Features

★ 100V, 75A
  $R_{DS(ON)} < 9.2m\Omega$ @ $V_{GS} = 10V$
  $R_{DS(ON)} < 13.5m\Omega$ @ $V_{GS} = 4.5V$

★ Advanced Split Gate Trench Technology
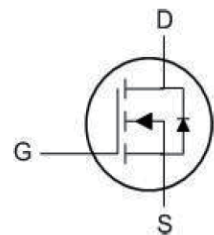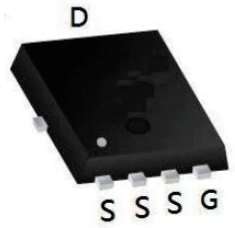★ Excellent $R_{DS(ON)}$ and Low Gate Charge
★ Lead free product is acquired

Description

★ Load Switch
★ PWM Application
★ Power management

Product Summary

RoHS

BVDSS	RDSON	ID
100V	7.3mΩ	75A

PRPAK5X6 Pin Configuration

Absolute Maximum Ratings

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		100	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	$T_C = 25℃$	75	A
		$T_C = 100℃$	49	A
I_{DM}	Pulsed Drain Current note1		300	A
EAS	Single Pulsed Avalanche Energy note2		90	mJ
P_D	Power Dissipation	$T_C = 25℃$	97	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.3	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to 150	℃

Electrical Characteristics (T_J =25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250µA	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=100V, V_{GS}=0V,	-	-	1	µA
I_{GSS}	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}= ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250µA	1	1.6	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS}=10V, I_D=20A	-	7.3	9.2	mΩ
		V_{GS}=4.5V, I_D=8A	-	9	13.5	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=50V, V_{GS}=0V, f=1.0MHz	-	2046	-	pF
C_{oss}	Output Capacitance		-	865	-	pF
C_{rss}	Reverse Transfer Capacitance		-	25	-	pF
Q_g	Total Gate Charge	V_{DS}=50V, I_D=30A, V_{GS}=10V	-	39.4	-	nC
Q_{gs}	Gate-Source Charge		-	5.2	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	9.8	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=50V, I_D=25A, R_G=6Ω, V_{GS}=10V	-	20	-	ns
t_r	Turn-on Rise Time		-	5.2	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	49	-	ns
t_f	Turn-off Fall Time		-	12	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	75	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	300	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=30A	-	-	1	V
t_{rr}	Body Diode Reverse Recovery Time	T_J=25℃,	-	49	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	IF=12A,dI/dt=100A/µs	-	85	-	nC

Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T_J=25℃, V_{DD}=50V, V_G=10V, R_G=25Ω, L=0.5mH, IAS=19A
3. Pulse Test: Pulse Width≤300µs, Duty Cycle≤0.5%

Typical Electrical and Thermal Characteristics (Curves)
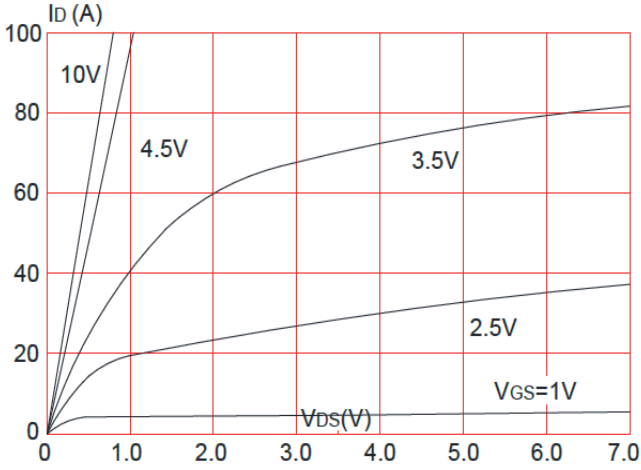
Figure1: Output Characteristics

