N-Channel Enhancement Mode Power MOSFET

Description

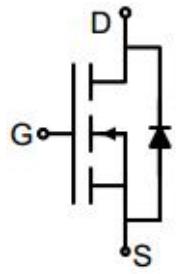
This advanced MOSFET family has optimized on-state resistance, and also provides superior switching performance and higher avalanche energy strength. This device family is suitable for high efficiency switch mode power supplies.

General Features

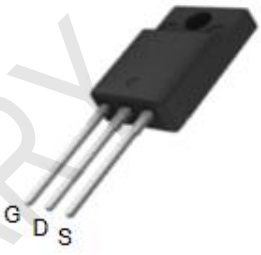
- V_{DS} 800V
- I_D (at V_{GS} = 10V) 10A
- $R_{DS(ON)}$ (at V_{GS} = 10V) < 0.9Ω
- 100% Avalanche Tested
- RoHS Compliant

Application

- LED power supplies
- Cell Phone Charger
- Standby Power



Schematic diagram



TO-220F

PRELIMINARY

Ordering Information

Device	Package	Marking	Packaging
G10N80F	TO-220F	G10N80	50pcs/Tube

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	800	V
Continuous Drain Current	I_D	10	A
Pulsed Drain Current (note1)	I_{DM}	40	A
Gate-Source Voltage	V_{GS}	±30	V
Power Dissipation	P_D	50	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 To 150	ºC

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62	ºC/W
Maximum Junction-to-Case	R_{thJC}	2.5	ºC/W

Specifications T_J = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	800	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 800V, V_{GS} = 0V	--	--	1	μA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±30V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	3.0	3.7	5.0	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 2A	--	0.75	0.9	Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1.0MHz	--	2185	--	pF
Output Capacitance	C_{oss}		--	168	--	
Reverse Transfer Capacitance	C_{rss}		--	12	--	
Total Gate Charge	Q_g	V_{DD} = 400V, I_D = 2A, V_{GS} = 10V	--	45	--	nC
Gate-Source Charge	Q_{gs}		--	14	--	
Gate-Drain Charge	Q_{gd}		--	18	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 400V, I_D = 2A, R_G = 25Ω	--	50	--	ns
Turn-on Rise Time	t_r		--	130	--	
Turn-off Delay Time	$t_{d(off)}$		--	100	--	
Turn-off Fall Time	t_f		--	80	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	10	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 2A, V_{GS} = 0V	--	--	1.2	V
Reverse Recovery Charge	Qrr	I_F = 2A, V_{GS} = 0V di/dt=100A/us	--	11	--	uC
Reverse Recovery Time	T_{rr}		--	730	--	ns

