
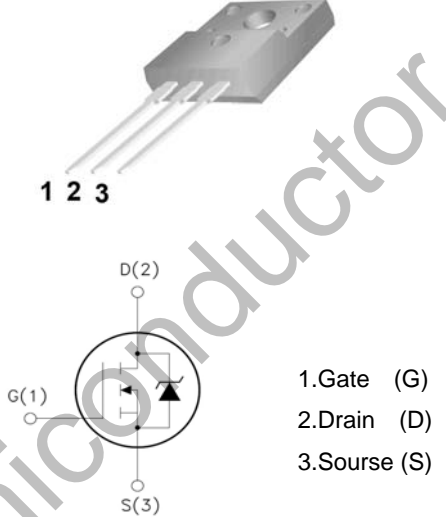


WGF57N10
100V N-Channel MOSFET

Features:

- Low Intrinsic Capacitances.
- Excellent Switching Characteristics.
- Extended Safe Operating Area.
- Unrivalled Gate Charge :Qg= 146.1nC (Typ.).
- BVDS=100V, I_D=57A
- R_{DS(on)} : 17mΩ (Max) @V_G=10V
- 100% Avalanche Tested

TO-220F 



1.Gate (G)
2.Drain (D)
3.Source (S)

Absolute Maximum Ratings* (T_C=25°C Unless otherwise noted)

Symbol	PARAMETER	Value	Unit
V _{DSS}	Drain-Source Voltage	100	V
I _D	Drain Current	T _C =25°C	57
		T _C =100°C	40
V _{GS(TH)}	Gate Threshold Voltage	±20	V
E _{AS}	Single Pulse Avalanche Energy (note1)	580	mJ
I _{AR}	Avalanche Current (note2)	57	A
P _D	Power Dissipation (T _C =25°C)	50	W
T _j	Junction Temperature(MAX)	175	°C
T _{stg}	Storage Temperature	-55~+175	°C
TL	Maximum lead temperature for soldering purpose, 1/8" from case for 5 seconds	300	°C

Thermal Characteristics

Symbol	PARAMETER	Typ.	MAX.	Unit
R _{θJC}	Thermal Resistance, Junction to Case	-	3.0	°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient	-	-	°C/W
R _{θCS}	Thermal Resistance, Case to Sink	-	80	°C/W

Electrical Characteristics (T_C=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 =250μA	100	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2	-	4	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =28A	-	-	17	mΩ
Forward Transconductance	g _{FS}	V _{DS} =25V, I _D =28A	32	-	-	S
Dynamic Characteristics (Note 4)						
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, F=1.0MHz	-	3969	-	PF
Output Capacitance	C _{OSS}		-	182.5	-	PF
Reverse Transfer Capacitance	C _{RSS}		-	160.2	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =30V, I _D =2A, R _L =15Ω V _{GS} =10V, R _G =2.5Ω	-	17	-	nS
Turn-on Rise Time	t _r		-	13	-	nS
Turn-Off Delay Time	t _{d(off)}		-	55	-	nS
Turn-Off Fall Time	t _f		-	16	-	nS
Total Gate Charge	Q _g	V _{DS} =30V, I _D =30A, V _{GS} =10V	-	146.1	-	nC
Gate-Source Charge	Q _{gs}		-	29.3	-	nC
Gate-Drain Charge	Q _{gd}		-	57.1	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V, I _S =28A	-	0.85	1.2	V
Diode Forward Current (Note 2)	I _S		-	-	57	A
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F = 28A di/dt = 100A/μs (Note 3)	-	35	-	nS
Reverse Recovery Charge	Q _{rr}		-	58	-	nC
Forward Turn-On Time	t _{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

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 production
5. EAS condition: T_j=25°C, V_{DD}=50V, V_G=10V, R_G=25Ω, L=1mH, I_{AS}=35A

Typical Electrical and Thermal Characteristics (Curves)

