General Description

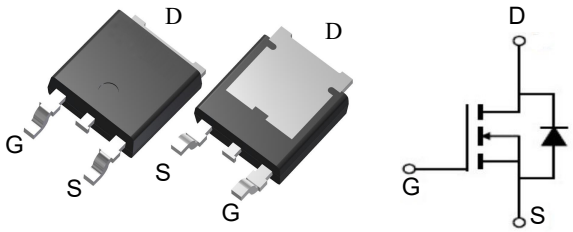
The MY12N10D use advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

Features

V_{DSS}	100	V
I_D	12	A
$R_{DS(ON)}$(atV_{GS} =10V)	<140	mΩ
$R_{DS(ON)}$(atV_{GS} =4.5V)	<180	mΩ

Application

- Uninterruptible power supply
- Power switching application
- Hard switched
- high frequency circuits



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
MY12N10D	TO-252-2L	MY12N10D	2500

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain source voltage	V_{DS}	100	V
Gate source voltage	V_{GS}	±20	V
Continuous drain current[1], T_C=25 ℃	I_D	12	A
Pulsed drain current[2], T_C=25 ℃	$I_{D, pulse}$	24	A
Power dissipation[3], T_C=25 ℃	P_D	17	W
Single pulsed avalanche energy[5]	E_{AS}	1.2	mJ
Operation and storage temperature	T_{stg}, T_j	-55 to 150	℃
Thermal resistance, junction-case	$R_{\theta JC}$	7.4	℃/W
Thermal resistance, junction-ambient[4]	$R_{\theta JA}$	62	℃/W

Electrical Characteristics (T_A=25 ℃, unless otherwise noted)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-source breakdown voltage	V_{GS}=0 V, I_D=250 μA	100			V
$V_{GS(th)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250 μA	1.2	1.5	2.5	V
$R_{DS(ON)}$	Drain-source on-state resistance	V_{GS}=10 V, I_D=5 A		110	140	mΩ
$R_{DS(ON)}$	Drain-source on-state resistance	V_{GS}=4.5 V, I_D=3 A		140	180	mΩ
I_{GSS}	Gate-source leakage current	V_{GS}=20 V			100	nA
		V_{GS}=-20 V			-100	
I_{DSS}	Drain-source leakage current	V_{DS}=100 V, V_{GS}=0 V			1	uA
C_{iss}	Input capacitance	V_{GS}=0 V, V_{DS}=50 V, f=100 kHz		206.1		pF
C_{oss}	Output capacitance			28.9		pF
C_{rss}	Reverse transfer capacitance			1.4		pF
$t_{d(on)}$	Turn-on delay time	V_{GS}=10 V, V_{DS}=50 V, R_G=2 Ω, I_D=5 A		14.7		ns
t_r	Rise time			3.5		ns
$t_{d(off)}$	Turn-off delay time			20.9		ns
t_f	Fall time			2.7		ns
Q_g	Total gate charge	I_D=5 A, V_{DS}=50 V, V_{GS}=10 V		4.3		nC
Q_{gs}	Gate-source charge			1.5		nC
Q_{gd}	Gate-drain charge			1.1		nC
$V_{plateau}$	Gate plateau voltage			5.0		V
I_S	Diode forward current	V_{GS}<V_{th}			7	A
I_{SP}	Pulsed source current				21	
V_{SD}	Diode forward voltage	I_S=7 A, V_{GS}=0 V			1.0	V
t_{rr}	Reverse recovery time	I_S=5 A, di/dt=100 A/μs		32.1		ns
Q_{rr}	Reverse recovery charge			39.4		nC
I_{rrm}	Peak reverse recovery current			2.1		A

Note

1) Calculated continuous current based on maximum allowable junction temperature.
2) Repetitive rating; pulse width limited by max. junction temperature.
3) Pd is based on max. junction temperature, using junction-case thermal resistance.
4) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 °C.
5) V_{DD}=50 V, R_G=50 Ω, L=0.3 mH, starting T_j=25 °C.

