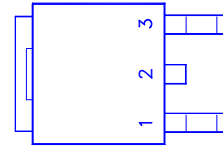
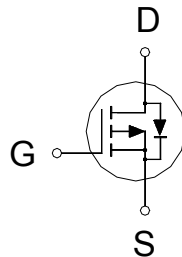


**PRODUCT SUMMARY**

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$
-40V	25.8mΩ	-18A



- 1. GATE
- 2. DRAIN
- 3. SOURCE

**100% UIS tested  
100% Rg tested**

**ABSOLUTE MAXIMUM RATINGS ( $T_C = 25\text{ }^\circ\text{C}$  Unless Otherwise Noted)**

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		$V_{DS}$	-40	V
Gate-Source Voltage		$V_{GS}$	±20	V
Continuous Drain Current	$T_C = 25\text{ }^\circ\text{C}$	$I_D$	-18	A
	$T_C = 70\text{ }^\circ\text{C}$		-13.5	
Pulsed Drain Current <sup>1</sup>		$I_{DM}$	-40	
Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	$P_D$	42	W
	$T_C = 70\text{ }^\circ\text{C}$		27	
Operating Junction & Storage Temperature Range		$T_J, T_{stg}$	-55 to 150	°C
Lead Temperature ( <sup>1</sup> / <sub>16</sub> " from case for 10 sec.)		$T_L$	275	

**THERMAL RESISTANCE RATINGS**

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		3	°C / W
Junction-to-Ambient	$R_{\theta JA}$		75	°C / W

<sup>1</sup>Pulse width limited by maximum junction temperature.

**ELECTRICAL CHARACTERISTICS ( $T_C = 25\text{ }^\circ\text{C}$ , Unless Otherwise Noted)**

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-40			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.5	-2.2	-3.0	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 20V$			±250	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -32V, V_{GS} = 0V$			1	μA
		$V_{DS} = -30V, V_{GS} = 0V, T_J = 125\text{ }^\circ\text{C}$			10	
On-State Drain Current <sup>1</sup>	$I_{D(ON)}$	$V_{DS} = -5V, V_{GS} = -10V$	-40			A

Drain-Source On-State Resistance <sup>1</sup>	$R_{DS(ON)}$	$V_{GS} = -7V, I_D = -10A$	30	40	mΩ
		$V_{GS} = -10V, I_D = -18A$	22	25.8	
Forward Transconductance <sup>1</sup>	$g_{fs}$	$V_{DS} = -5V, I_D = -18A$	20		S
<b>DYNAMIC</b>					
Input Capacitance	$C_{iss}$	$V_{GS} = 0V, V_{DS} = -15V, f = 1MHz$	1570		pF
Output Capacitance	$C_{oss}$		320		
Reverse Transfer Capacitance	$C_{rss}$		210		
Total Gate Charge <sup>2</sup>	$Q_g$	$V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = -10V, I_D = -18A$	29		nC
Gate-Source Charge <sup>2</sup>	$Q_{gs}$		6		
Gate-Drain Charge <sup>2</sup>	$Q_{gd}$		7		
Turn-On Delay Time <sup>2</sup>	$t_{d(on)}$	$V_{DS} = -20V, R_L = 1\Omega, I_D \cong -1A, V_{GS} = -10V, R_{GS} = 6\Omega$	12		nS
Rise Time <sup>2</sup>	$t_r$		29		
Turn-Off Delay Time <sup>2</sup>	$t_{d(off)}$		42		
Fall Time <sup>2</sup>	$t_f$		33		
<b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T<sub>C</sub> = 25 °C)</b>					
Continuous Current	$I_S$			-18	A
Forward Voltage <sup>1</sup>	$V_{SD}$	$I_F = I_S, V_{GS} = 0V$		-1.3	V
Reverse Recovery Time	$t_{rr}$	$I_F = -18A, di_F/dt = 100A / \mu S$	29		nS
Reverse Recovery Charge	$Q_{rr}$		21		nC