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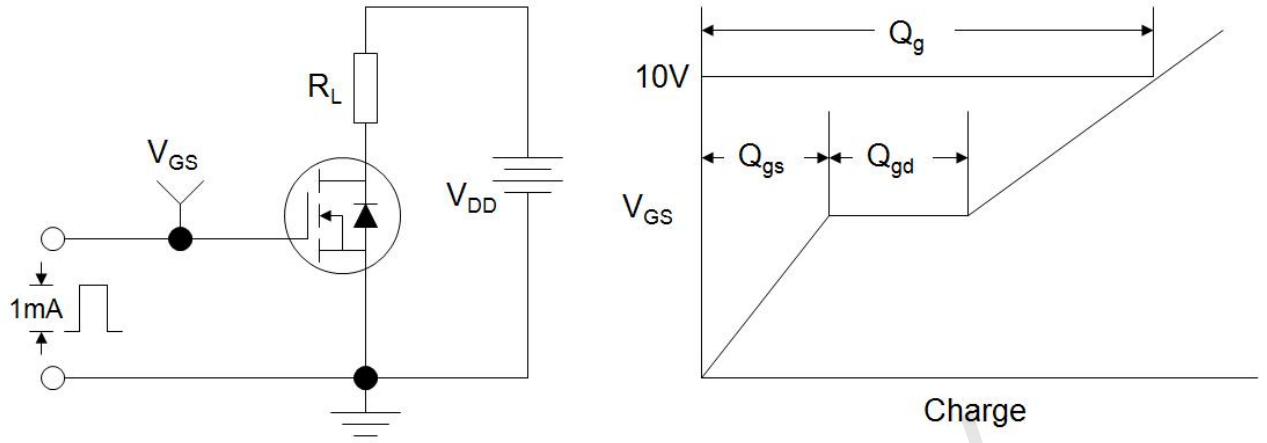
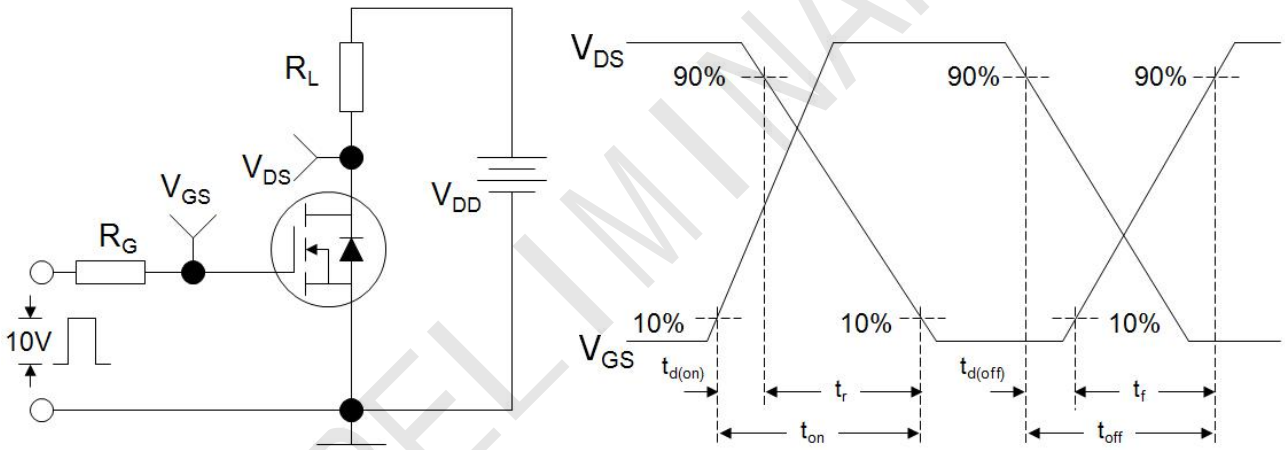
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical R_G

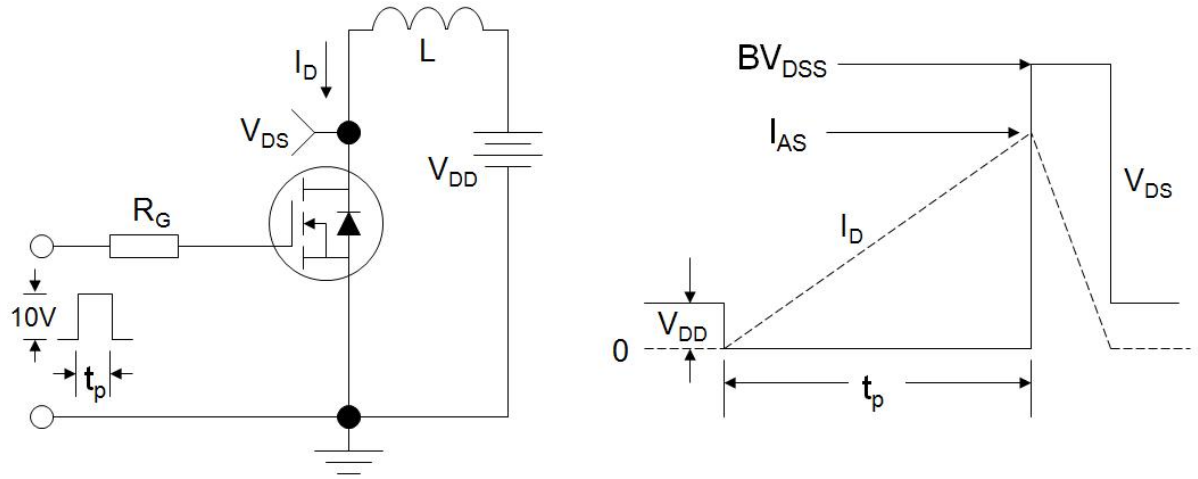
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