Typical Characteristics

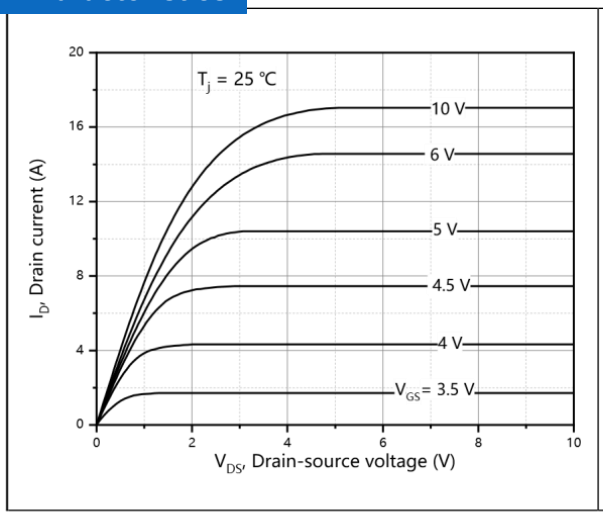


Figure 1, Typ. output characteristics

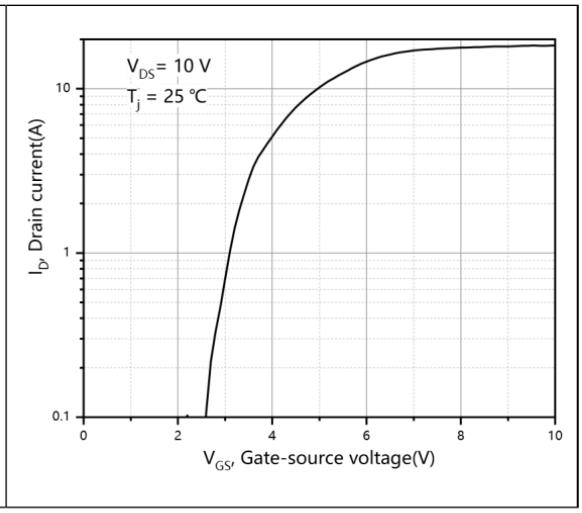


Figure 2, Typ. transfer characteristics

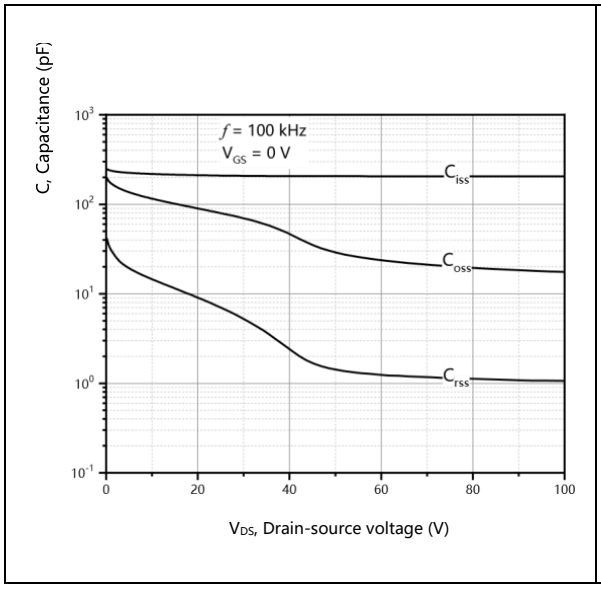


Figure 3, Typ. capacitances

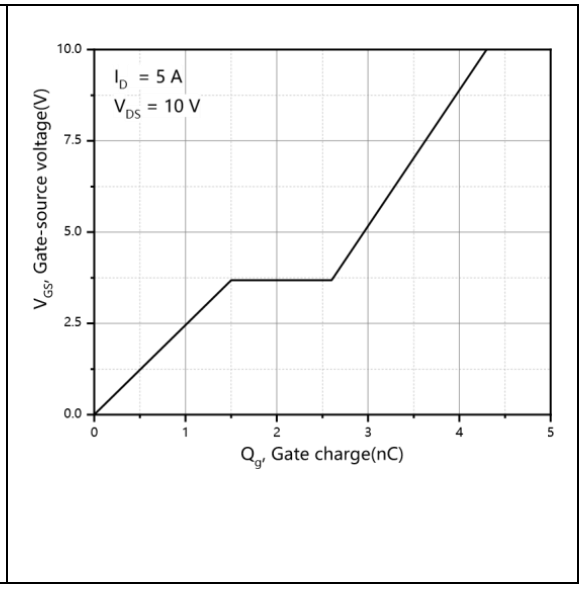