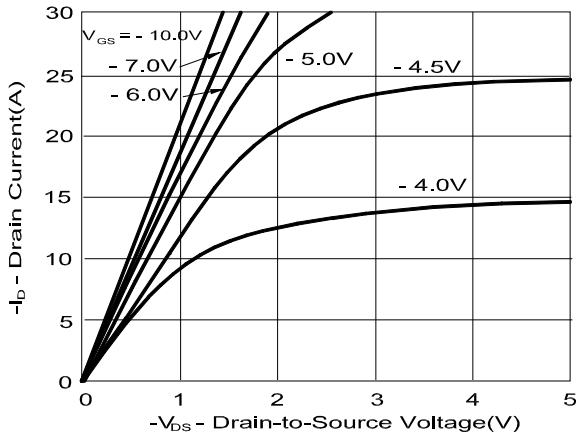
<sup>1</sup>Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

<sup>2</sup>Independent of operating temperature.

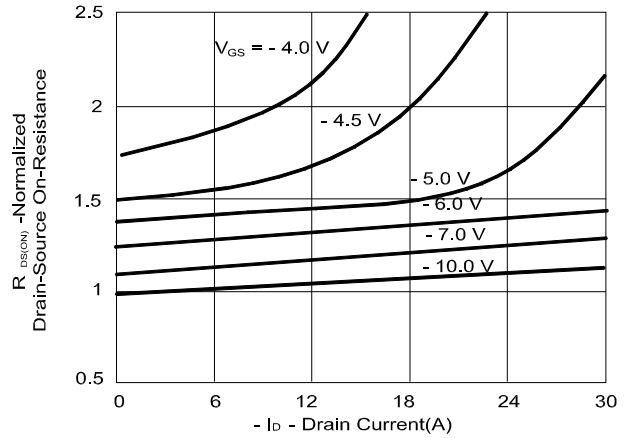
**REMARK: THE PRODUCT MARKED WITH “P2504EDG”, DATE CODE or LOT #**

**TYPICAL PERFORMANCE CHARACTERISTICS**

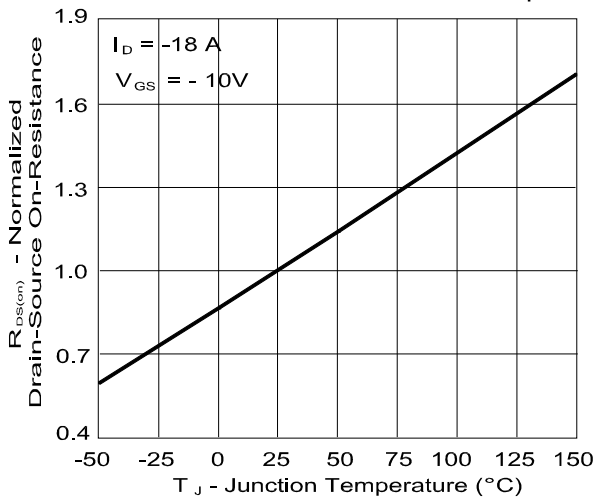
On-Region Characteristics



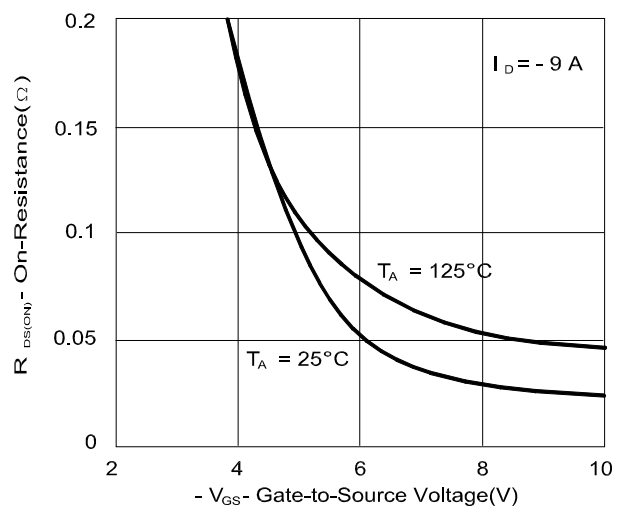
On-Resistance Variation with Drain Current and Gate Voltage



