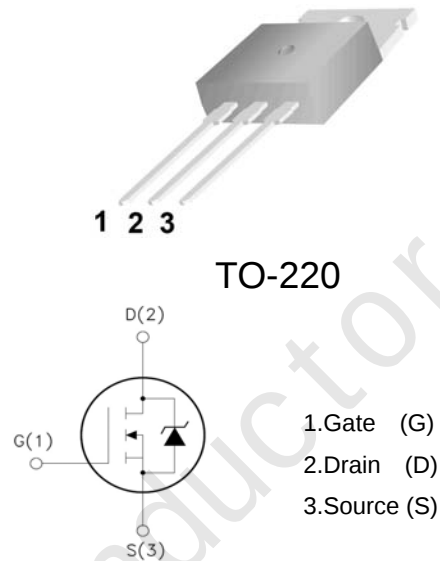


Features:

- ☐ Low Intrinsic Capacitances.
- ☐ Excellent Switching Characteristics.
- ☐ Extended Safe Operating Area.
- ☐ Unrivalled Gate Charge :Qg= 31nC (Typ.).
- ☐ BVDSS=60V, I_D=50A
- ☐ R_{DS(on)} : 22mΩ (Max) @V_G=10V
- ☐ 100% Avalanche Tested



Absolute Maximum Ratings* (T_c=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V _{DSS}	Drain-Source Voltage	60	V
I _D	Drain Current	T _C =25°C	A
		T _C =100°C	
V _{GSS}	Gate Threshold Voltage	±25	V
E _{AS}	Single Pulse Avalanche Energy (note1)	490	mJ
I _{AR}	Avalanche Current (note2)	50	A
P _D	Power Dissipation (T _c =25°C)	120	W
T _j	Junction Temperature(MAX)	150	°C
T _{stg}	Storage Temperature	-55~+150	
TL	Maximum lead temperature for soldering purpose, 1/8" from case for 5 seconds	300	

Thermal Characteristics

Symbol	Parameter	Typ.	MAX.	Unit
R _{θJC}	Thermal Resistance, Junction to Case	-	1.24	°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient	-	62.5	
R _{θCS}	Thermal Resistance, Case to Sink	-	0.5	

Electrical Characteristics Tc=25°C unless other wise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	ID=250 μ A, VGS=0	60	--	--	V
ΔBV _{DSS} / ΔT _J	Breakdown Voltage Temperature Confficient	ID=250 μ A, Reference to 25°C	--	0.06	--	V/°C
IDSS	Zero Gate Voltage Drain Current	Vds=60V, Vgs=0V	--	--	1	μ A
		Vds=48V, Tc=125 °C			10	μ A
IGSSF	Gate-body leakage Current, Forward	Vgs=+25V, Vds=0V	--	--	100	nA
IGSSR	Gate-body leakage Current, Reverse	Vgs=-25V, Vds=0V	--	--	-100	nA

On Characteristics

V _{GS(th)}	Gate Threshold Voltage	Id=250uA, Vds=Vgs	2	--	4	V
R _{DS(on)}	Static Drain-Source On-Resistance	Id=25A, Vgs=10V	--	--	0.022	Ω

Dynamic Characteristics

Ciss	Input Capacitance	VDS=25V, VGS=0, f=1.0MHz	--	1180	1540	pF
Coss	Output Capacitance		--	440	580	pF
Crss	Reverse Transfer Capacitance		--	65	90	pF

Switching Characteristics

Td(on)	Turn-On Delay Time	VDD=250V, ID=25A RG=25 Ω (Note 3,4)	--	15	40	nS
Tr	Turn-On Rise Time		--	105	220	nS
Td(off)	Turn-Off Delay Time		--	60	130	nS
Tf	Turn-Off Fall Time		--	65	140	nS
Qg	Total Gate Charge	VDS=400, VGS=10V, ID=25A (Note 3,4)	--	31	41	nC
Qgs	Gate-Source Charge		--	8	--	nC
Qgd	Gate-Drain Charge			13	--	nC