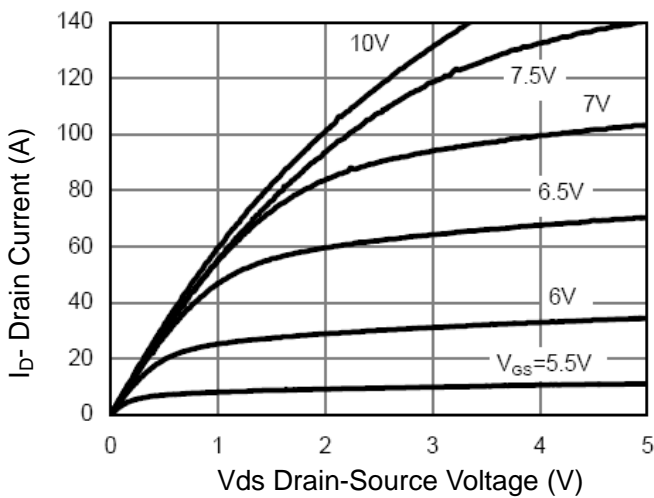


Figure 1 Output Characteristics

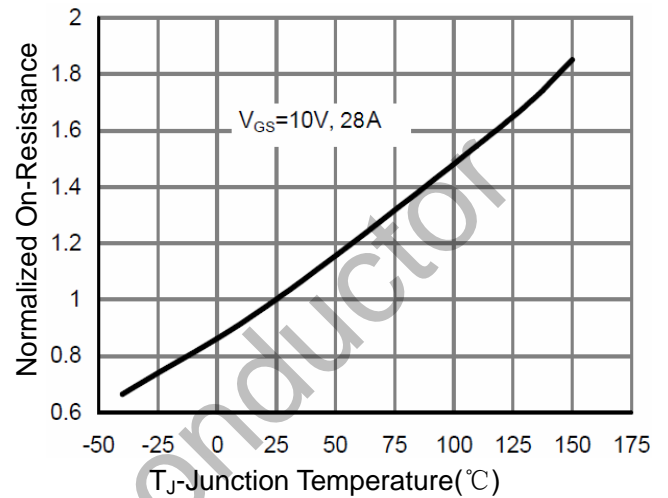


Figure 4 R_{dson} -Junction Temperature

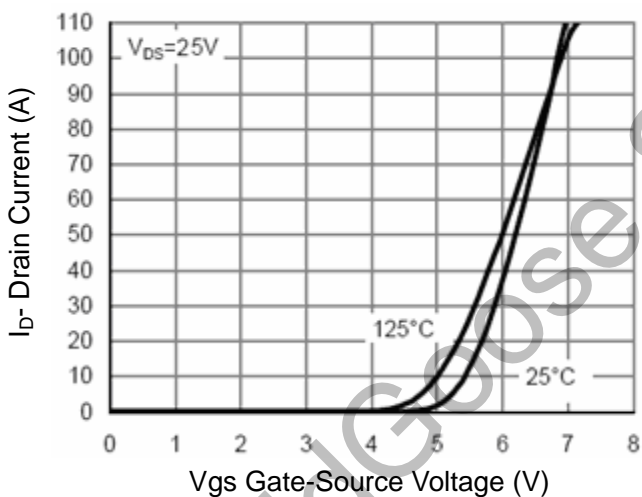


Figure 2 Transfer Characteristics

