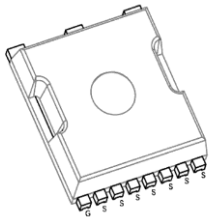
GPT023N10NTP

100V N-Channel MOSFET

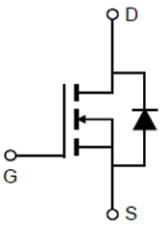
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
100V	2.5mΩ@10V	210A

TOLL



Schematic diagram



Feature

- Split Gate Trench Technology
- Low $R_{DS(ON)}$
- Low Gate Charge
- Low Gate Resistance
- 100% UIS Tested

Application

- Power Management
- Motor Driving
- High frequency switching, synchronous rectification

Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Tape Width	Qty
GPT023N10NTP	TOLL	T023N10N	Reel & Tape	330mm	24mm	2000pcs

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C 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°C	I_D	210	A
	T_C = 100°C		132	
Pulsed Drain Current[2]		I_{DM}	840	A
Single Pulsed Avalanche Current[3]		I_{AS}	63	A
Single Pulsed Avalanche Energy[3]		E_{AS}	992	mJ
Power Dissipation[5]	T_C = 25°C	P_D	277	W
Thermal Resistance from Junction to Ambient[6]		$R_{\theta JA}$	35	°C/W
Thermal Resistance from Junction to Case		$R_{\theta JC}$	0.45	°C/W
Junction Temperature		T_J	150	°C
Storage Temperature		T_{STG}	-55~ +150	°C

MOSFET ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100V, V_{GS} = 0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
On Characteristics[4]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0	3.0	4.0	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A		2.5	3.0	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 50V, V_{GS} = 0V, f = 1MHz		7376		pF
Output Capacitance	C_{oss}			955		
Reverse Transfer Capacitance	C_{rss}			45		
Gate Resistance	R_g	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz		1.0		Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = 50V, V_{GS} = 10V, I_D = 50A		124		nC
Gate-Source Charge	Q_{gs}			32		
Gate-Drain Charge	Q_{gd}			36		
Gate Plateau Voltage	$V_{plateau}$			4.8		V
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 50V, V_{GS} = 10V, I_D = 80A, R_G = 3Ω		10		ns
Turn-On Rise Time	t_r			28		
Turn-Off Delay Time	$t_{d(off)}$			40		
Turn-Off Fall Time	t_f			25		
Source-Drain Diode Characteristics						
Diode Forward Voltage[4]	V_{SD}	V_{GS} = 0V, I_S = 20A			1.2	V
Diode Continuous Forward Current[1]	I_S	T_C = 25℃			210	A
Diode Pulse Forward Current[2]	I_{SM}	T_C = 25℃			840	A
Diode Reverse Recovery Time	t_{rr}	I_F = 80A, dI/dt = 100A/μs		55		ns
Diode Reverse Recovery Charge	Q_{rr}	I_F = 80A, dI/dt = 100A/μs		95		nC

Notes:

1.The maximum current rating is limited by package. And device mounted on a large heatsink.

2.Pulse Test: Pulse Width ≤ 10μs, duty cycle ≤ 1%.

3.E_{AS} condition: V_{DD} = 50V, V_{GS} = 10V, L = 0.5mH, R_G = 25Ω Starting T_J = 25°C.

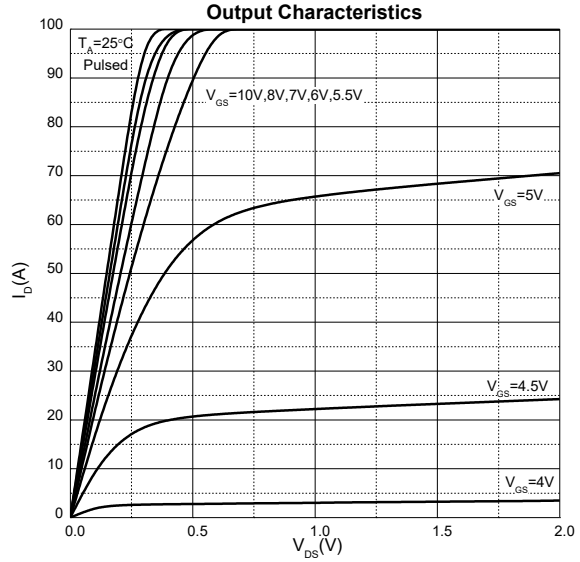
4.Pulse Test: Pulse Width ≤ 300μs, duty cycle ≤ 2%.

