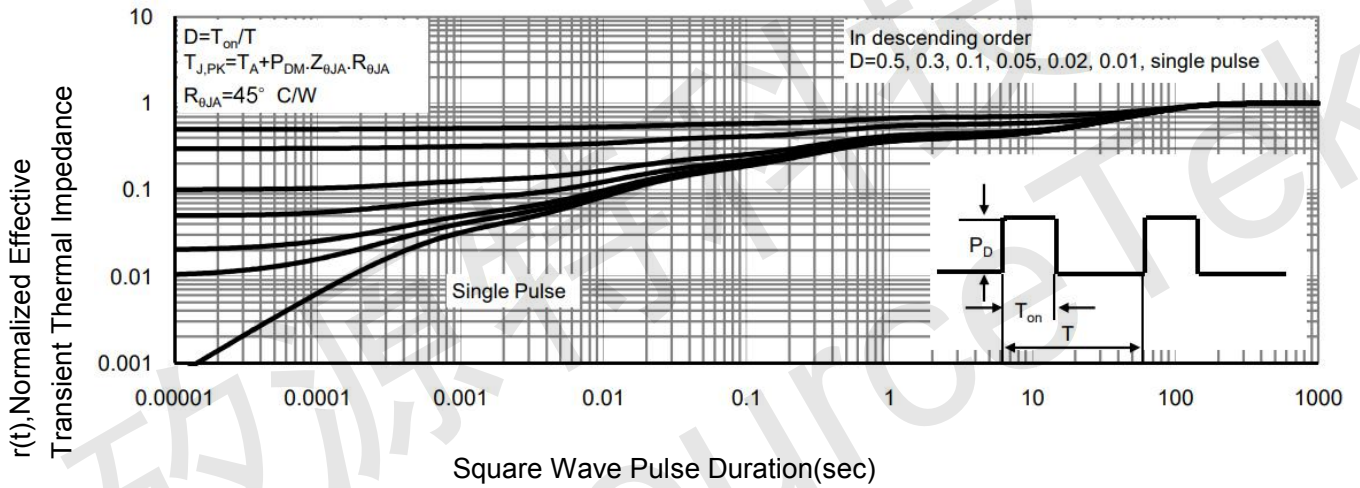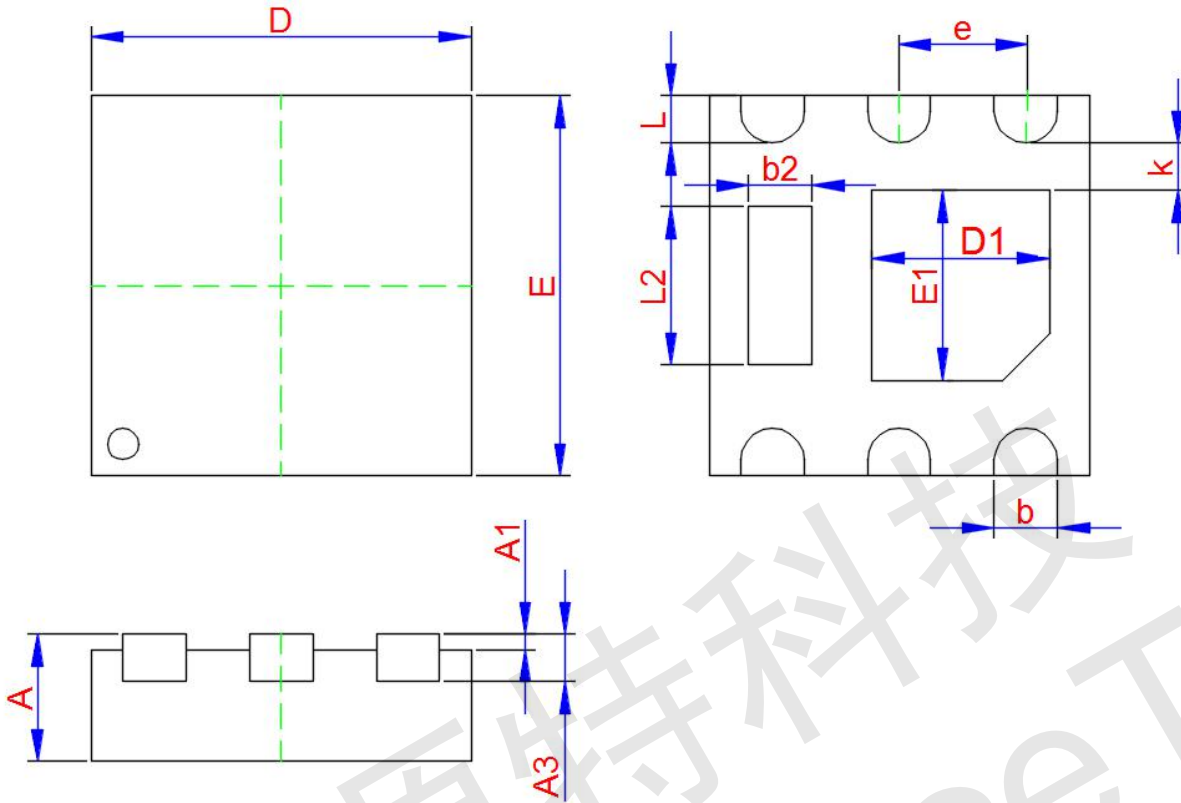

Square Wave Pulse Duration(sec)

Figure 14 Normalized Maximum Transient Thermal Impedance

UDFN2x2-6L Package Information

Symbol	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	0.450	0.500	0.550
A1	0.000	-	0.050
A3	0.120	0.150	0.190
D	1.950	2.000	2.050
E	1.950	2.000	2.050
D1	0.970	1.000	1.030
E1	0.970	1.000	1.030
b	0.250	0.300	0.350
L	0.200	0.250	0.300
b2	0.250	0.300	0.350
L2	0.750	0.800	0.850
k	0.250MIN.		
e	0.650TYP.		