Drain-Source Diode Characteristics and Maximum Ratings

IS	Maximun Continuous Drain-Source Diode Forward Current		--	--	50	A
ISM	Maximun Plused Drain-Source Diode Forward Current		--	--	200	A
VSD	Drain-Source Diode Forward Voltage	Id=25A	--	--	1.5	V
trr	Reverse Recovery Time	IS=25A, VGS =0V	--	52	--	nS
Qrr	Reverse Recovery Charge	di/dt=100A/ μ s (Note3)	--	75	--	μ C

- *Notes
- 1, L=9.3mH, IAS=50A, VDD=50V, RG=25Ω, Starting TJ =25°C
 - 2, Repetitive Rating : Pulse width limited by maximum junction temperature
 - 3, Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%
 - 4, Essentially Independent of Operating Temperature

Typical Characteristics

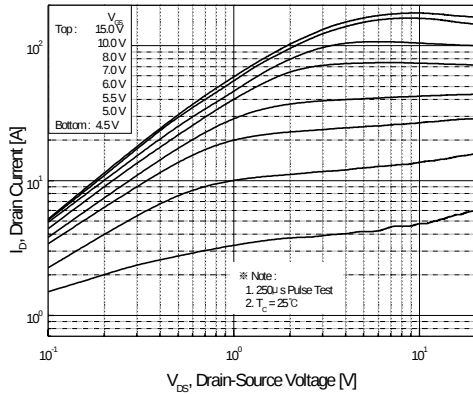


Figure 1. On-Region Characteristics

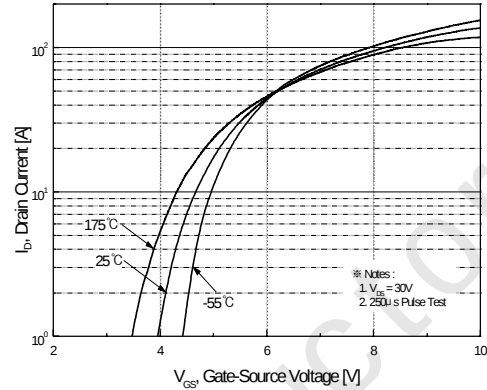


Figure 2. Transfer Characteristics

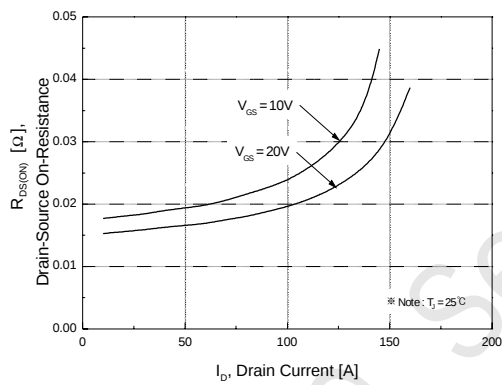


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

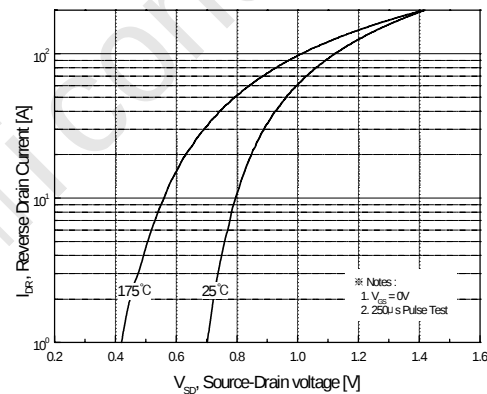


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

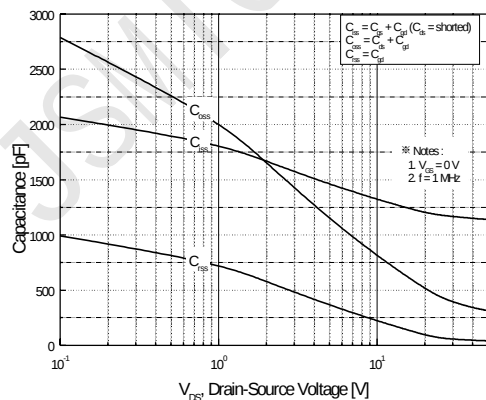


Figure 5. Capacitance Characteristics

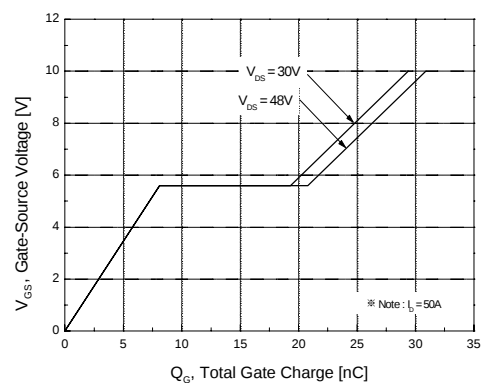


Figure 6. Gate Charge Characteristics

Typical Characteristics (Continued)