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Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

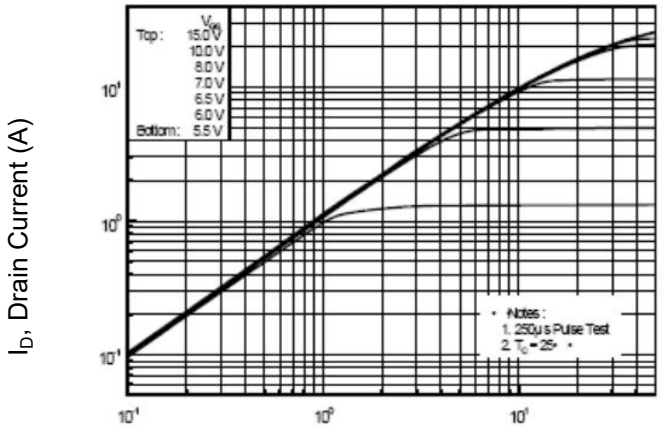


Figure 2. Transfer Characteristics

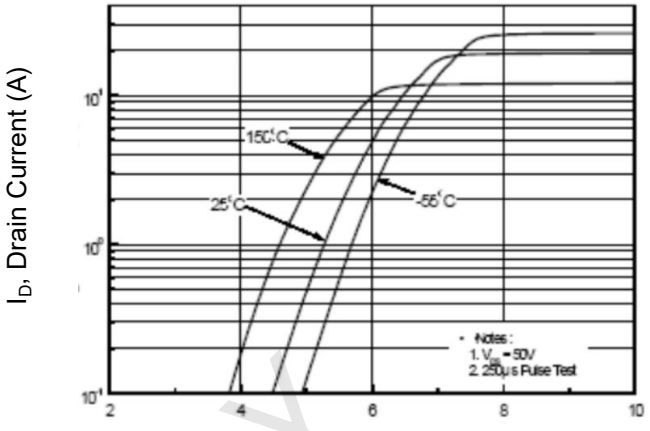