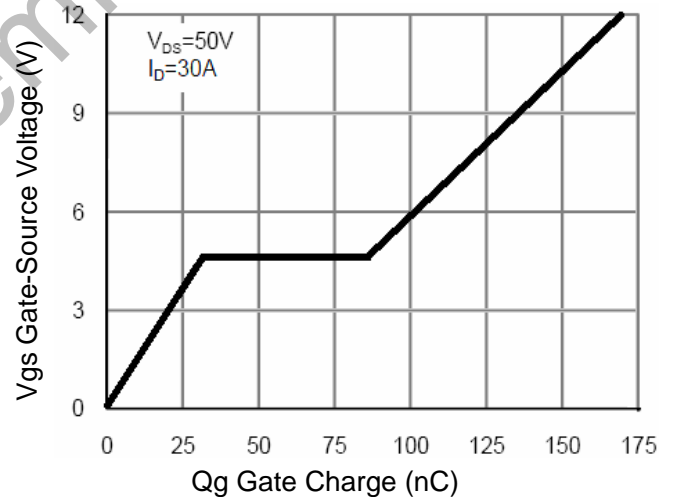


Figure 5 Gate Charge

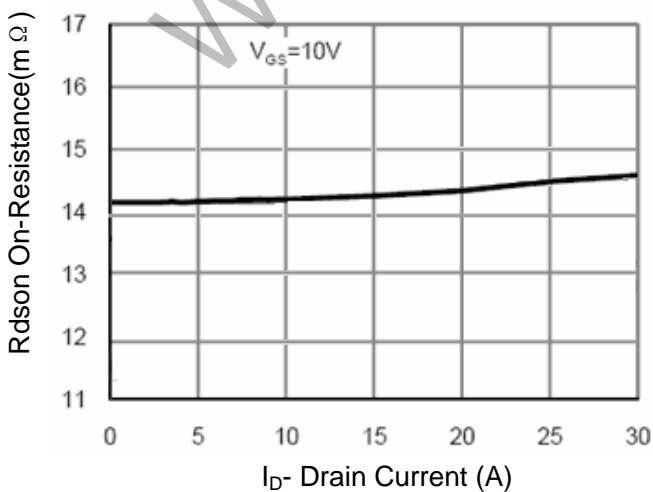


Figure 3 R_{dson} - Drain Current

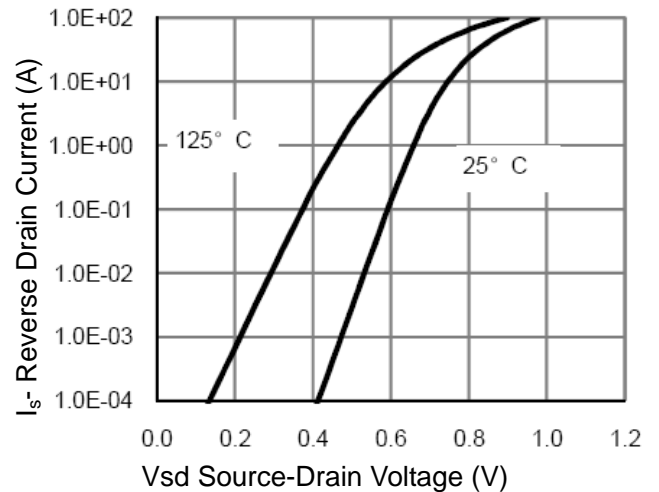


Figure 6 Source- Drain Diode Forward

