

General Description

These N-Channel enhancement mode power field effect transistors are produced using, planar stripe, DMOS technology.

This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for electronic lamp starter and ballast.

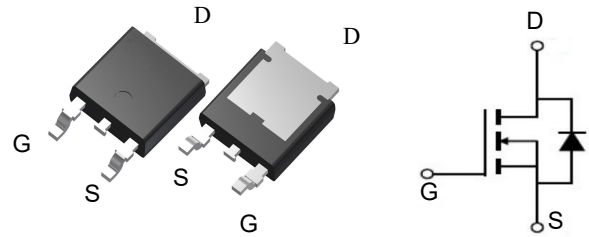


Features

V_{DSS}	1000	V
I_D	3	A
$P_D(T_C=25^{\circ}\text{C})$	50	W
$R_{DS(ON)}(at V_{GS}=4.5V)$	7.1	Ω

Application

- Fast switching
- Improved dv/dt capability



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
MY3N100TD	TO-252-2L	MY3N100TD	2500

Absolute Maximum Ratings

 $T_C = 25^{\circ}\text{C}$ unless otherwise noted

Symbol	Parameter	MY2N100T	Units
V_{DSS}	Drain-Source Voltage	1000	V
I_D	Drain Current - Continuous ($T_C = 25^{\circ}\text{C}$)	3	A
	- Continuous ($T_C = 100^{\circ}\text{C}$)	1.5	A
I_{DM}	Drain Current - Pulsed (Note 1)	6.4	A
V_{GSS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	160	mJ
I_{AR}	Avalanche Current (Note 1)	1.6	A
E_{AR}	Repetitive Avalanche Energy (Note 1)	5.0	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	5.5	V/ns
P_D	Power Dissipation ($T_A = 25^{\circ}\text{C}$) *	2.5	W
	Power Dissipation ($T_C = 25^{\circ}\text{C}$)	50	W
	- Derate above 25°C	0.4	W/ $^{\circ}\text{C}$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^{\circ}\text{C}$
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	$^{\circ}\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	--	2.5	$^{\circ}\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient *	--	50	$^{\circ}\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	--	110	$^{\circ}\text{C/W}$

* When mounted on the minimum pad size recommended (PCB Mount)

MY3N100TD

1000V N-Channel Enhancement Mode MOSFET



Electrical Characteristics T_C = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 μA	1000	--	--	V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	I _D = 250 μA, Referenced to 25°C	--	0.976	--	V/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 1000 V, V _{GS} = 0 V	--	--	10	μA
		V _{DS} = 800 V, T _C = 125°C	--	--	100	μA
I _{GSSF}	Gate-Body Leakage Current, Forward	V _{GS} = 30 V, V _{DS} = 0 V	--	--	100	nA
I _{GSSR}	Gate-Body Leakage Current, Reverse	V _{GS} = -30 V, V _{DS} = 0 V	--	--	-100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250 μA	3.0	--	5.0	V
R _{DS(on)}	Static Drain-Source On-	V _{GS} = 10 V, I _D = 0.8 A	--	7.1	9	Ω
g _{FS}	Forward Transconductance	V _{DS} = 50 V, I _D = 0.8 A (Note 4)	--	1.9	--	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = 25 V, V _{GS} = 0 V, f = 1.0 MHz	--	400	520	pF
C _{oss}	Output Capacitance		--	40	52	pF
C _{rss}	Reverse Transfer Capacitance		--	5	6.5	pF
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} = 500 V, I _D = 2.0 A, R _G = 25 Ω (Note 4, 5)	--	13	35	ns
t _r	Turn-On Rise Time		--	30	70	ns
t _{d(off)}	Turn-Off Delay Time		--	25	60	ns
t _f	Turn-Off Fall Time		--	35	80	ns
Q _g	Total Gate Charge	V _{DS} = 800 V, I _D = 2.0 A, V _{GS} = 10 V (Note 4, 5)	--	12	15.5	nC
Q _{gs}	Gate-Source Charge		--	2.5	--	nC
Q _{gd}	Gate-Drain Charge		--	6.5	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain-Source Diode Forward Current		--	--	1.5	A
Notes: I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	6.0	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} = 0 V, I _S = 1.6 A	--	--	1.4	V
t _{rr}	Reverse Recovery Time	V _{GS} = 0 V, I _S = 2.0 A, dI _F / dt = 100 A/μs (Note 4)	--	520	--	ns
Q _{rr}	Reverse Recovery Charge		--	2.3	--	μC

Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. L = 120mH, I_{AS} = 1.6A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C
3. I_{SD} ≤ 2.0A, di/dt ≤ 300A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C
4. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%
5. Essentially independent of operating temperature

Typical Characteristics

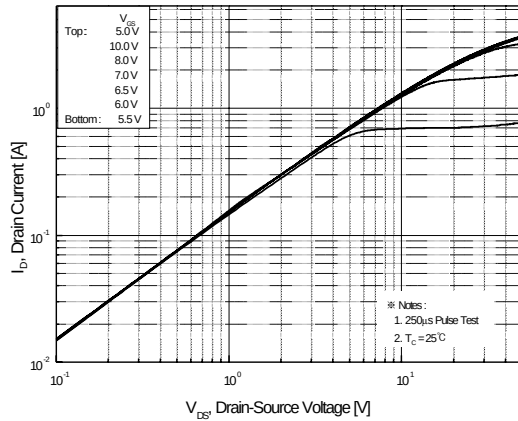


Figure 1. On-Region Characteristics

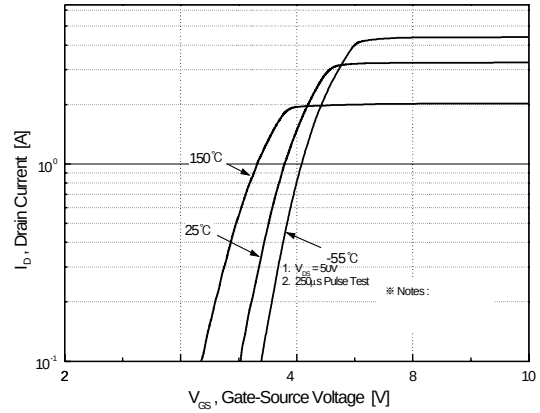