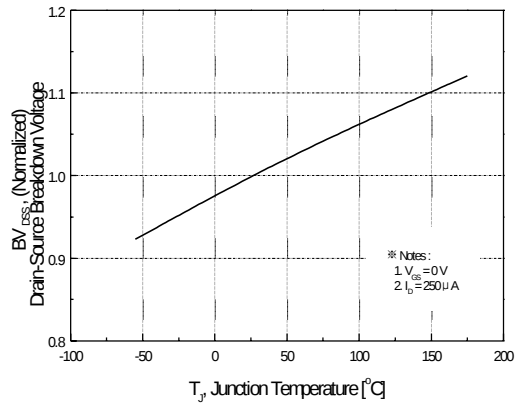


Figure 7. Breakdown Voltage Variation vs. Temperature

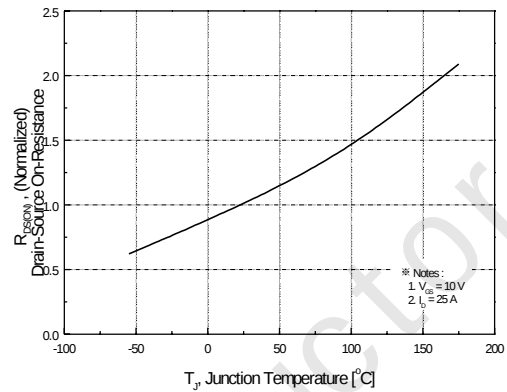


Figure 8. On-Resistance Variation vs. Temperature

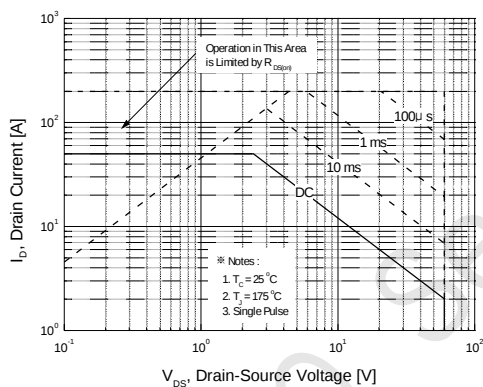


Figure 9. Maximum Safe Operating Area

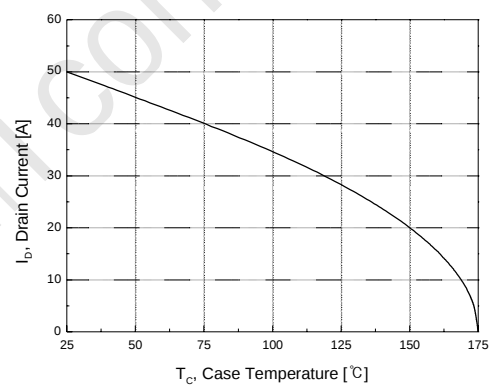