5.The power dissipation P_D is limited by $T_{J(MAX)}$ = 150°C. And device mounted on a large heatsink.

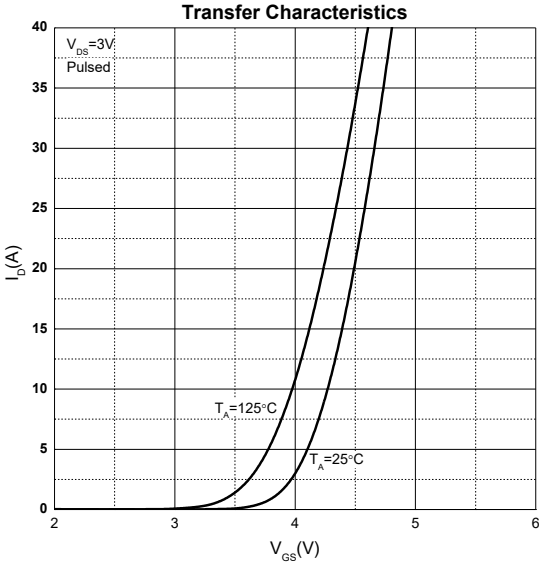
6.Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A = 25°C.

Typical Characteristics

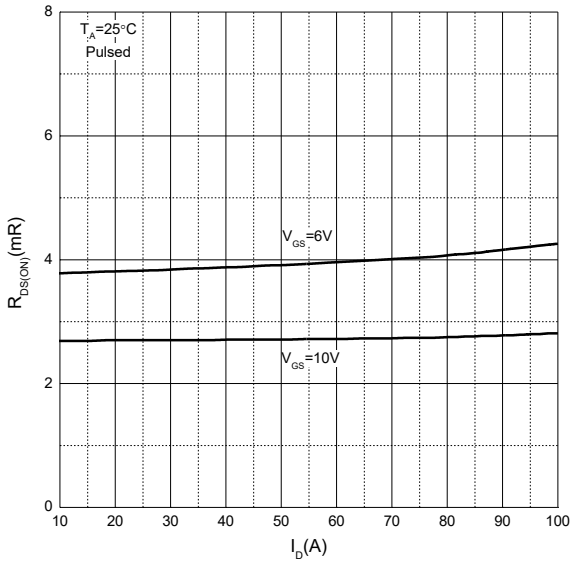