Figure 3. Drain Source On Resistance

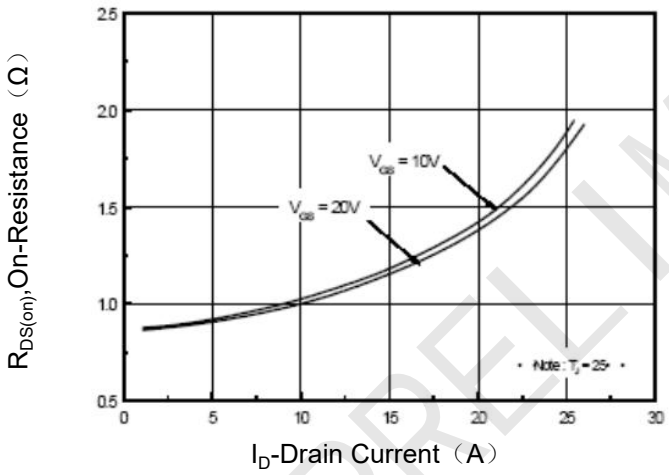


Figure 4. Gate Charge

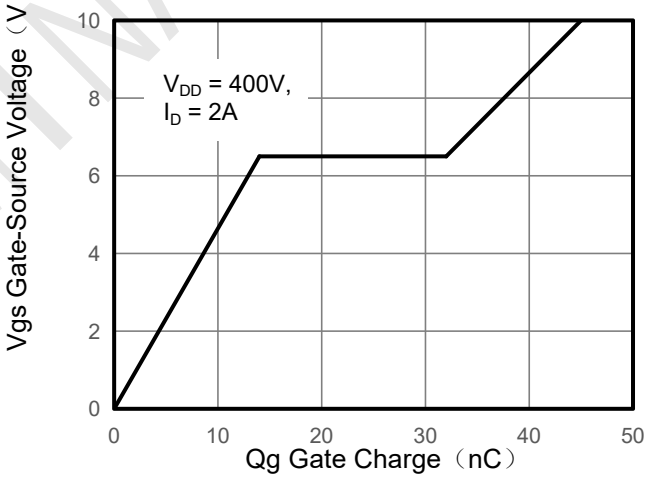


Figure 5. Capacitance

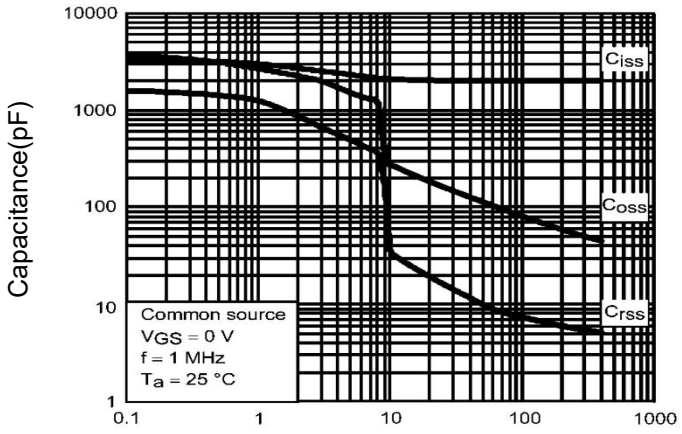
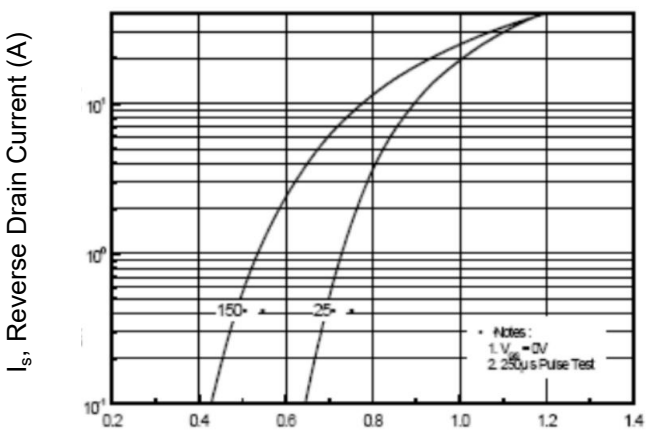