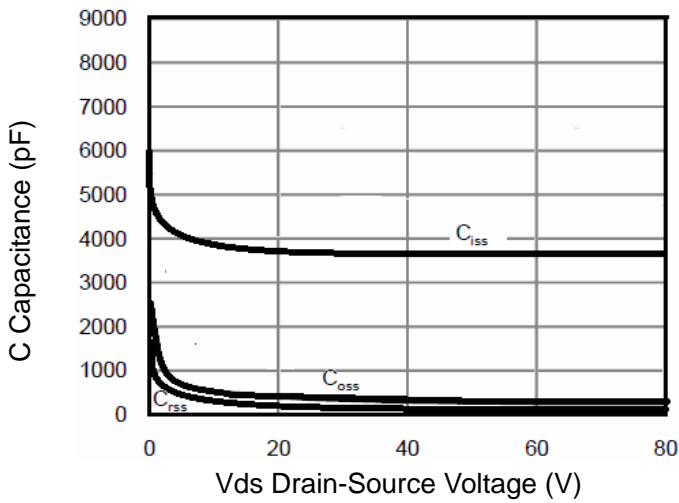


Figure 7 Capacitance vs Vds

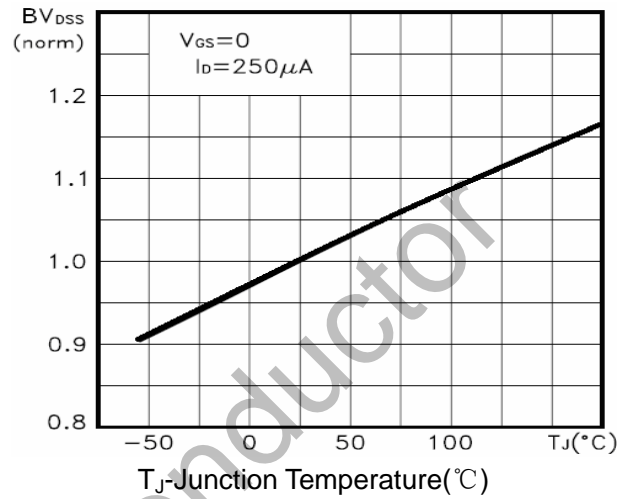


Figure 9 BV_{DSS} vs Junction Temperature

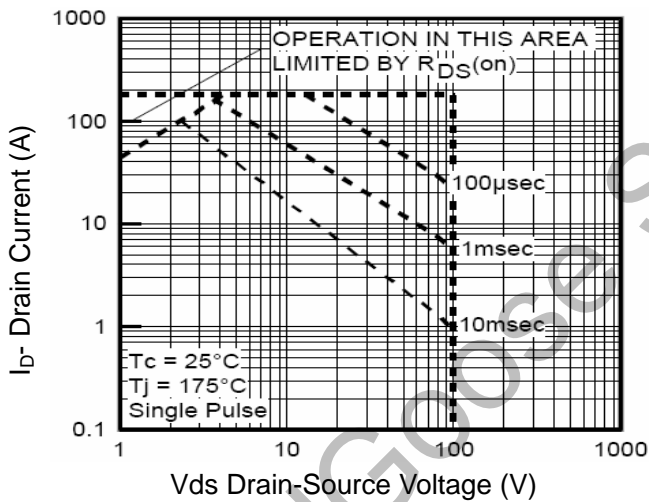


Figure 8 Safe Operation Area

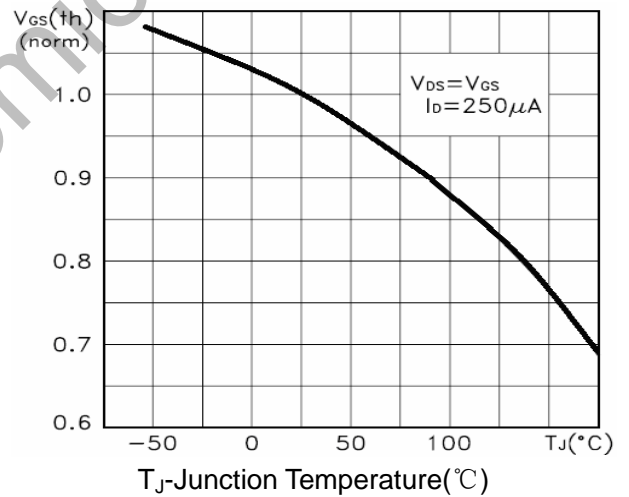


