

General Description

The MY50P06D uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V.

This device is suitable for use as a Battery protection or in other Switching application.

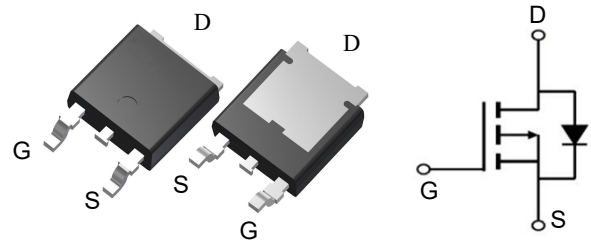


Features

V_{DSS}	-60	V
I_D	-50	A
$P_D(T_C=25^\circ\text{C})$	130	W
$R_{DS(ON)}(at V_{GS}=10V)$	14	$m\Omega$

Application

- Battery protection
- Load switch
- Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
MY50P06D	TO-252-2L	MY50P06D	2500

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	-50	A
Drain Current-Continuous($T_C=100^\circ\text{C}$)	$I_D(100^\circ\text{C})$	-42.3	A
Pulsed Drain Current	I_{DM}	-260	A
Maximum Power Dissipation	P_D	130	W
Derating factor		0.87	$W/^\circ\text{C}$
Single pulse avalanche energy (Note 5)	E_{AS}	722	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 175	$^\circ\text{C}$
Thermal Resistance, Junction-to-Case (Note 2)	$R_{\theta JC}$	1.15	$^\circ\text{C/W}$

Electrical Characteristics ($T_A=25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-60V, V_{GS}=0V$	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-2.0	-2.6	-3.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-20A$	-	14	17	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-5V, I_D=-20A$	-	25	-	S
Input Capacitance	C_{iss}	$V_{DS}=-25V, V_{GS}=0V,$ $F=1.0MHz$	-	5814	-	PF
Output Capacitance	C_{oss}		-	483	-	PF
Reverse Transfer Capacitance	C_{rss}		-	234	-	PF
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-30V, R_L=1.5\Omega,$ $V_{GS}=-10V, R_G=3\Omega$	-	18	-	nS
Turn-on Rise Time	t_r		-	20	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	55	-	nS
Turn-Off Fall Time	t_f		-	35	-	nS
Total Gate Charge	Q_g	$V_{DS}=-30, I_D=-20A,$ $V_{GS}=-10V$	-	75		nC
Gate-Source Charge	Q_{gs}		-	16		nC
Gate-Drain Charge	Q_{gd}		-	19		nC
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=-20A$	-		-1.2	V
Diode Forward Current (Note 2)	I_S		-	-	-65	A
Reverse Recovery Time	t_{rr}	$T_J = 25^\circ\text{C}, I_F = -20A$ $di/dt = -100A/\mu s^{(Note3)}$	-	49		nS
Reverse Recovery Charge	Q_{rr}		-	71		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, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production
5. E_{AS} condition: $T_J=25^\circ\text{C}, V_{DD}=-30V, V_{GS}=-10V, L=0.5mH, R_g=25\Omega$ Typical Electrical and Thermal Characteristics (Curves)