Figure 2. Transfer Characteristics

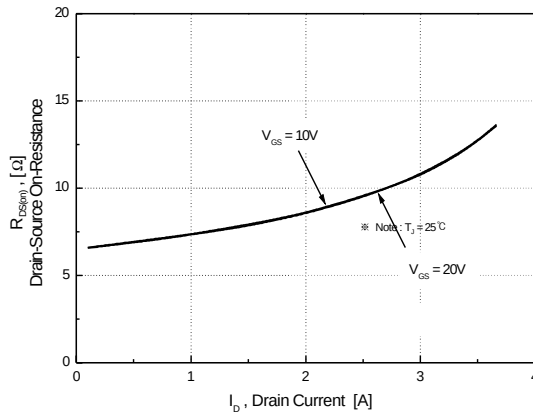


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

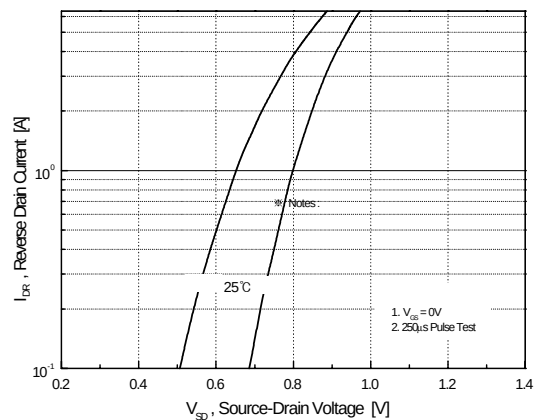


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

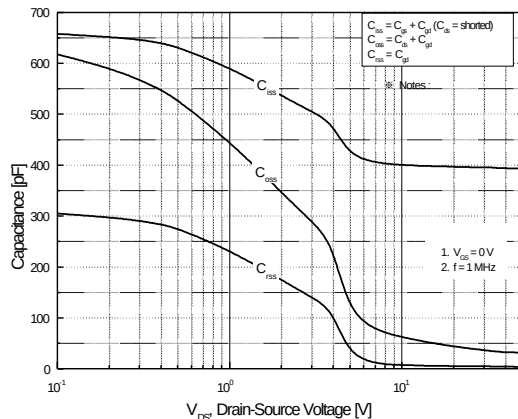


Figure 5. Capacitance Characteristics

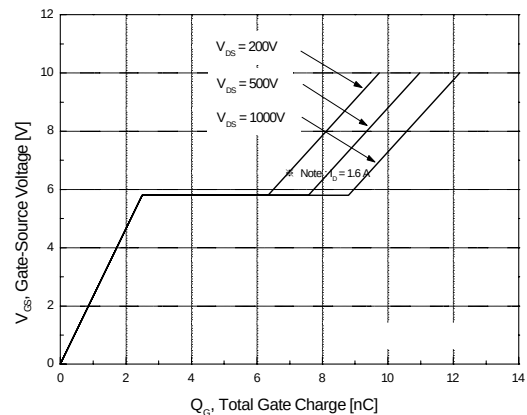


Figure 6. Gate Charge Characteristics

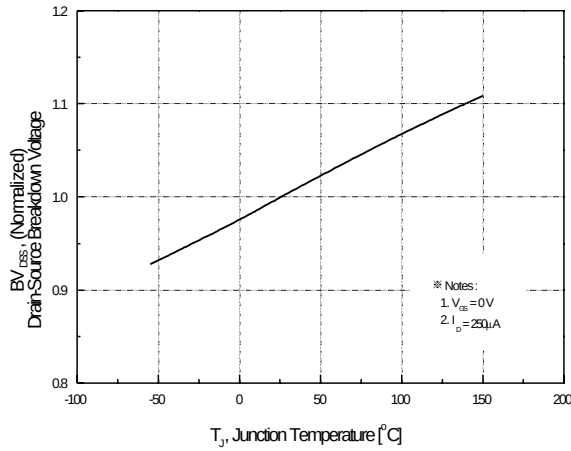


Figure 7. Breakdown Voltage Variation vs. Temperature