Figure 4, Typ. gate charge

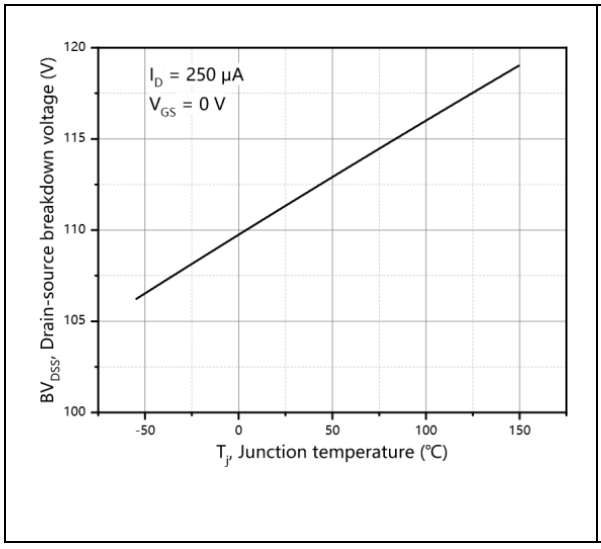


Figure 5, Drain-source breakdown voltage

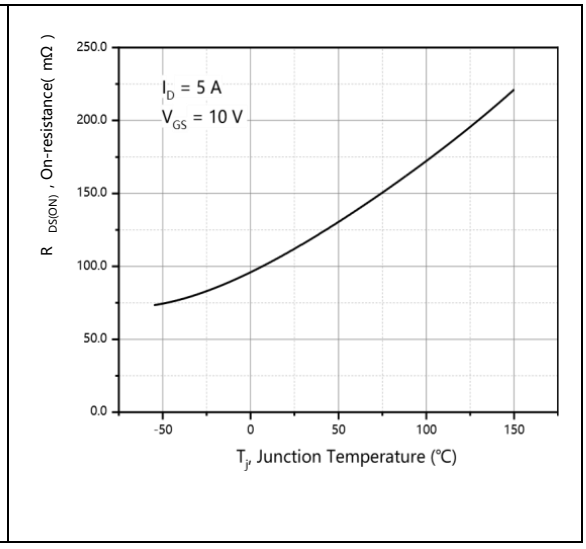


Figure 6, Drain-source on-state resistance

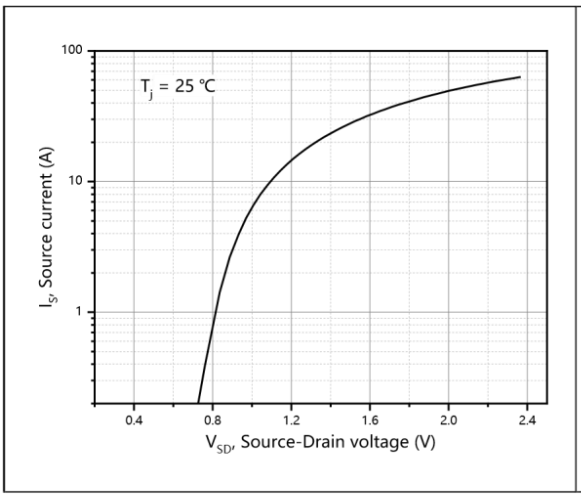