Typical Characteristics

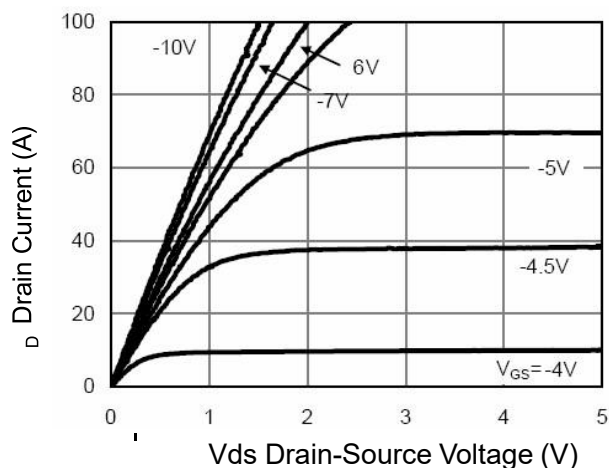


Figure 1 Output

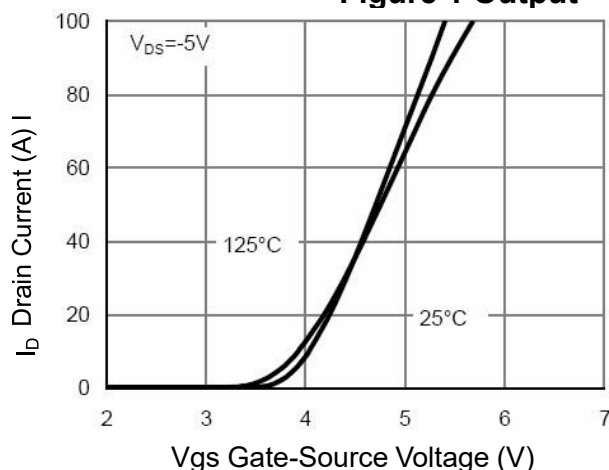


Figure 2 Transfer

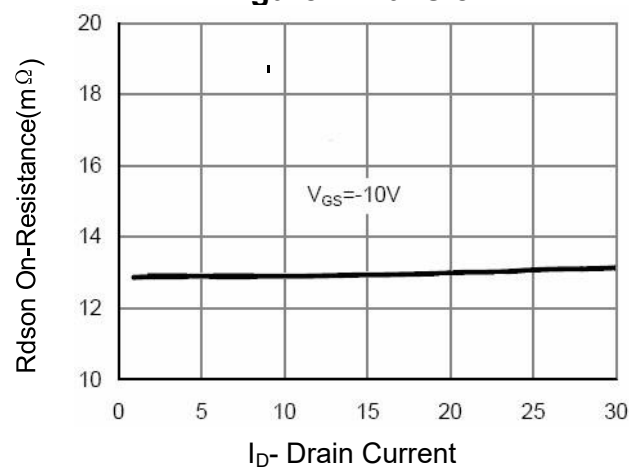


Figure 3
 $R_{DS(on)}$ vs. I_D

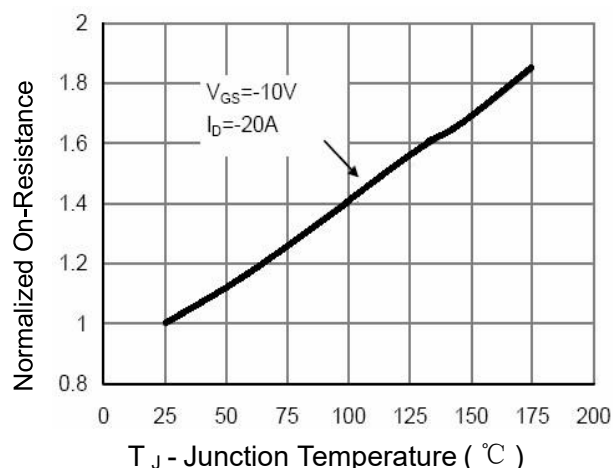


Figure 4 $R_{DS(on)}$ -Junction