Figure 10. Maximum Drain Current vs. Case Temperature

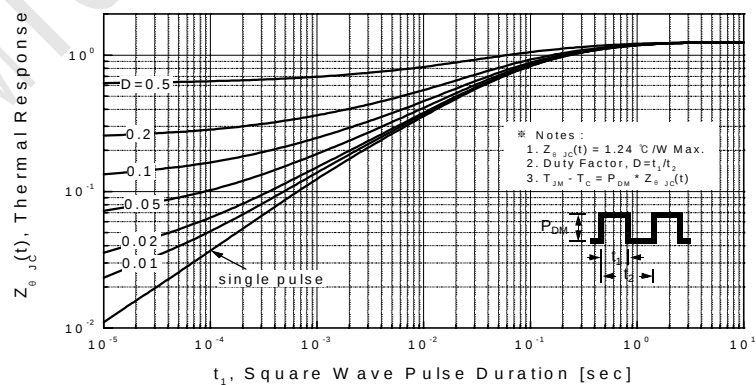
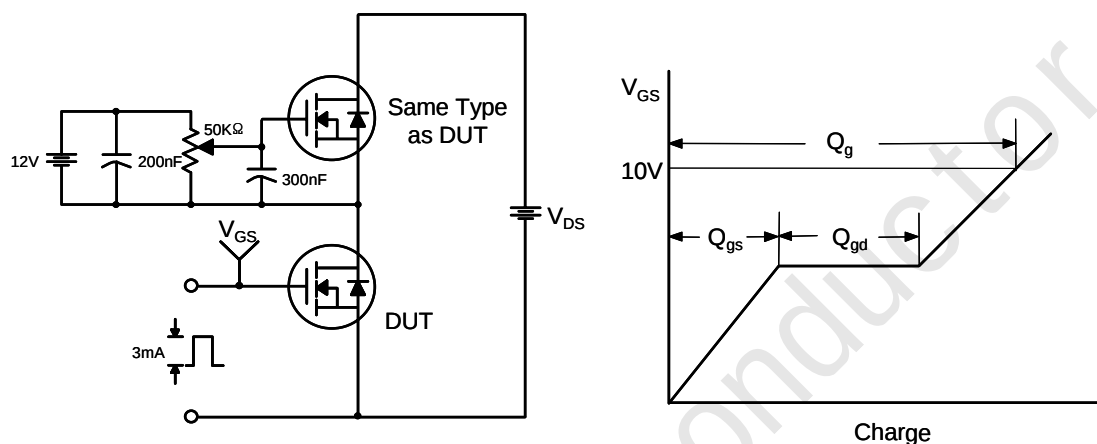


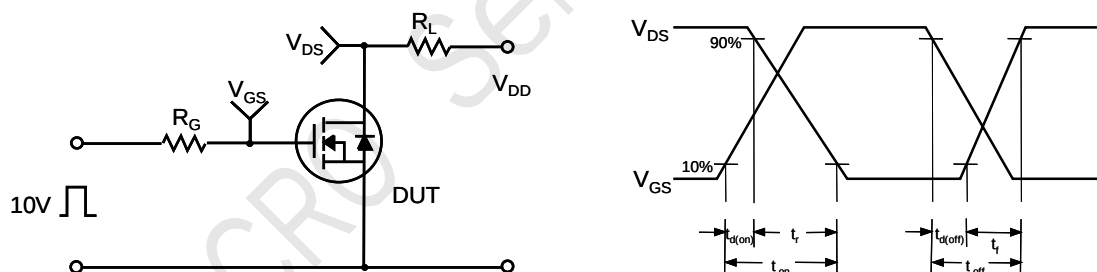
Figure 11. Transient Thermal Response Curve

Typical Characteristics (Continued)

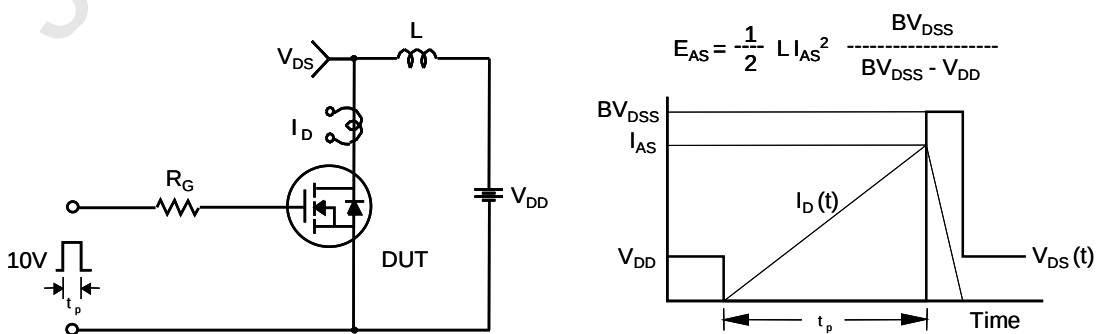
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