I_D (A) vs V_{DS}(V); curves labeled 10V, 4.5V, 3.5V, 2.5V, V_{GS}=1V

Figure 2: Typical Transfer Characteristics

I_D (A) vs V_{GS}(V); curves labeled 125°C, 25°C
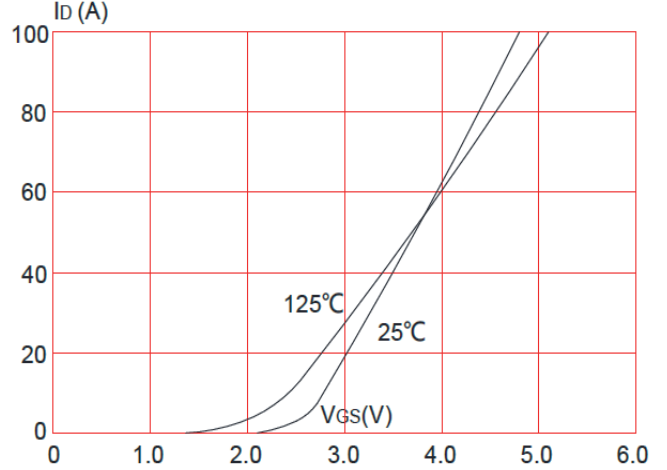
Figure 3:On-resistance vs. Drain Current

$R_{DS(ON)}$ (mΩ) vs I_D(A); curves labeled V_{GS}=4.5V, V_{GS}=10V
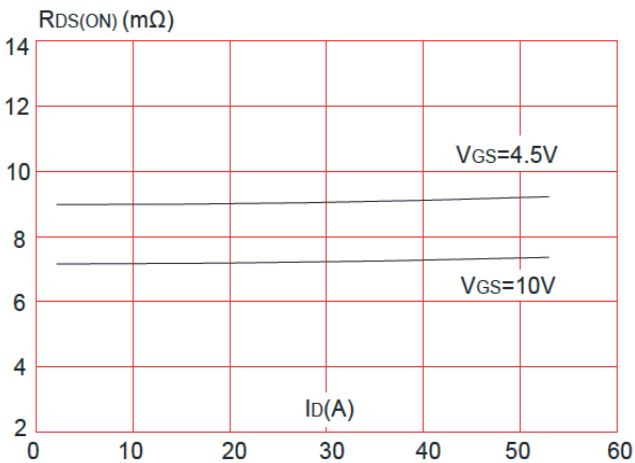
Figure 4: Body Diode Characteristics

I_S(A) vs V_{SD}(V); curves labeled 125°C, 25°C
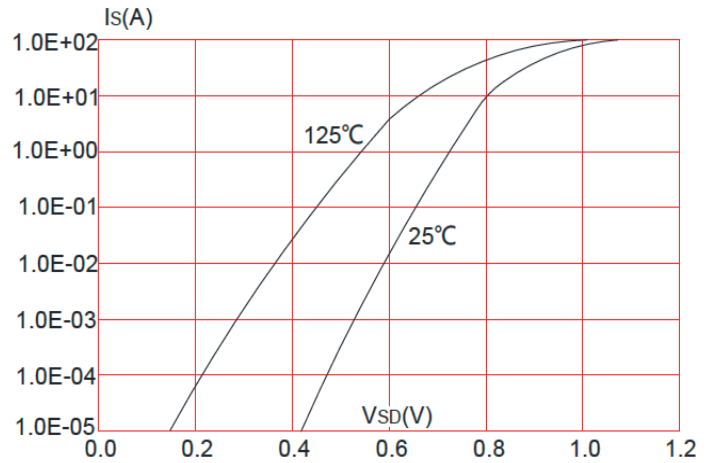
Figure 5: Gate Charge Characteristics