Figure 7, Forward characteristic of body diode

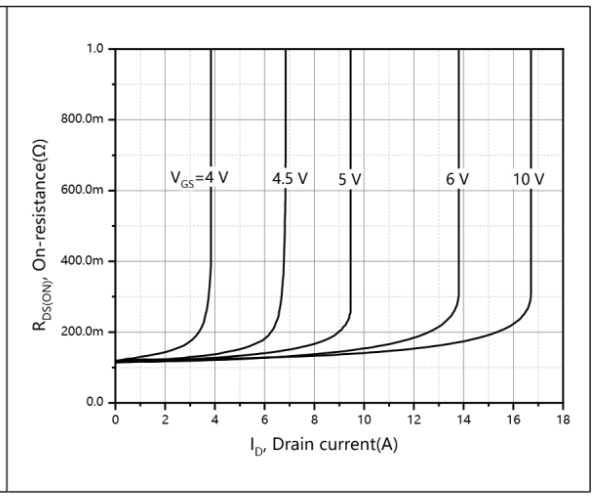


Figure 8, Drain-source on-state resistance

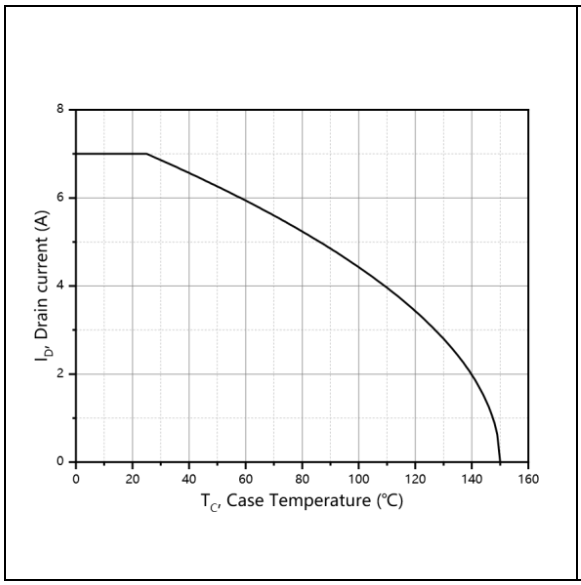


Figure 9, Drain current

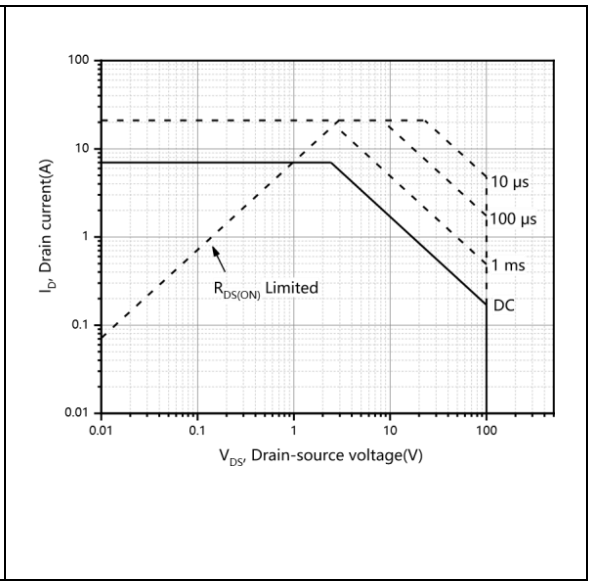


Figure 10, Safe operation area T_C=25 ℃