Output Characteristics



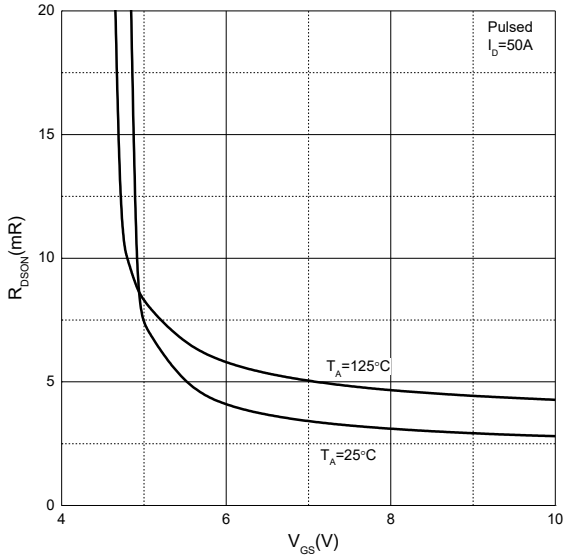
Transfer Characteristics



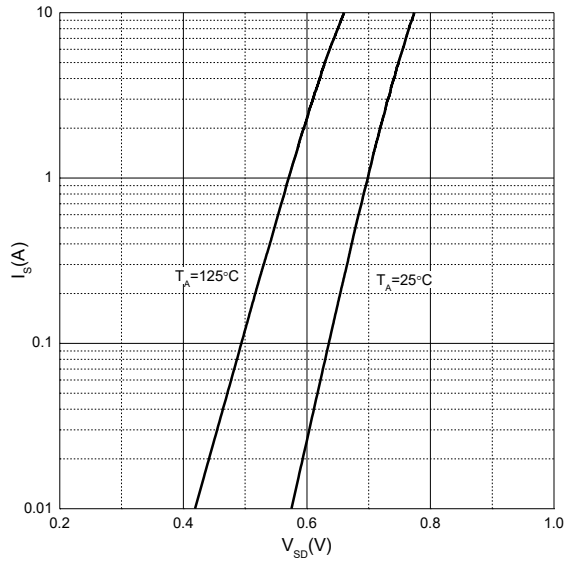
$R_{DS(ON)}$ vs I_D



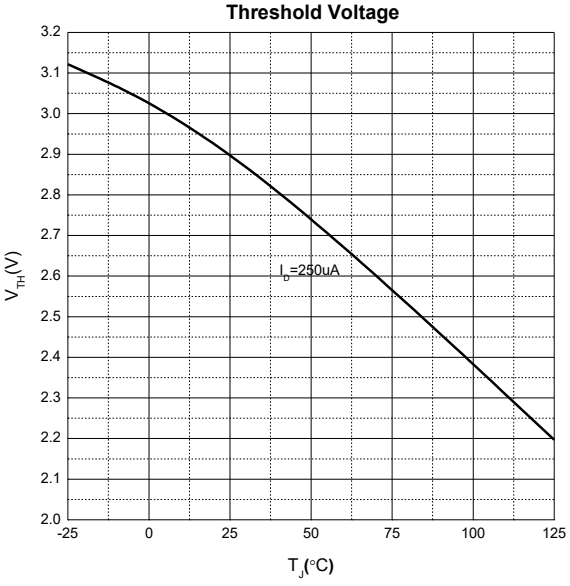
$R_{DS(ON)}$ vs V_{GS}