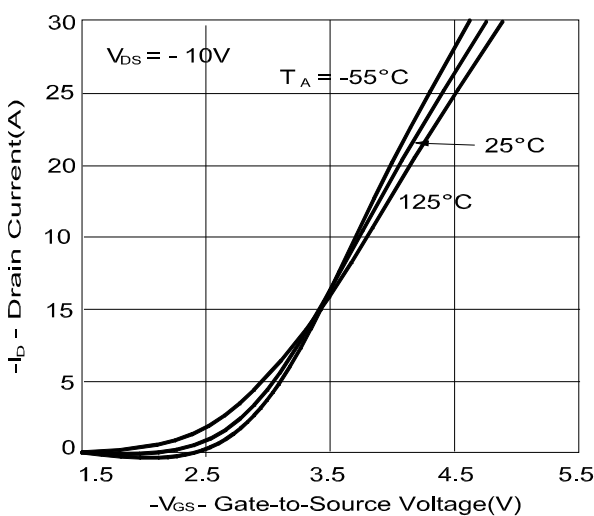
On-Resistance Variation with Temperature



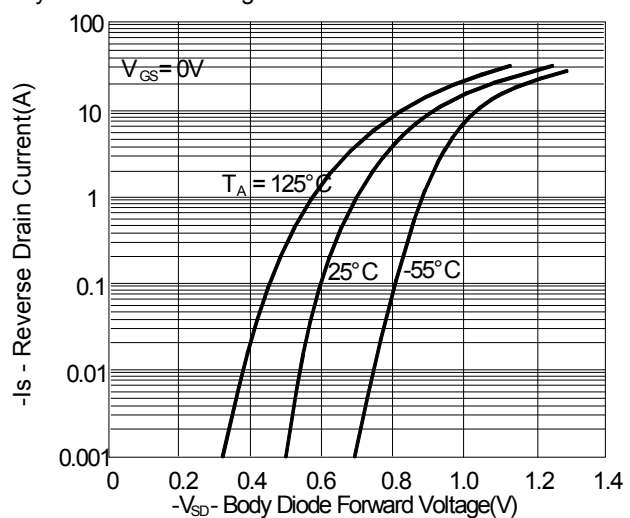
On-Resistance Variation with Gate-to-Source Voltage