V_{GS}(V) vs Q_g(nC); V_{DS}=50V, I_D=30A
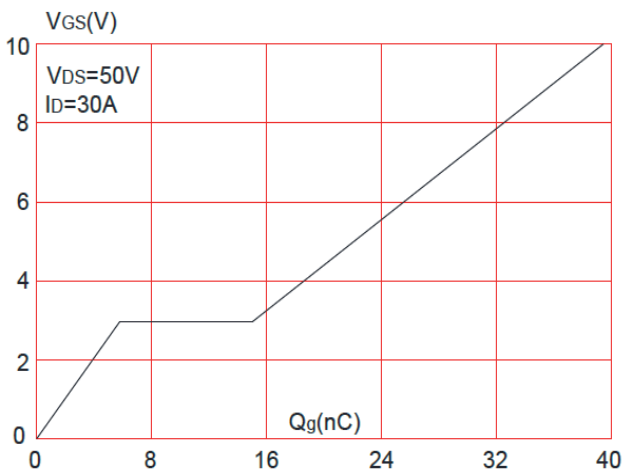
Figure 6:Capacitance Characteristics

C(pF) vs V_{DS}(V); curves labeled C_{iss}, C_{oss}, C_{rss}
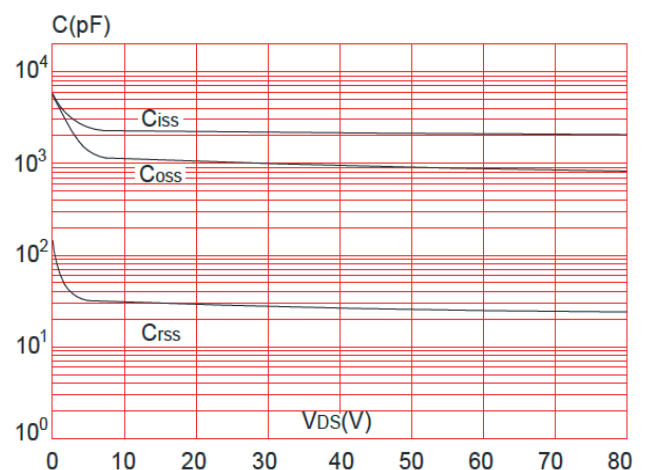
Typical Performance Characteristics

Figure 7:Normalized Breakdown Voltage vs. Junction Temperature

$V_{BR(DSS)}$

Tj (℃)
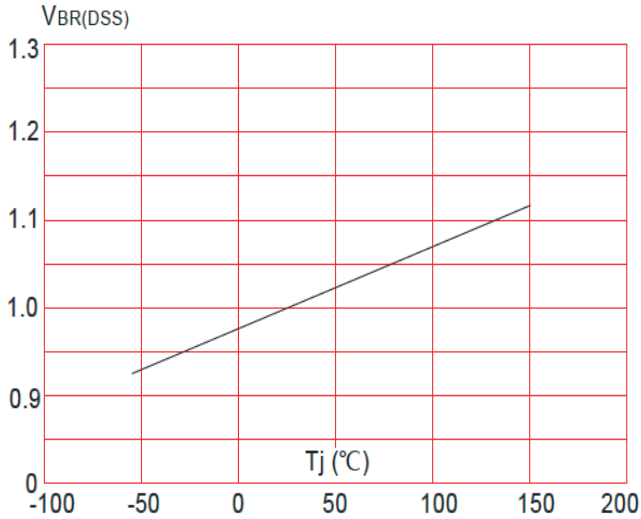
Figure 8: Normalized on Resistance vs. Junction Temperature

$R_{DS}(on)$

Tj (℃)
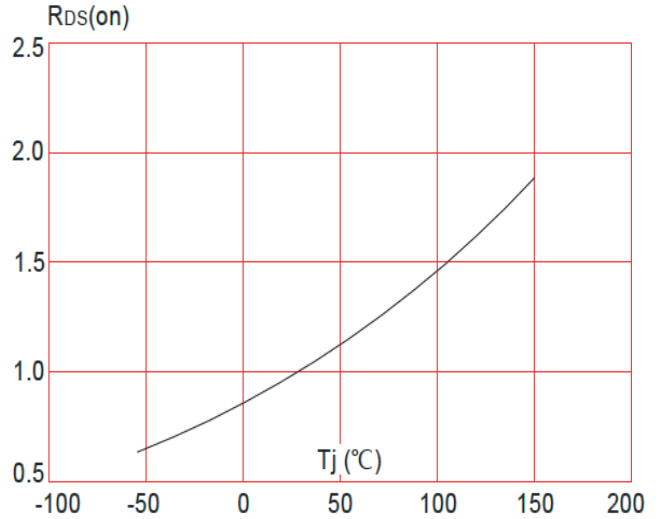
Figure 9:Maximum Safe Operating Area