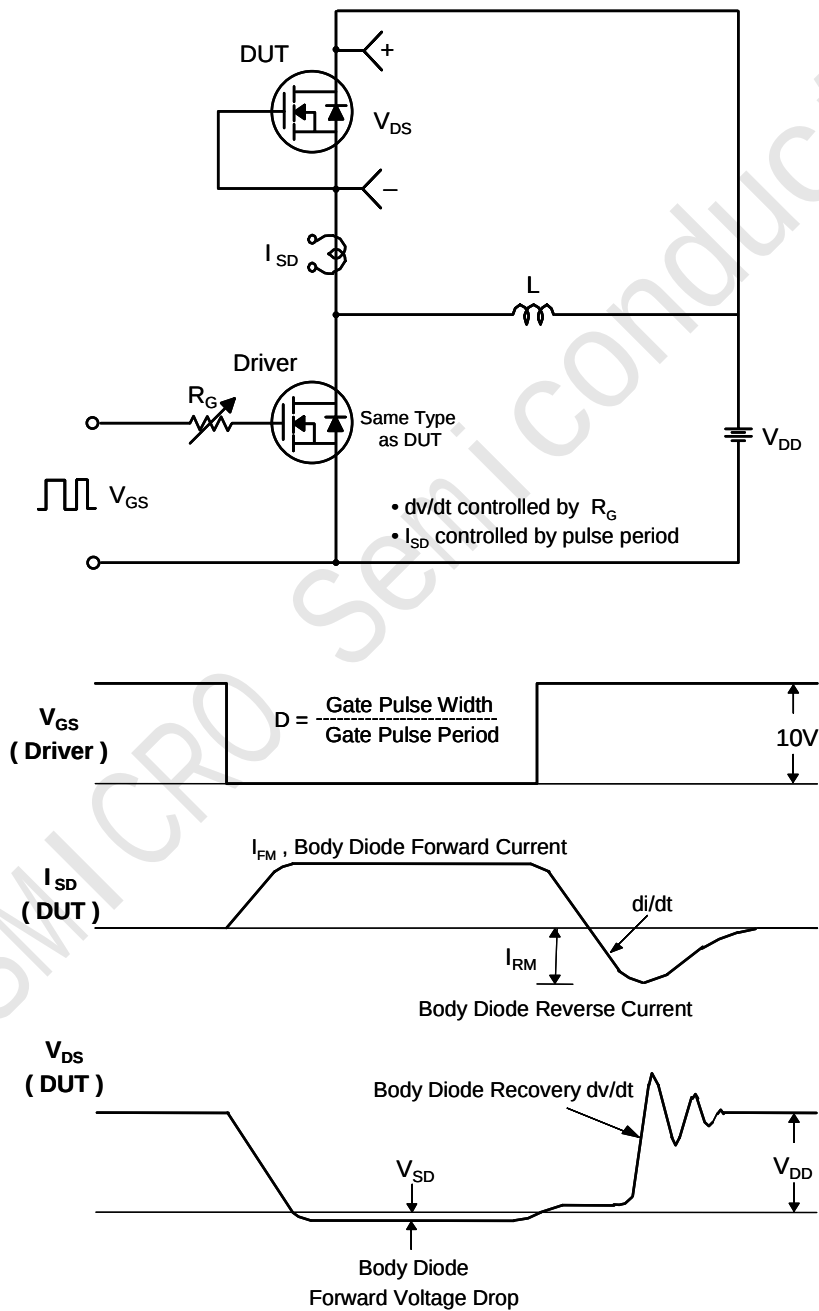


Unclamped Inductive Switching Test Circuit & Waveforms



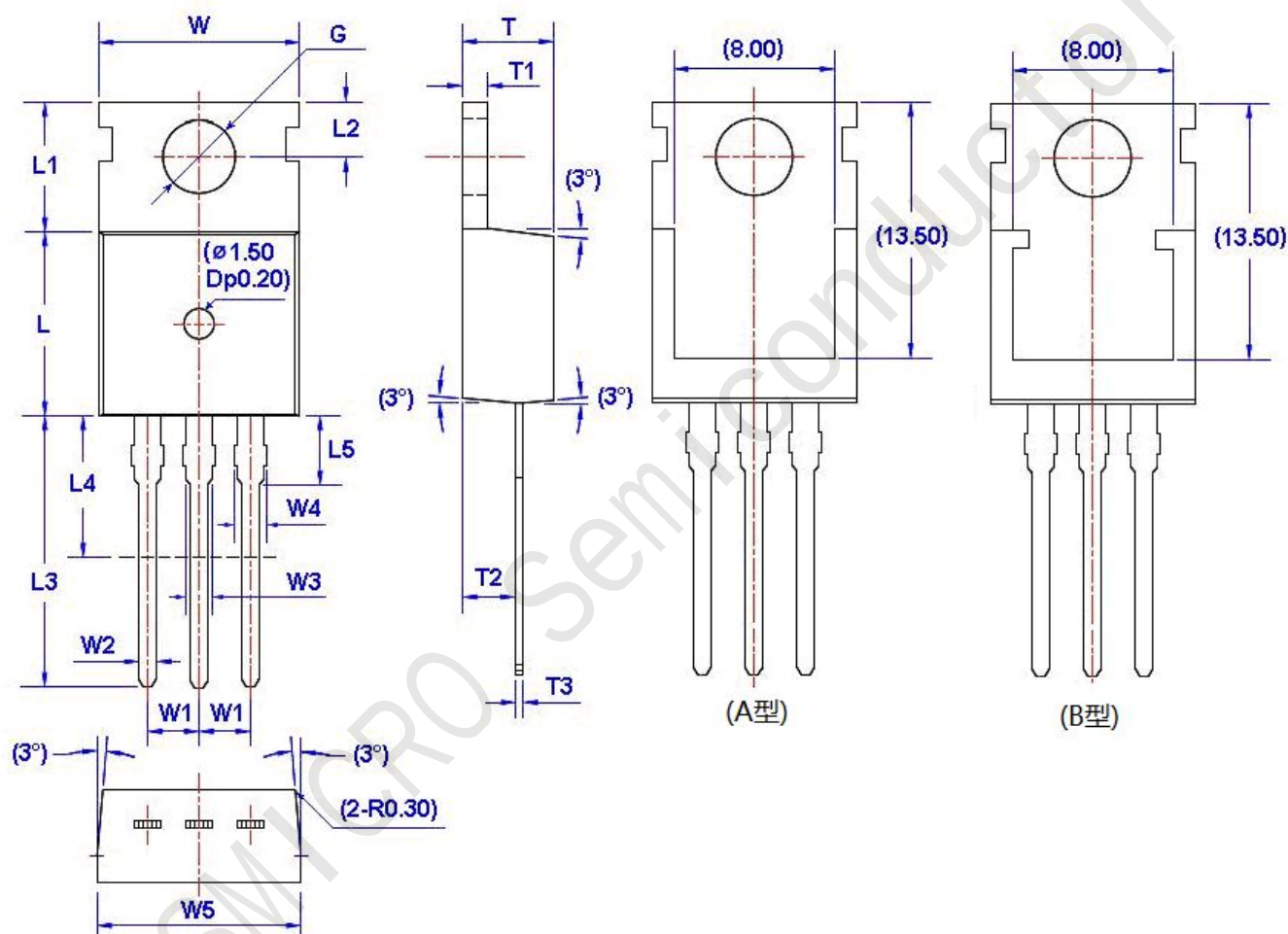
Typical Characteristics (Continued)

Peak Diode Recovery dv/dt Test Circuit & Waveforms



TO-220AB

Unit: mm



Symbol	Size		Symbol	Size		Symbol	Size		Symbol	Size	
	Min	Max		Min	Max		Min	Max		Min	Max
W	9.66	10.28	W5	9.80	10.20	L4**	6.20	6.60	T3	0.45	0.60
W1	2.54 (TYP)		L	9.00	9.40	L5	2.79	3.30	G(Φ)	3.50	3.70
W2	0.70	0.95	L1	6.40	6.80	T	4.30	4.70			
W3	1.17	1.37	L2	2.70	2.90	T1	1.15	1.40			
W4*	1.32	1.72	L3	12.70	14.27	T2	2.20	2.60			