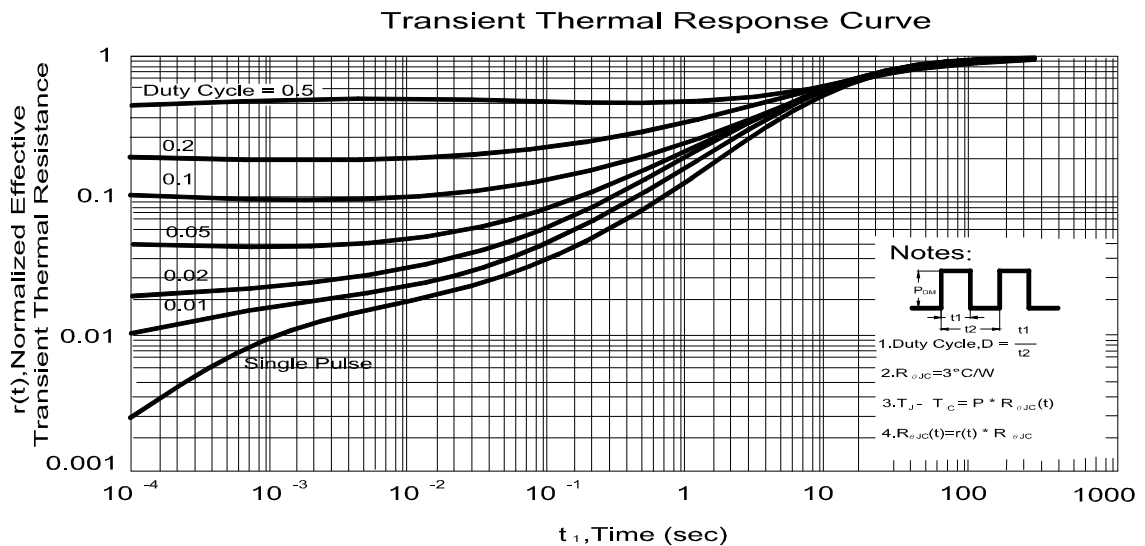
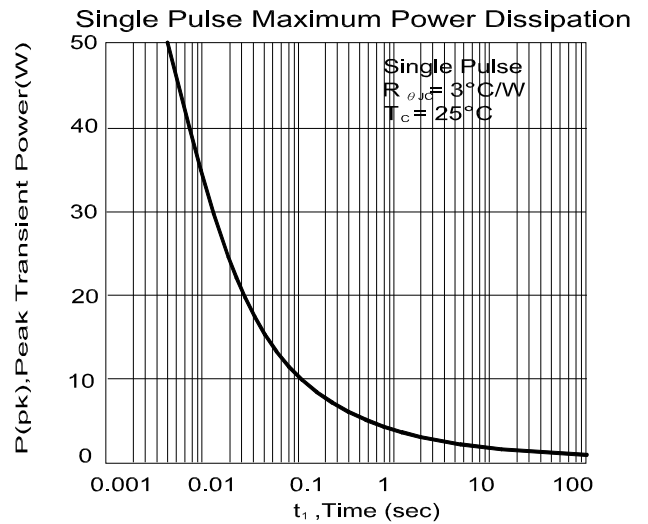
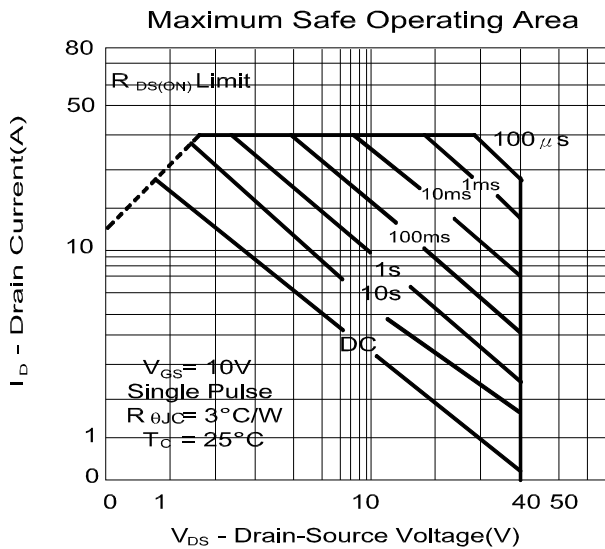
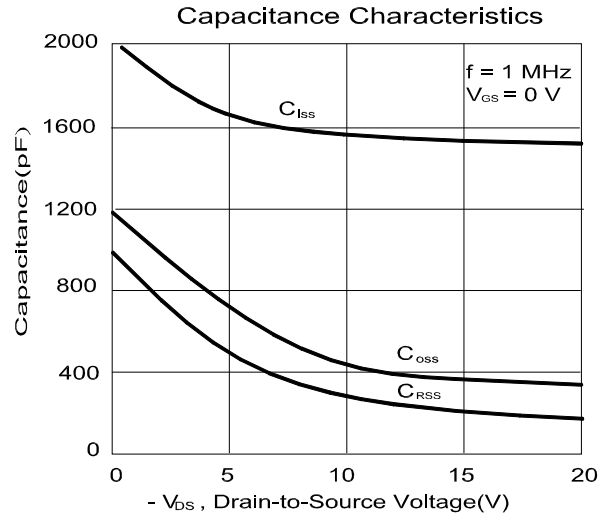
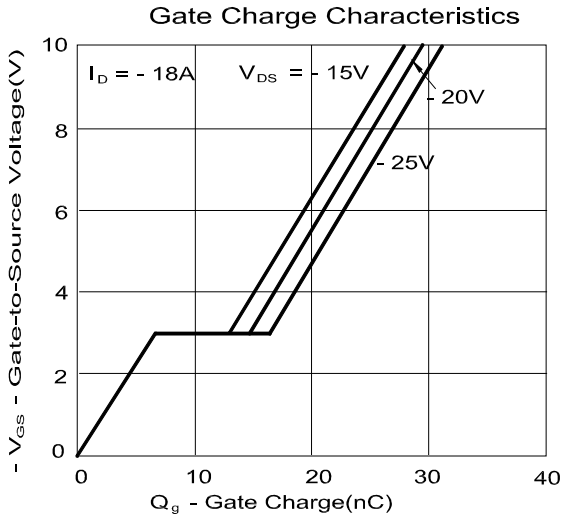