$I_D(A)$

Limited by $R_{DS(on)}$

10μs
100μs
1ms
10ms
100ms
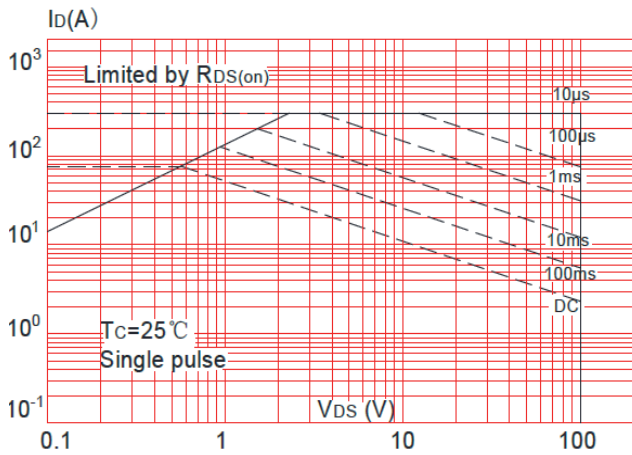DC

T_C=25℃
Single pulse

V_{DS} (V)

Figure 10: Maximum Continuous Drain Current vs. Case Temperature

$I_D(A)$

Tc (℃)
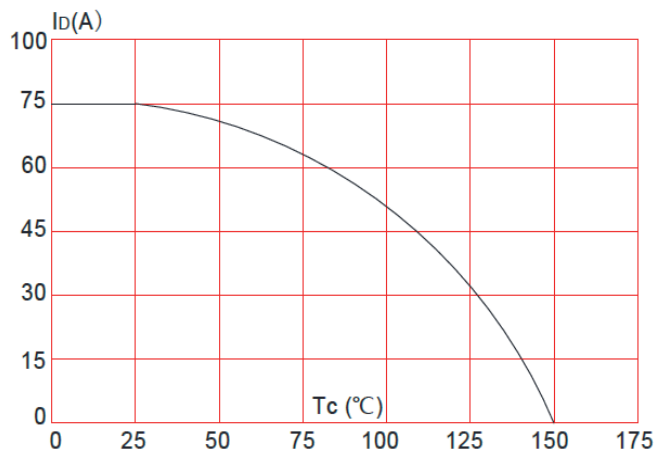
Figure 11 Maximum Effective Transient Thermal Impedance, Junction to Case

Zth_{J-C}(℃/W)