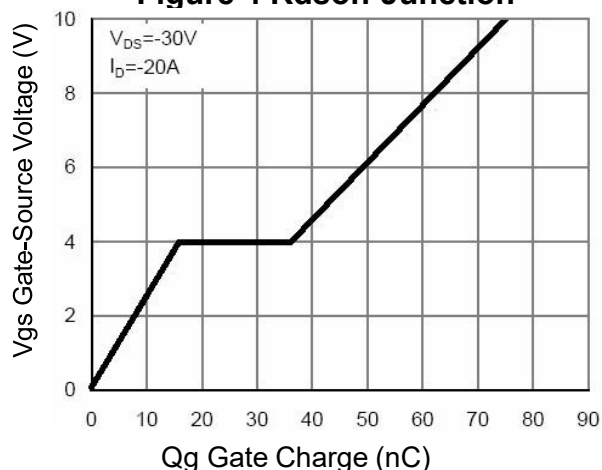


Figure 5 Gate

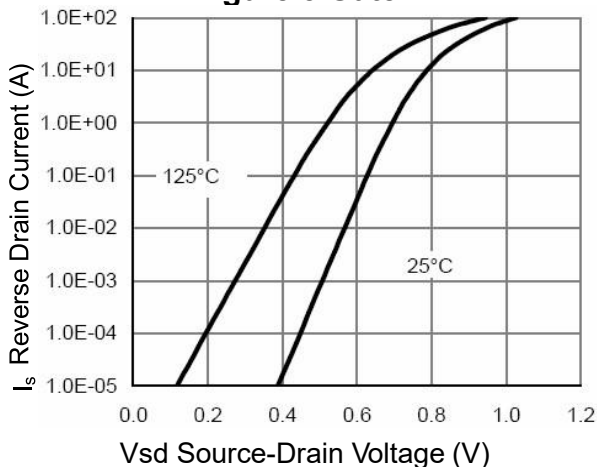


Figure 6 Source- Drain Diode Forward

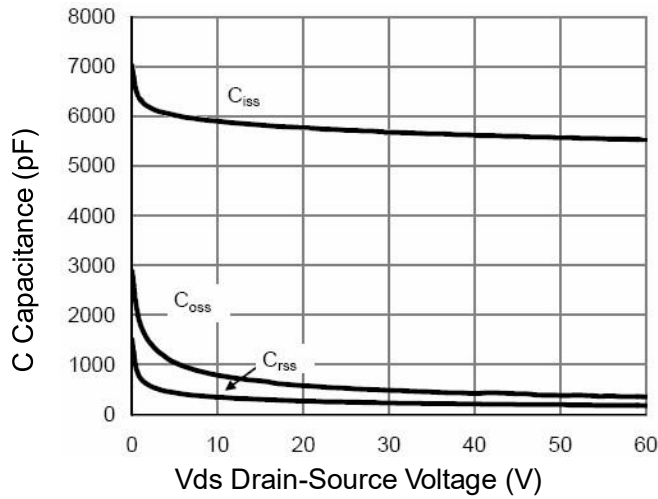


Figure 7 Capacitance vs Vds

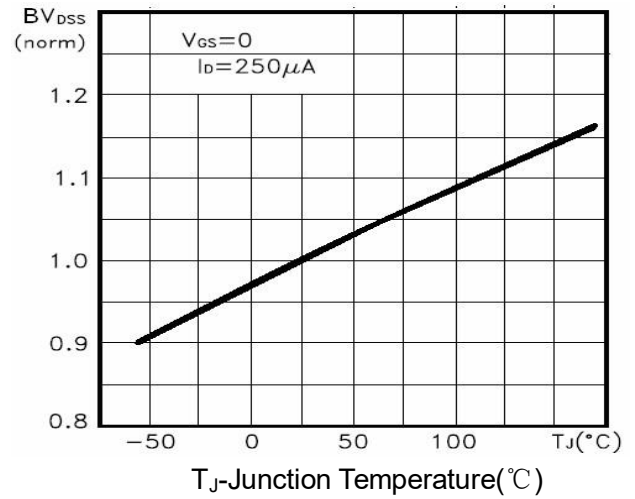


Figure 9 BV_{DSS} vs Junction Temperature