Figure 10 $V_{GS(th)}$ vs Junction Temperature

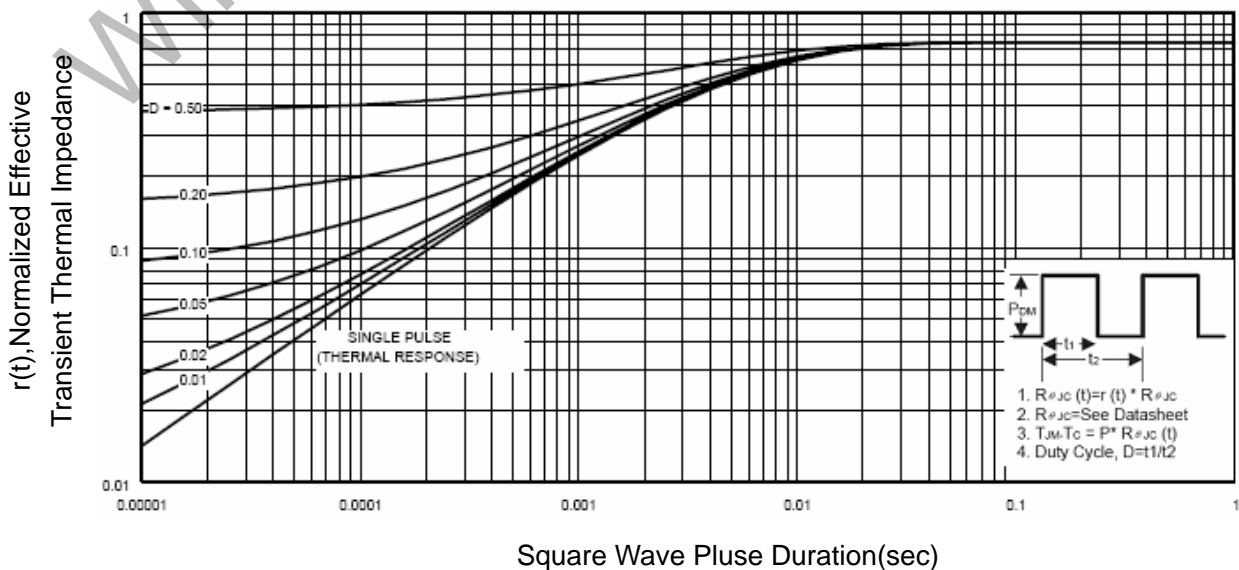
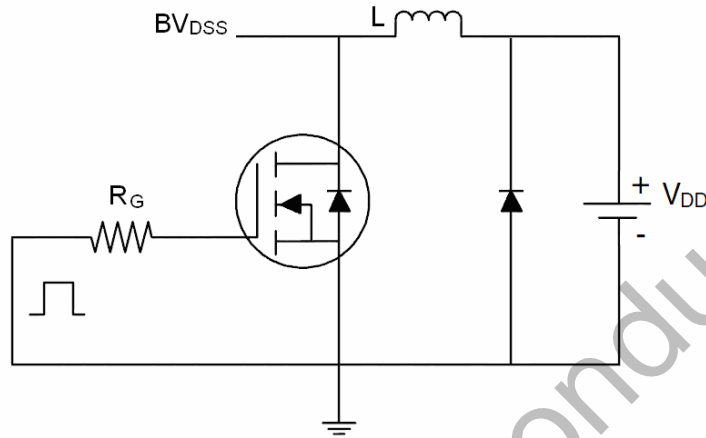


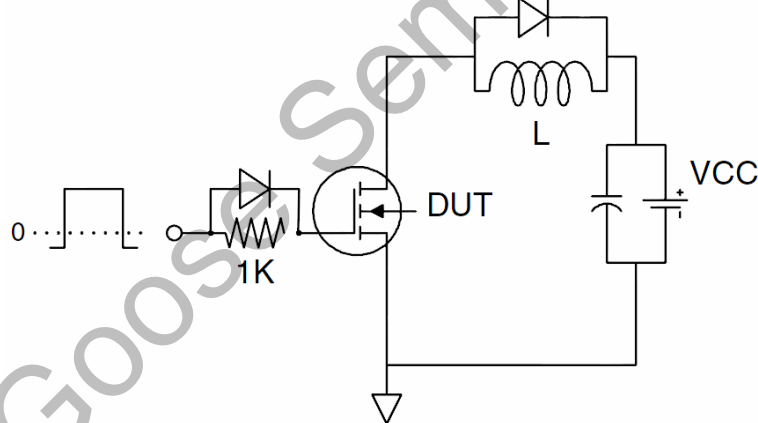
Figure 11 Normalized Maximum Transient Thermal Impedance