Transfer Characteristics



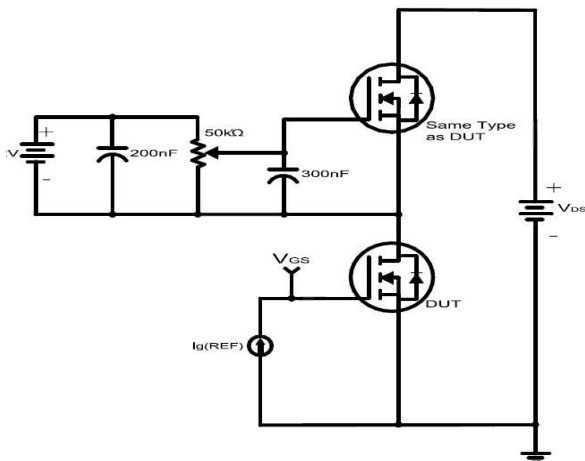
Body Diode Forward Voltage Variation with Source Current and Temperature





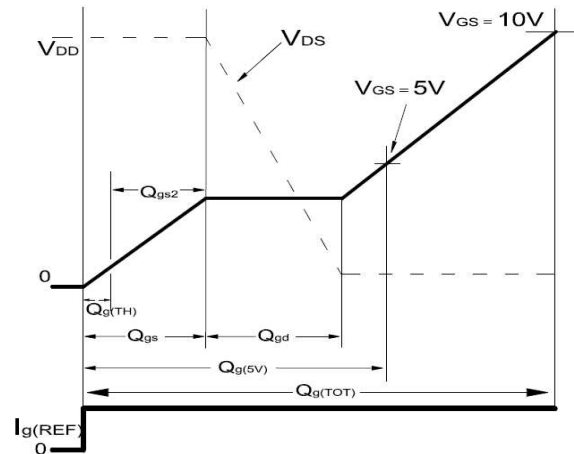
**Figure 1**

**Gate Charge Test Circuit**



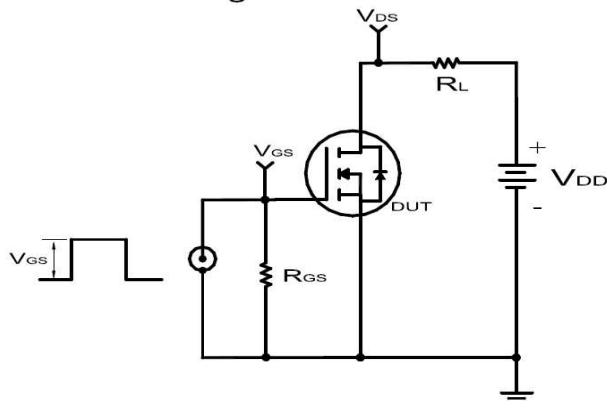
**Figure 2**

**Gate Charge Waveforms**



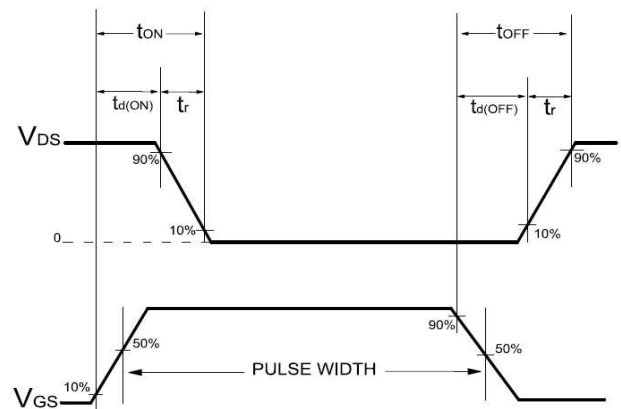
**Figure 3**

**Switching Time Test Circuit**



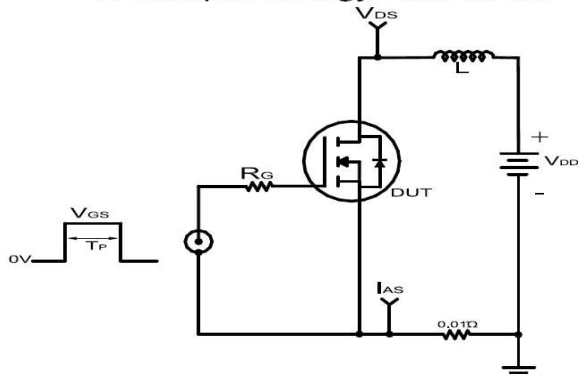
**Figure 4**

**Switching Time Waveforms**



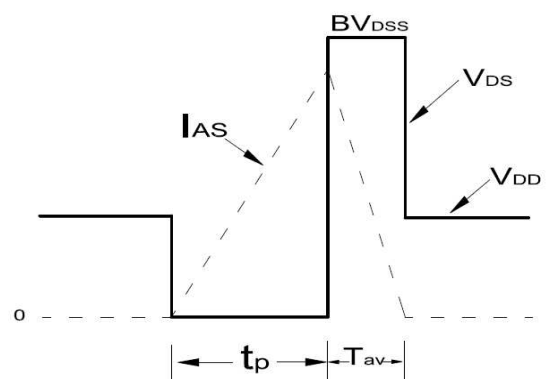