Figure 6. Source-Drain Diode Forward



PRELIMINARY

Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

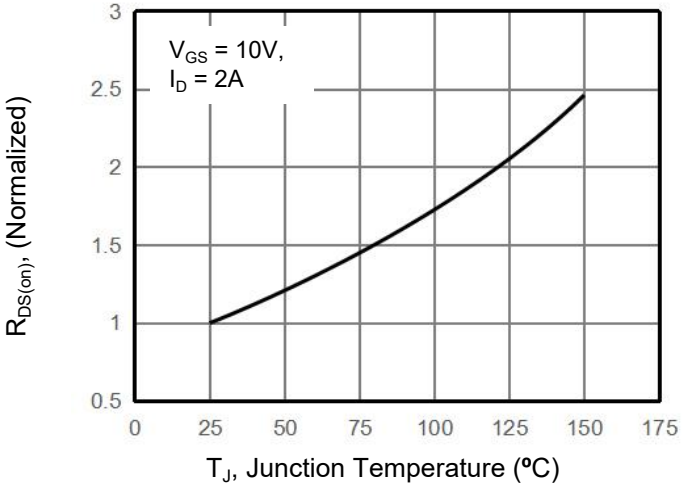


Figure 8. Safe Operation Area

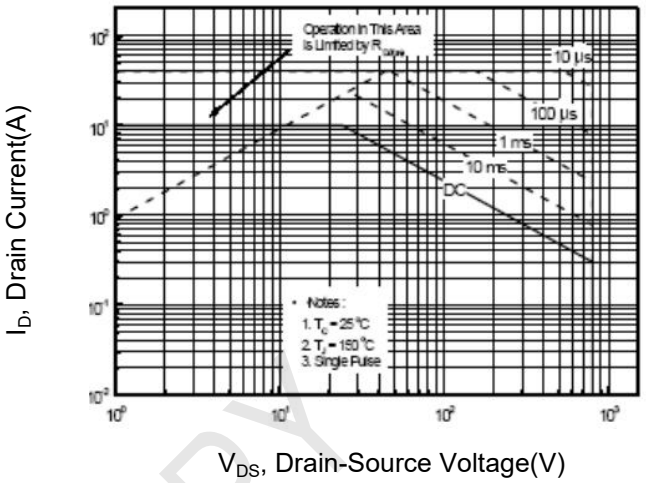
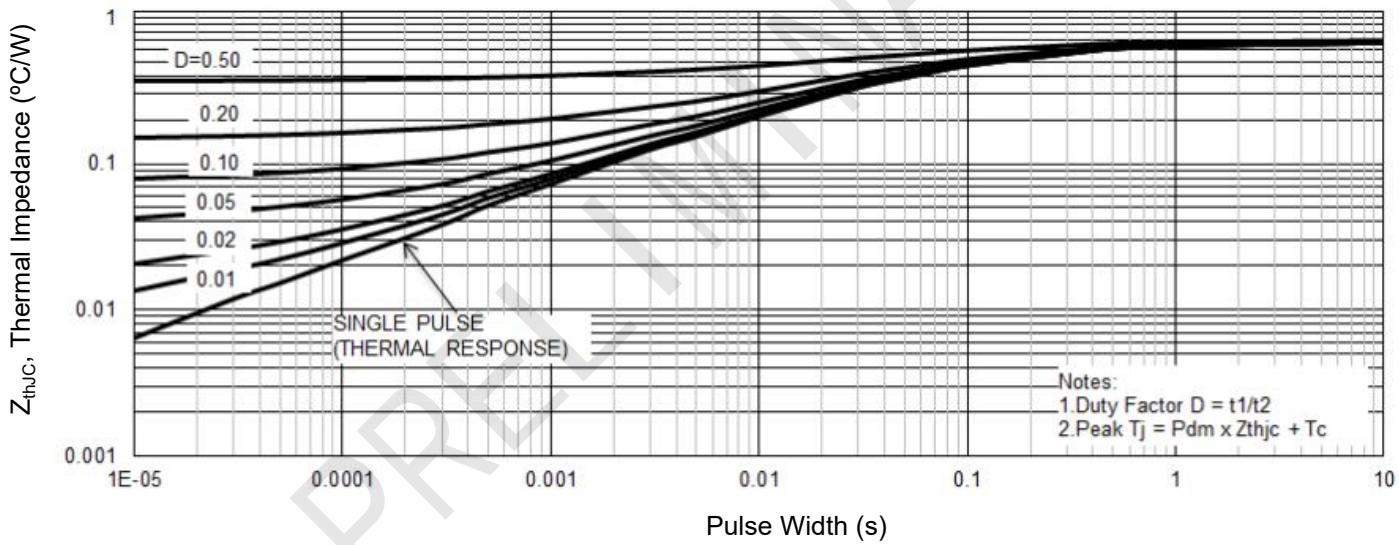