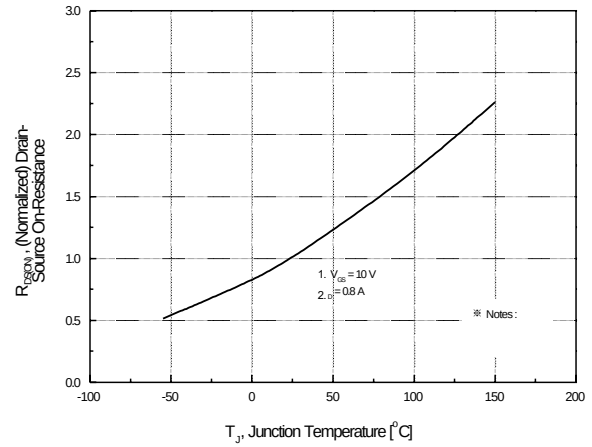


Figure 8. On-Resistance Variation vs. Temperature

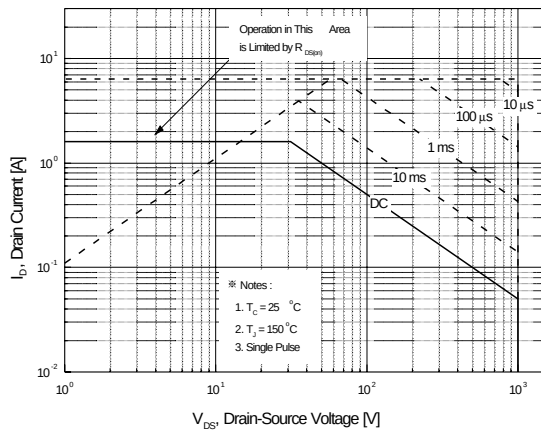


Figure 9. Maximum Safe Operating Area

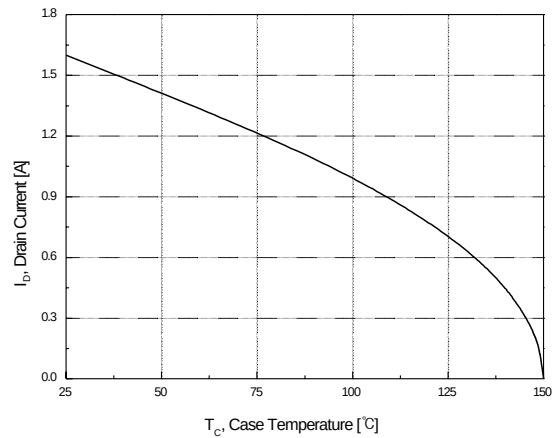


Figure 10. Maximum Drain Current vs. Case Temperature

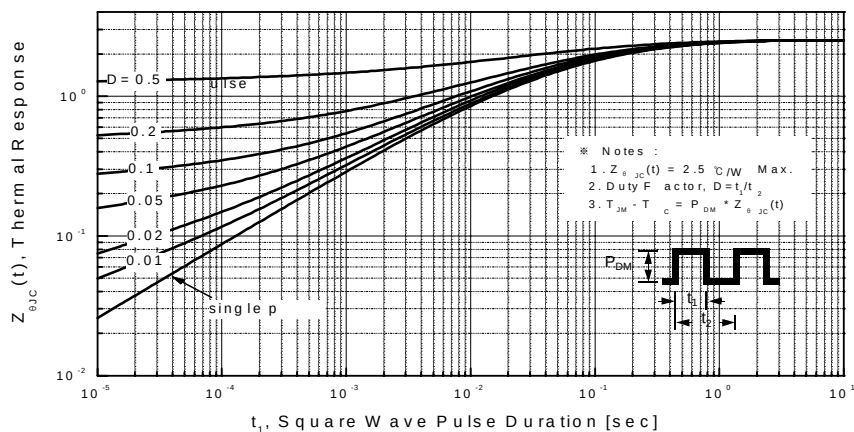
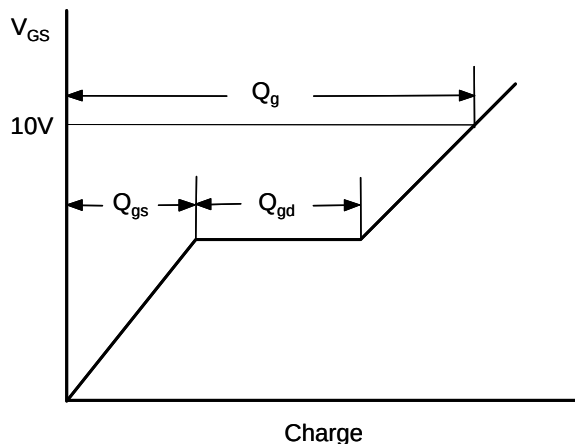
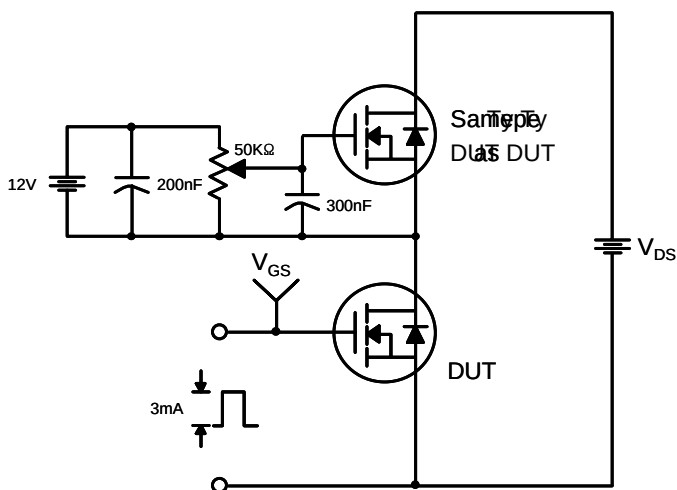
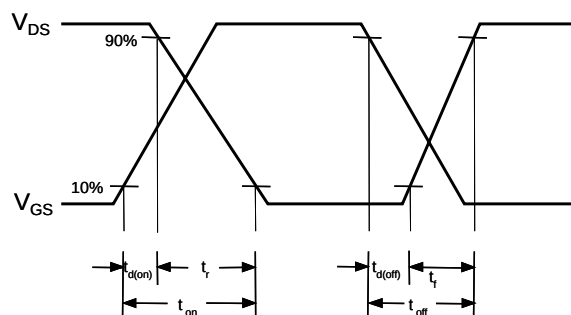
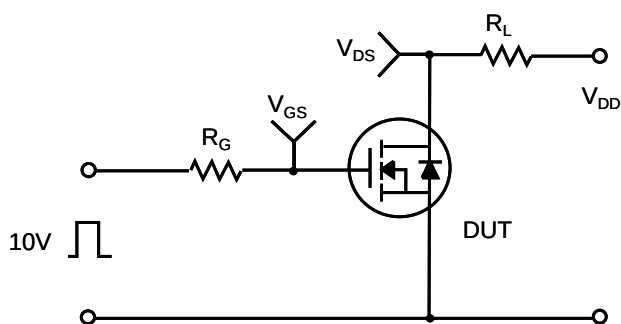