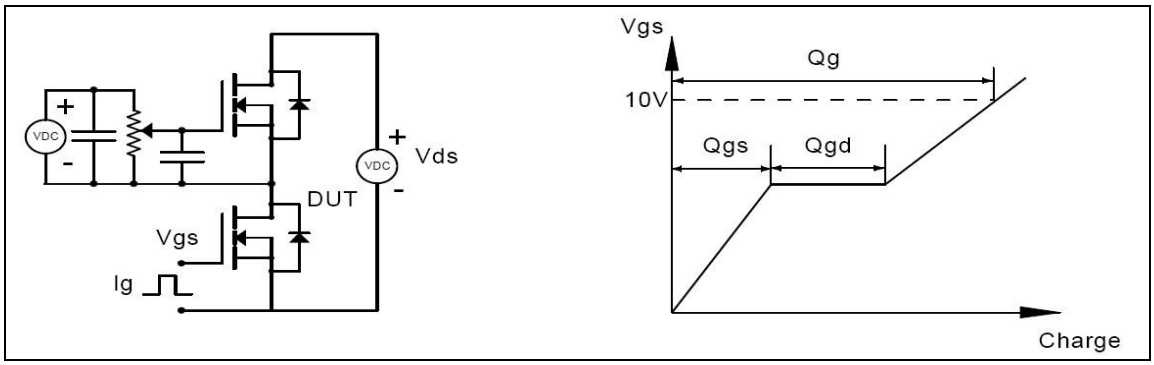


Figure 1, Gate charge test circuit & waveform

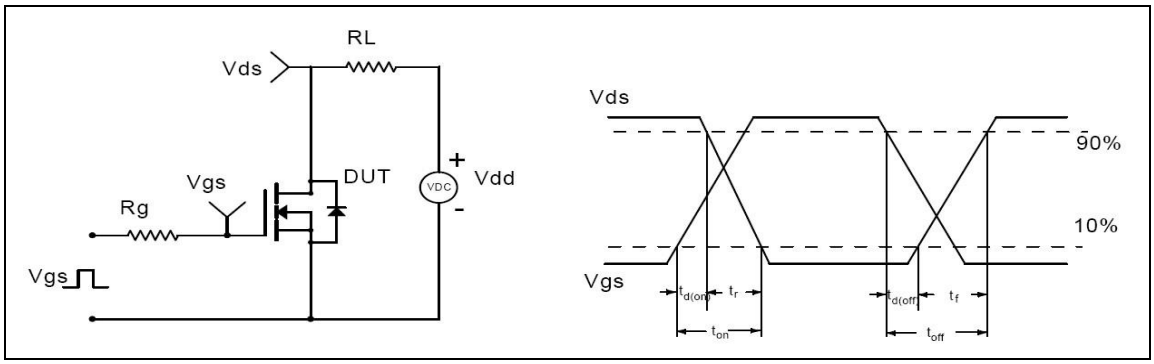


Figure 2, Switching time test circuit & waveforms

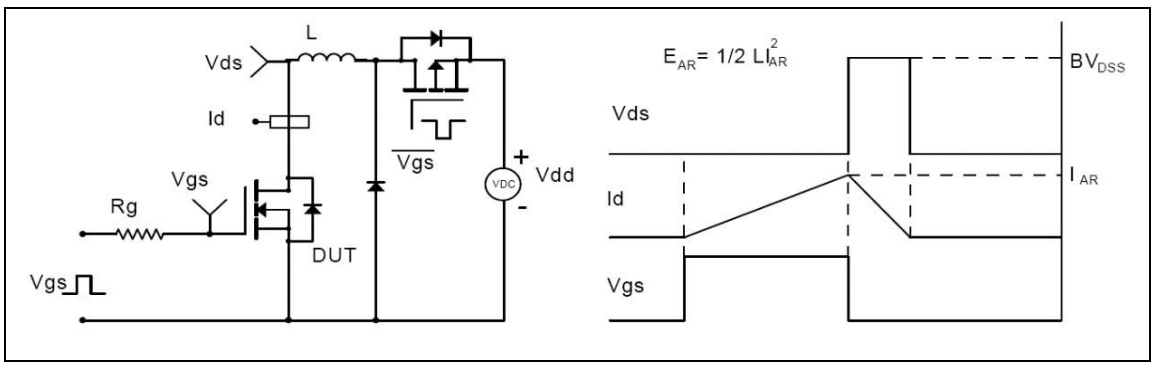


Figure 3, Unclamped inductive switching (UIS) test circuit & waveforms