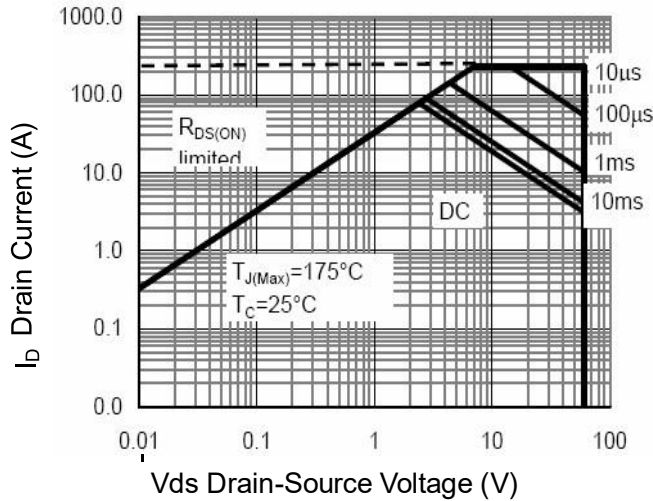


Figure 8 Safe Operation Area

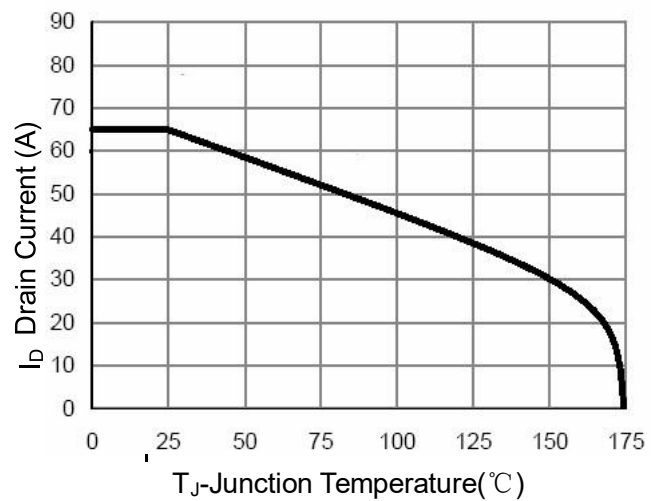


Figure 10 ID Current Derating vs Junction Temperature

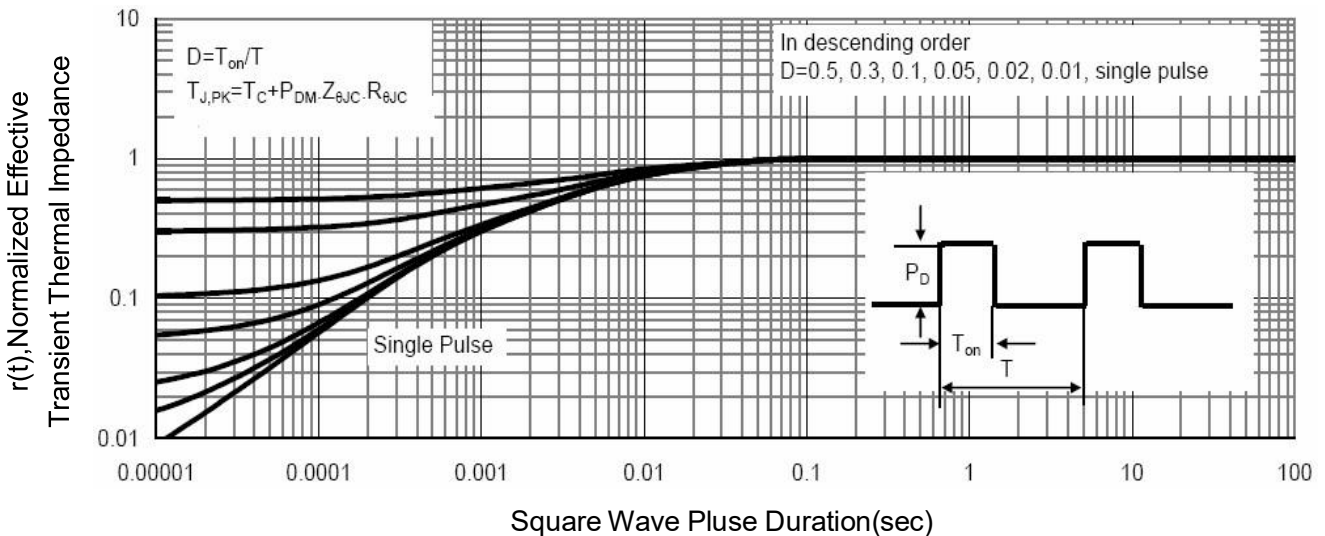


Figure 11 Normalized Maximum Transient Thermal Impedance

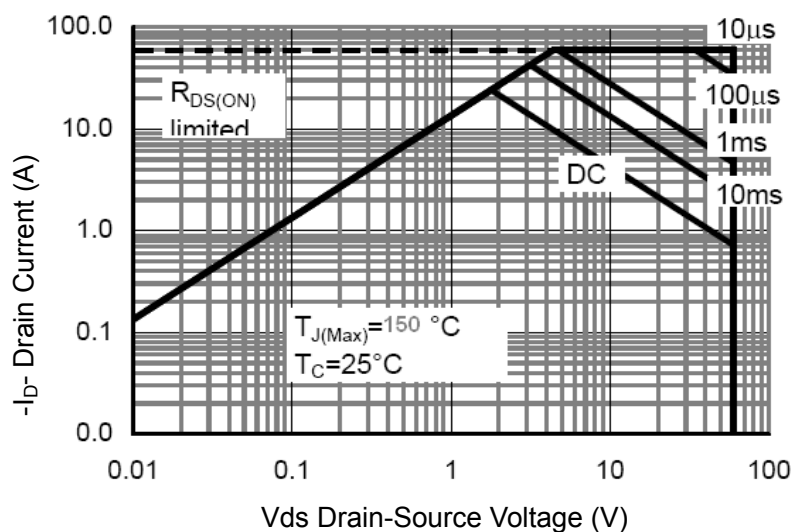