Figure 11. Transient Thermal Response Curve

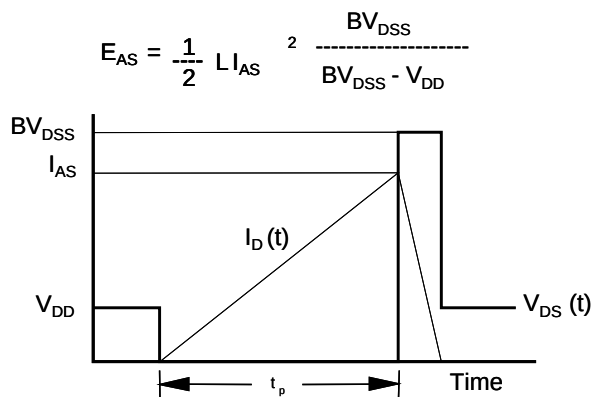
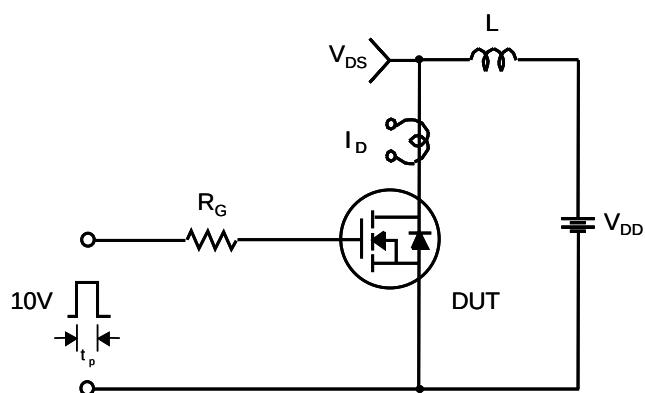
Gate Charge Test Circuit & Waveform



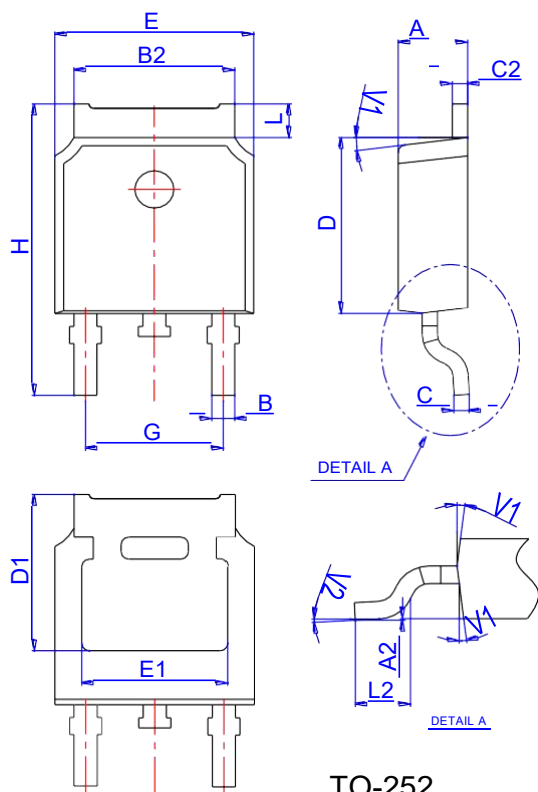
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

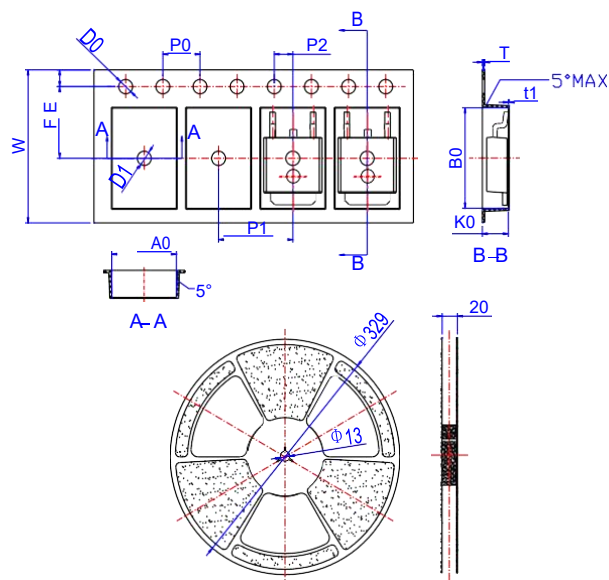


Package Mechanical Data-TO-252-JQ Single



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Reel Specification-TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583