D=0.5
D=0.2
D=0.1
D=0.05
D=0.02
D=0.01
Single pulse

P_{DM}

t1
t2

Notes:
1.Duty factor D=t1/t2
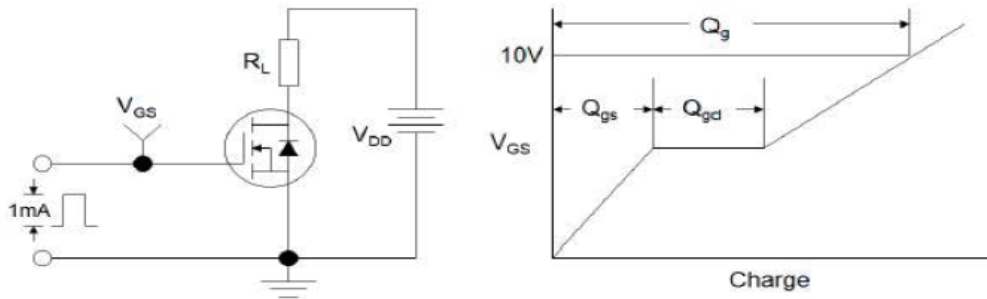2.Peak $T_J=P_{DM}*Zth_{JC}+T_C$
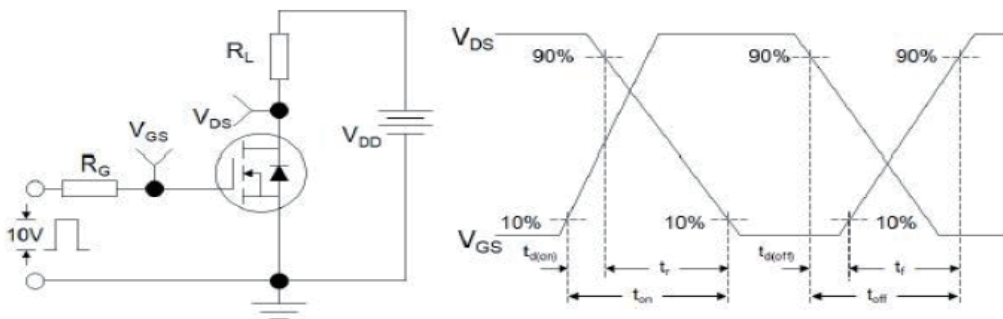
T_P(s)
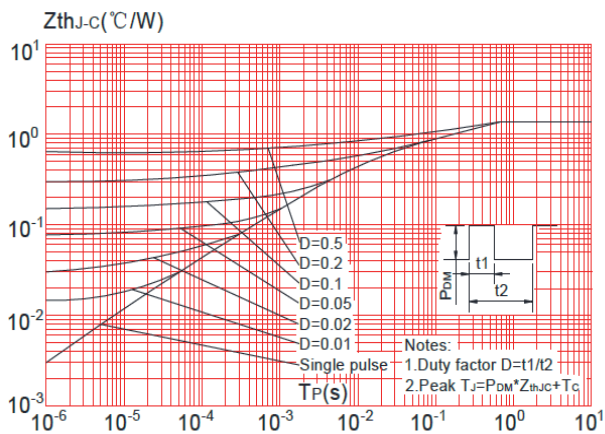
Test Circuit

Figure1:Gate Charge Test Circuit & Waveform

Figure 2: Resistive Switching Test Circuit & Waveforms

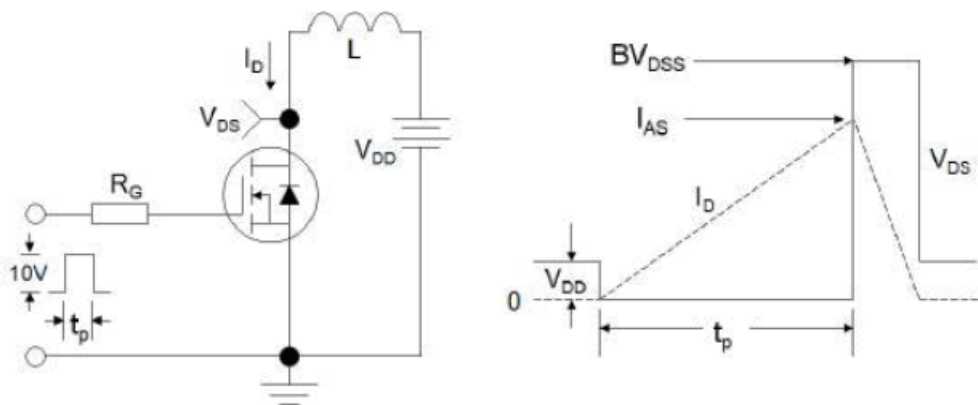Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