**Figure 5**

**Unclamped Energy Test Circuit**

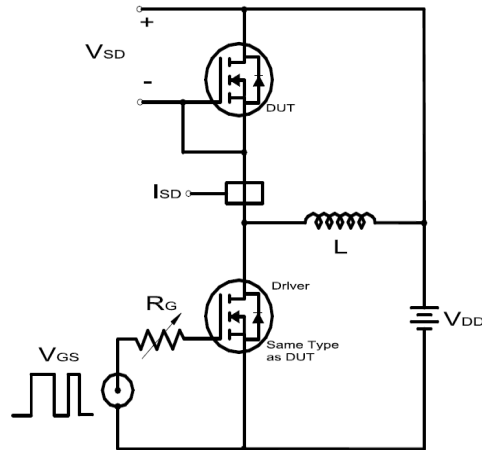


**Figure 6**

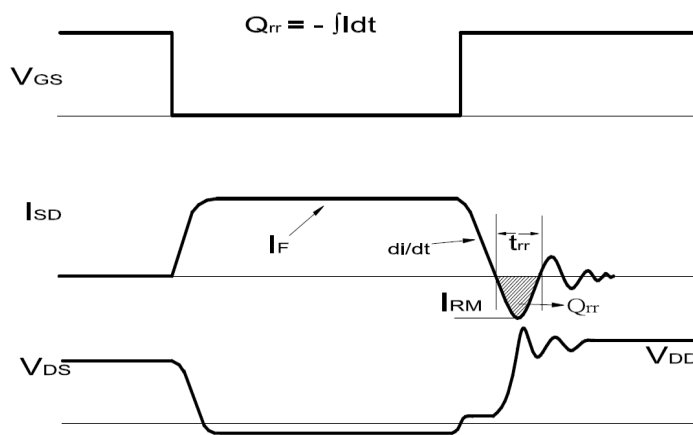
**Unclamped Energy Waveforms**



**Figure 7**  
**Diode Recovery Test Circuit**



**Figure 8**  
**Diode Recovery Test Waveforms**



**TO-252 (DPAK) MECHANICAL DATA**

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	8.9	9.5	10.4	H	0.8	1.27	2.03
B	2.19	2.3	2.435	I	6.35	6.6	6.8
C	0.35	0.5	0.65	J	4.8	5.34	5.5
D	0.89		1.5	K	0.5		1.5
E	0.35		0.65	L	0.4	0.76	0.89
F	0.0		0.23	M	3.96		5.18
G	5.4		6.2	W	3.38	3.58	3.78