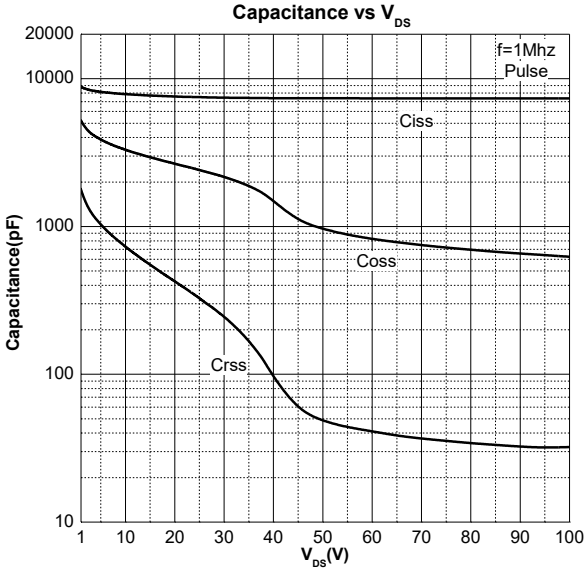
I_S vs V_{SD}



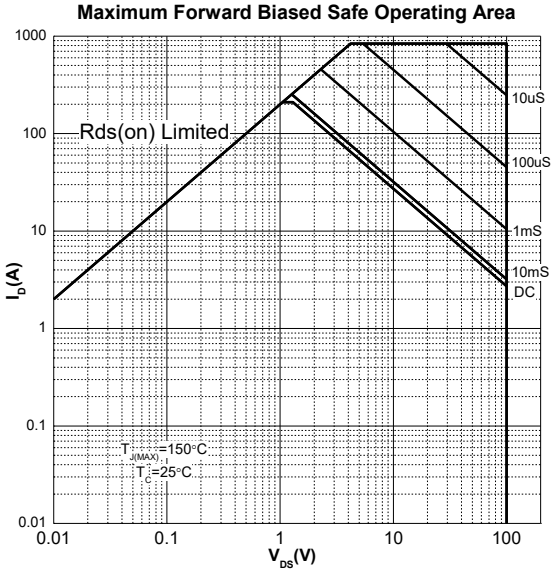
Threshold Voltage



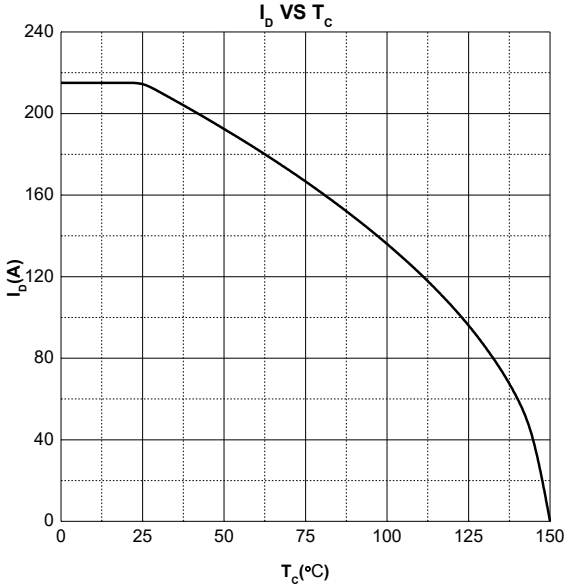
Capacitance vs V_{DS}



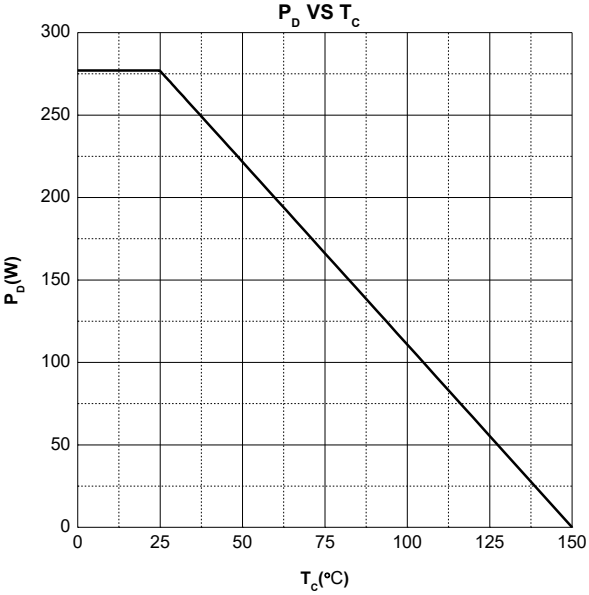
Maximum Forward Biased Safe Operating Area