Figure 13 Safe Operation Area

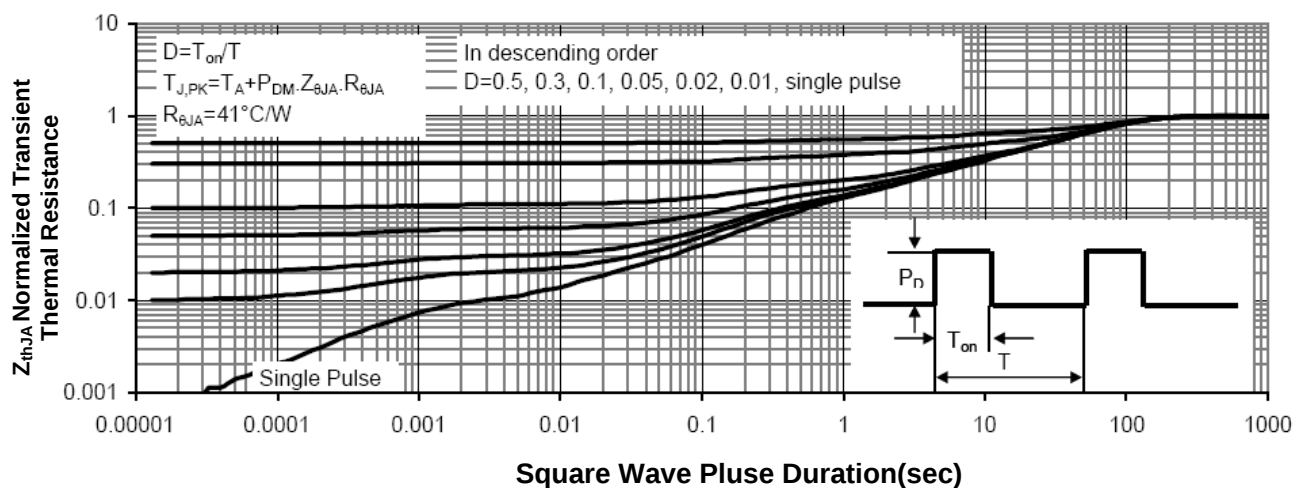
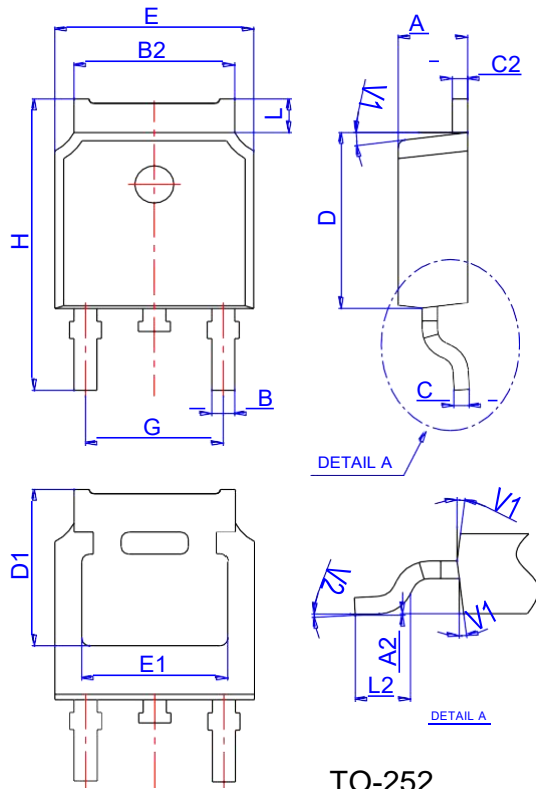


Figure 14 Normalized Maximum Transient Thermal Impedance

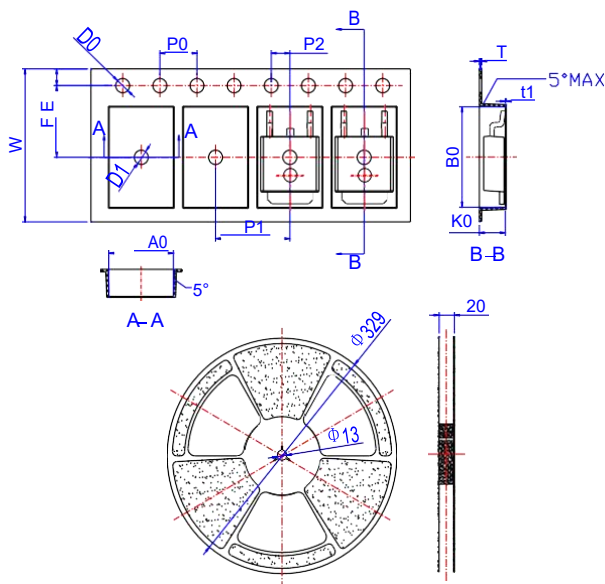
Package Mechanical Data-TO-252-JQ Single



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