Package Mechanical Data- PDFN5x6-8L
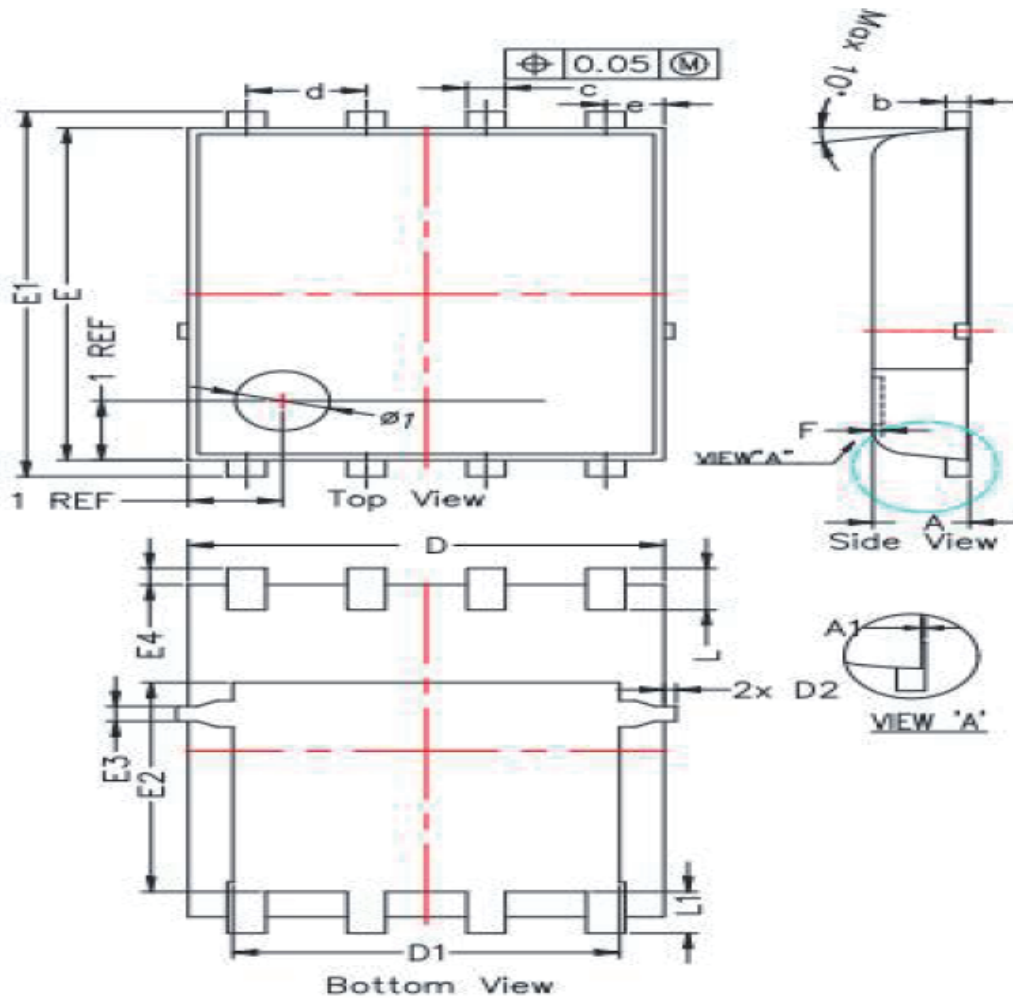
SYMBOLS	DIMENSION IN MM			DIMENSION IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
* A	0.900	1.000	1.100	0.035	0.039	0.043
A1	0.000	---	0.050	0.000	----	0.002
b	0.246	0.254	0.312	0.010	0.010	0.012
* c	0.310	0.410	0.510	0.012	0.016	0.020
d	1.27 BSC			0.050 BSC		
* D	4.950	5.050	5.150	0.195	0.199	0.203
D1	4.000	4.100	4.200	0.157	0.161	0.165
* D2	---	---	0.125	---	---	0.005
e	0.62 BSC			0.024 BSC		
* E	5.500	5.600	5.700	0.217	0.220	0.224
* E1	6.050	6.150	6.250	0.238	0.242	0.246
E2	3.425	3.525	3.625	0.135	0.139	0.143
E3	0.150	0.250	0.350	0.006	0.010	0.014
* E4	0.175	0.275	0.375	0.007	0.011	0.015
F	-	-	0.100	-	-	0.004
* L	0.500	0.600	0.700	0.02	0.02	0.03
L1	0.600	0.700	0.800	0.02	0.03	0.03