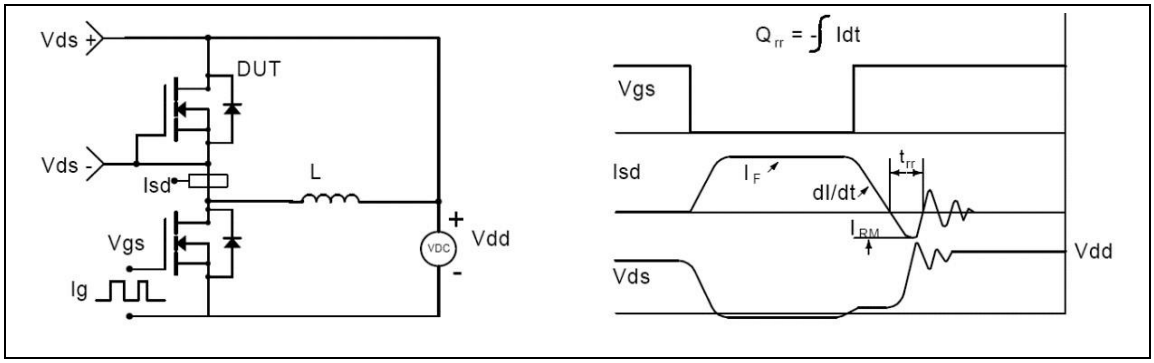
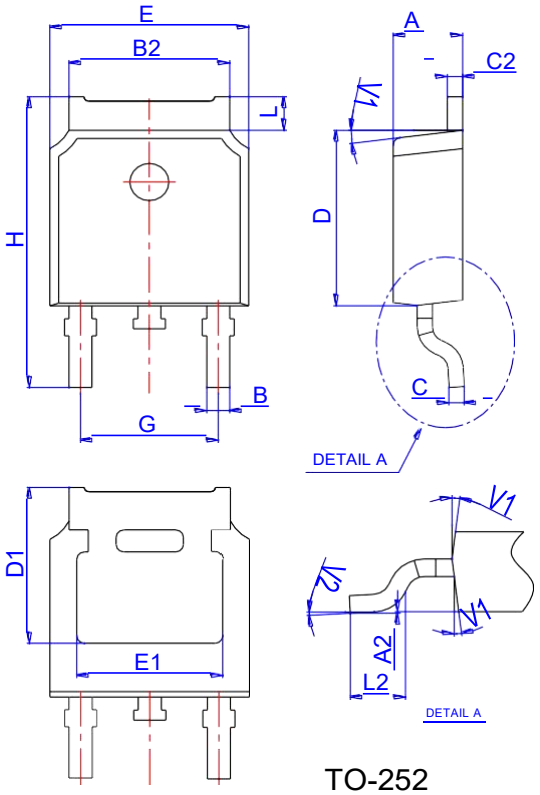


Figure 4, Diode reverse recovery test circuit & waveforms

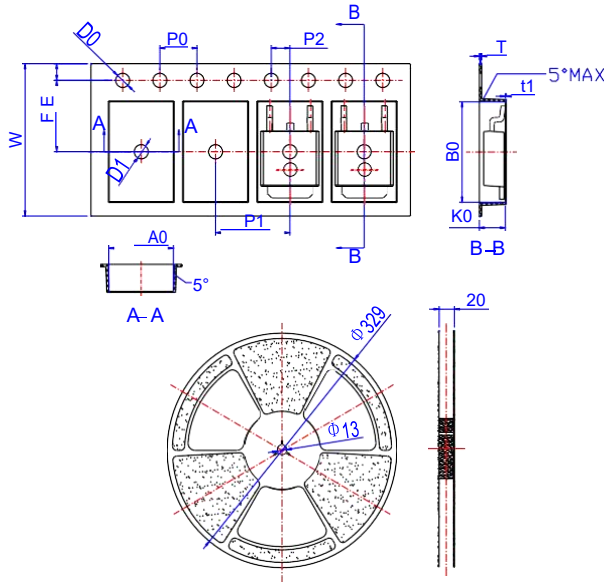
Package Mechanical Data-TO-252-JQ Single



TO-252

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