Figure 9. Normalized Maximum Transient Thermal Impedance



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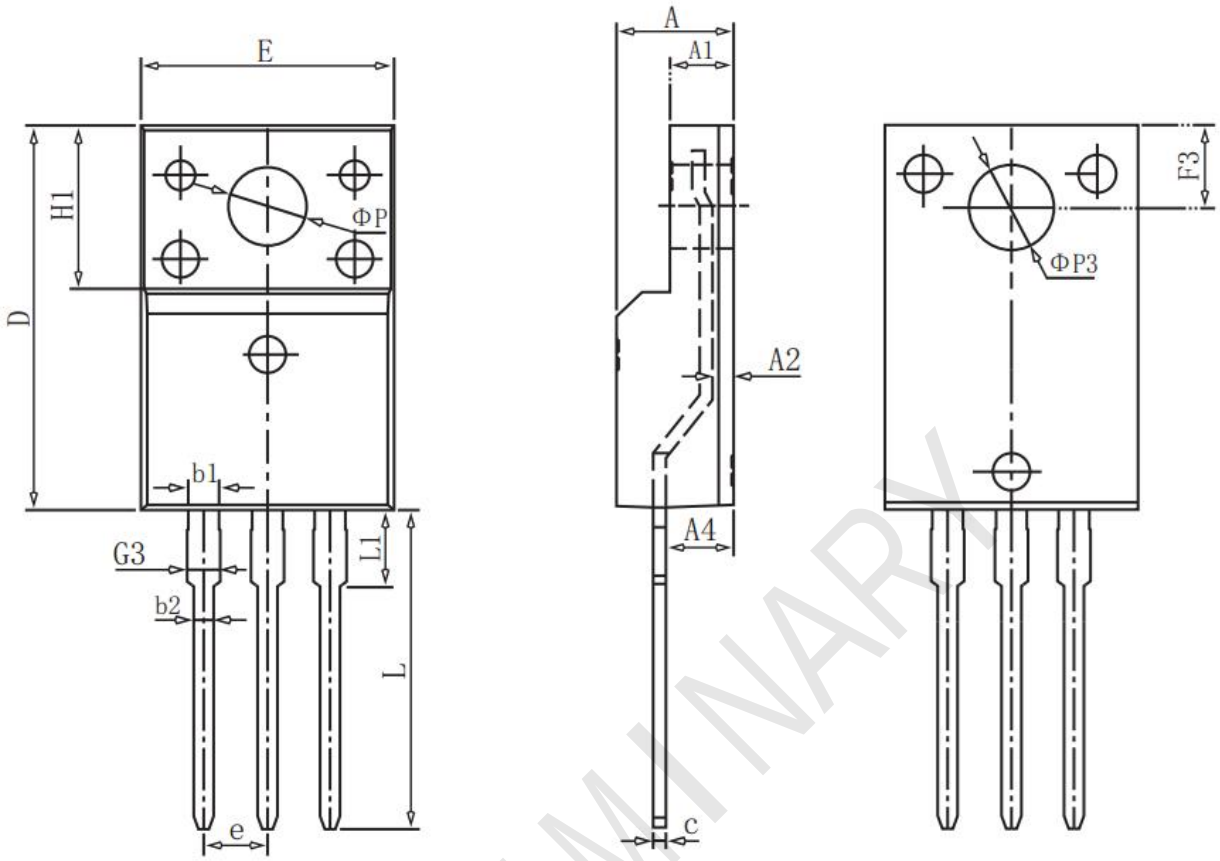
TO-220F Package Information



PRELIMINARY

COMMON DIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
E	10.00	10.20	10.40
A	4.50	4.70	4.90
A1	2.34	2.54	2.74
A2	0.65	0.85	1.30
A4	2.55	2.75	2.95
c	0.40	0.50	0.65
D	15.57	15.87	16.17
H1		6.70REF	
e		2.54BSC	
ΦP		3.183REF	
L	12.68	12.98	13.28
L1	3.25	3.45	3.65
ΦP3		3.45REF	
F3	3.10	3.30	3.50
G3	1.10	1.30	1.50
b1	1.05	1.20	1.35
b2	0.70	0.80	0.92