Test Circuit

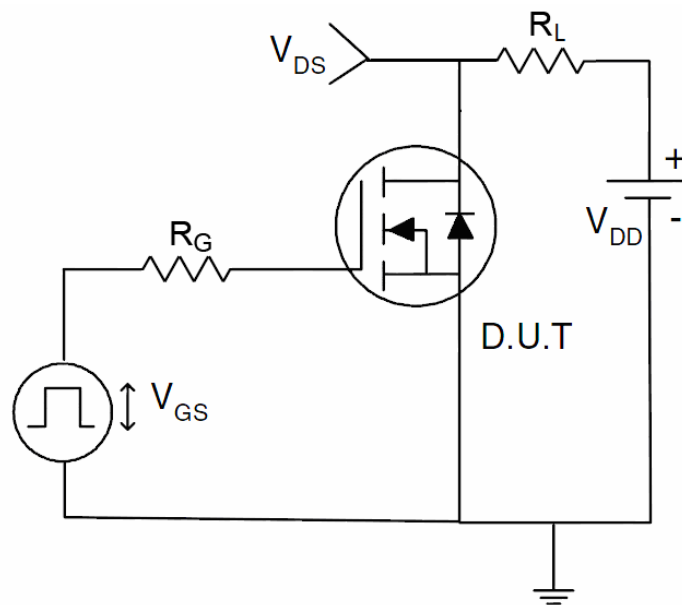
1) E_{AS} test Circuit



2) Gate charge test Circuit



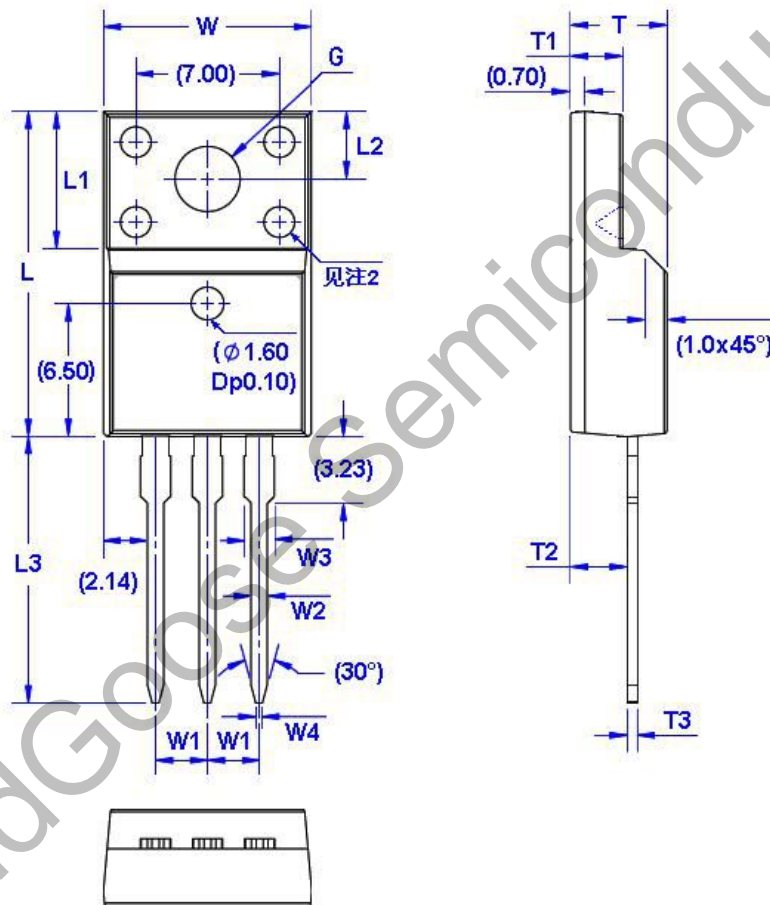
3) Switch Time Test Circuit



Package Dimension

TO-220F

Unit: mm



Symbol	Size		Symbol	Size		Symbol	Size		Symbol	Size	
	Min	Max		Min	Max		Min	Max		Min	Max
W	9.96	10.36	W4	0.25	0.45	L3	12.78	13.18	T3	0.45	0.60
W1	2.54 (TYP)		L	15.67	16.07	T	4.50	4.90	G(Φ)	3.08	3.28
W2	0.70	0.90	L1	6.48	6.88	T1	2.34	2.74			
W3	1.24	1.47	L2	3.20	3.40	T2	2.56	2.96			