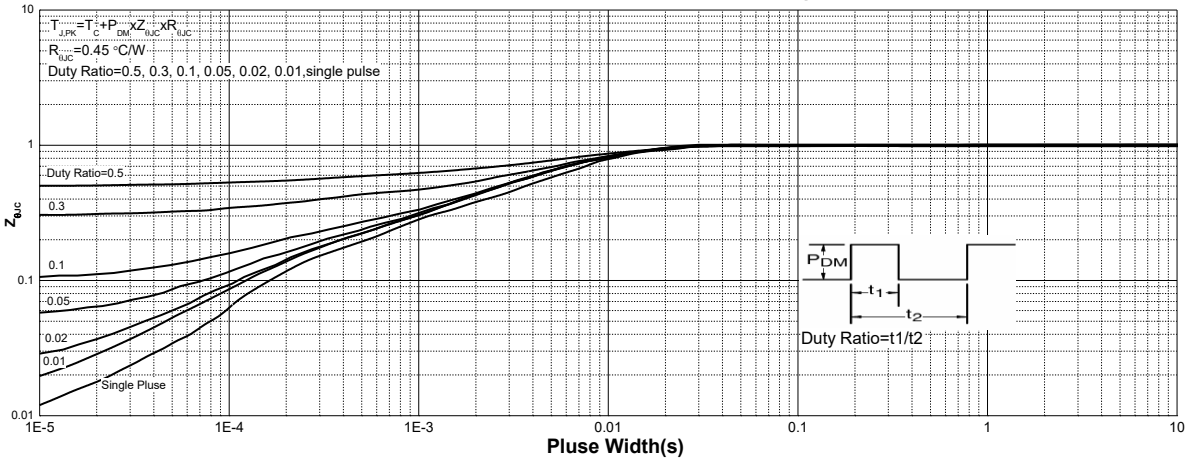
I_D VS T_C



P_D VS T_C

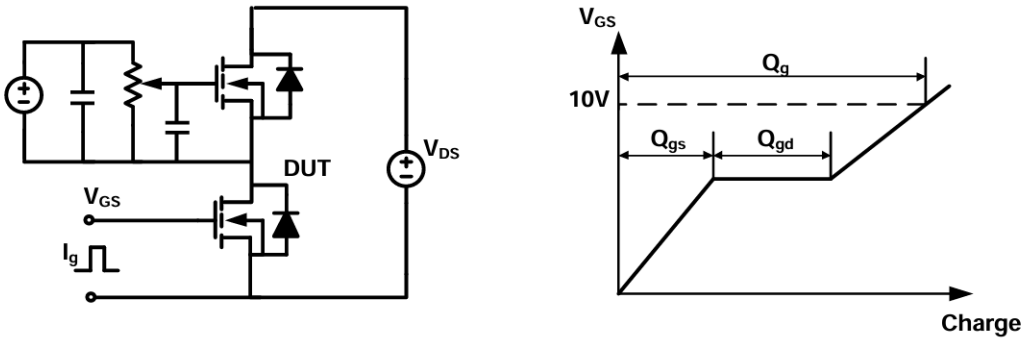


Normalized Maximum Transient Thermal Impedance

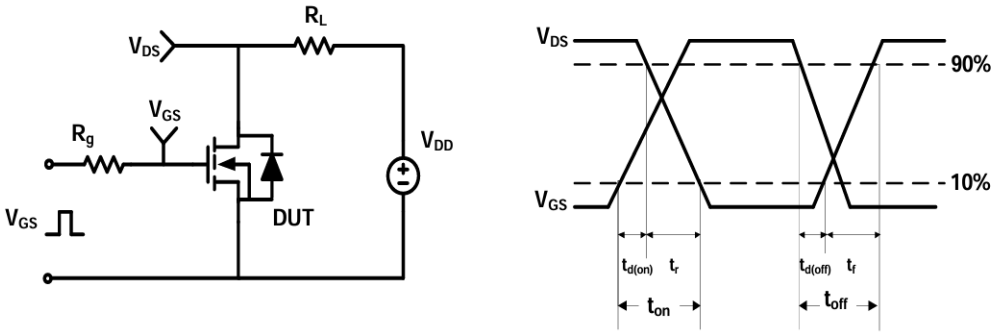


Test Circuit

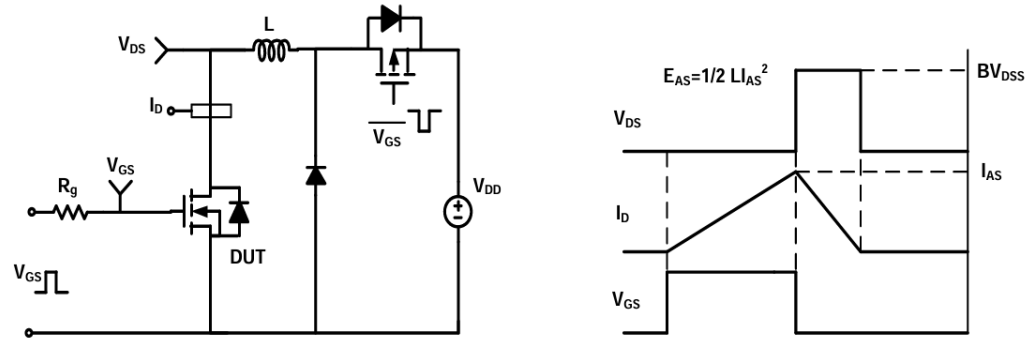
Gate Charge Test Circuit & Waveform



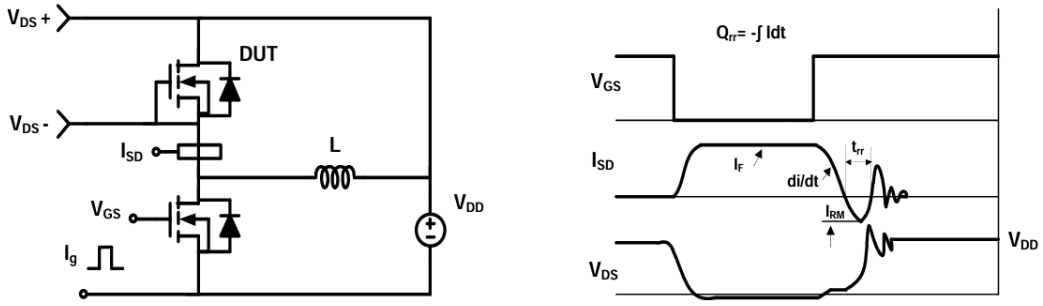
Resistive Switching Test Circuit & Waveform



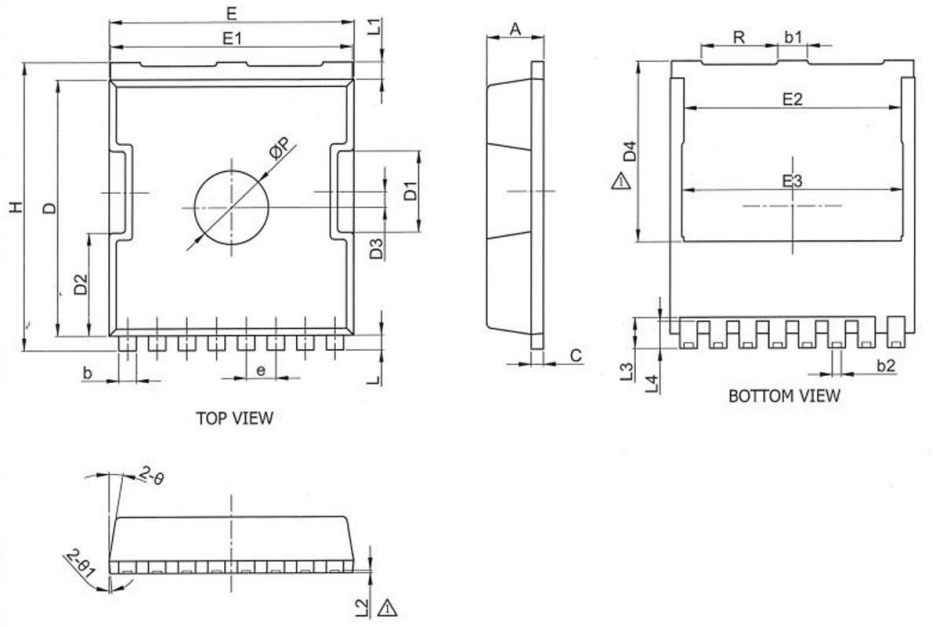
Unclamped Inductive Switching (UIS) Test Circuit & Waveform



Diode Recovery Test Circuit & Waveform



TOLL Package Information



SYMBOL	MILLIMETER		Dimensions In Inches	
	MIN.	MAX.	Min.	Max.
A	2.200	2.400	0.087	0.094
b	0.600	0.900	0.024	0.035
b1	1.100	1.300	0.043	0.051
b2	0.360 REF		0.014 REF	
C	0.400	0.600	0.016	0.024
D	10.300	10.500	0.406	0.413
D1	3.200	3.400	0.126	0.134
D2	4.080	4.280	0.161	0.169
D3	0.530	0.730	0.021	0.029
D4	7.350 REF		0.289 REF	
E	9.800	10.000	0.386	0.394
E1	9.700	9.900	0.382	0.390
E2	8.800 REF		0.346 REF	
E3	8.950 REF		0.352 REF	
e	1.200 BSC		0.047 BSC	
H	11.500	11.900	0.453	0.469
L	0.500	0.700	0.020	0.028
L1	0.600	0.800	0.024	0.031
L2	0.100 REF		0.004 REF	
L3	1.270 REF		0.050 REF	
L4	1.100 REF		0.043 REF	
P	2.000	4.000	0.079	0.157
R	3.000	3.200	0.118	0.126
θ	7°	11°	7°	11°
θ1	3°	7°	3°	7°

Attention：

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