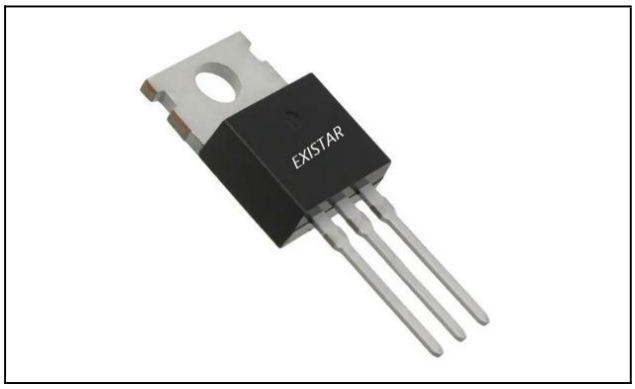
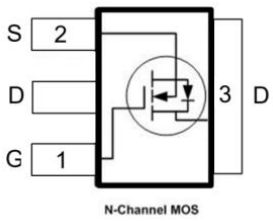
N-Channel 150V MOSFET

E150N020AH1

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
150V	20 @ V_{GS} = 10V	80

TO-220





Pb-free
RoHS
COMPLIANT
HALOGEN
FREE

Features

- Low $R_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested

Applications

- DC/DC conversion
- Power switch
- PD charger
- Moto driver

Package And Ordering Information

Ordering code	Package	Marking
E150N020AH1	TO-220	E150N020AH1

Ordering Information

Package	Units/ Tube	Tubes/ Inner Box	Units/ Inner Box
TO-220	50	20	1000

Key Performance Parameters

Parameter	Value	Unit
VDS, min @ Tj(max)	150	V
ID, pulse	318	A
RDS(ON), max @ VGS=10V	20	mΩ
Qg	19	nC

Absolute Maximum Ratings at Tj=25°C Unless Otherwise Noted

Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{DS}	150	V
Gate-source voltage		V_{GS}	±20	
Continuous drain current	T_C=25°C	I_D	80	A
	T_C=100°C		-	
Pulsed drain current		$I_{D,pulse}$	318	
Avalanche energy, single pulse		E_{AS}	160	mJ
Power dissipation	T_C=25°C	P_D	280	W
	T_A=25°C		-	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to 175	℃

Thermal Characteristics

Parameter		Symbol	Max.	Unit
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	0.95	°C/W
Thermal resistance, junction-to-ambient	Steady state	$R_{\theta JA}$	50	

Electrical Characteristics at Tj=25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Static						
Drain to source breakdown voltage	$V_{(BR)DSS}$	150			V	V_{GS} = 0, I_D = 250 μA
Gate-source threshold voltage	$V_{GS(th)}$	3.5	-	4.5	V	V_{DS} = V_{GS}, I_D = 250 μA
Gate-body leakage	I_{GSS}			±100	nA	V_{DS} = 0 V, V_{GS} = ±20 V
Zero gate voltage drain current	I_{DSS}			1	μA	V_{DS} = 150 V, V_{GS} = 0 V
Drain-source on-resistance	$R_{DS(on)}$		16	20	mΩ	V_{GS} = 10 V, I_D = 30 A
Gate resistance	Rg		0.9		Ω	f=1MHz

Gate Charge						
Total gate charge	Qg		19		nC	V_{DS} = 80 V, I_D = 40 A, V_{GS} = 10 V
Gate-source charge	Qgs		7			
Gate-drain charge	Qgd		7			
Dynamic						
Turn-on delay time	$t_{d(on)}$		13		ns	V_{DS} = 80 V, I_D =40 A, V_{GS} = 10 V, R_{GEN} = 2 Ω
Rise time	t_r		7			
Turn-off delay time	$t_{d(off)}$		16			
Fall time	t_f		6			
Input capacitance	C_{iss}		1280		pF	V_{DS} =75V, V_{GS} = 0 V, f = 100kHz
Output capacitance	C_{oss}		427			
Reverse transfer capacitance	C_{rss}		17			
Body Diode						
Diode forward voltage	V_{SD}			1.1	V	V_{GS} = 0 V, I_F = 30 A
Reverse recovery time	t_{rr}		52		ns	V_R= 80 V, I_S =40 A, di/dt = 400 A/μs
Reverse recovery charge	Q_{rr}		231		nC	
Peak reverse recovery current	I_{rrm}		7.4		A	

Electrical Characteristics Diagrams

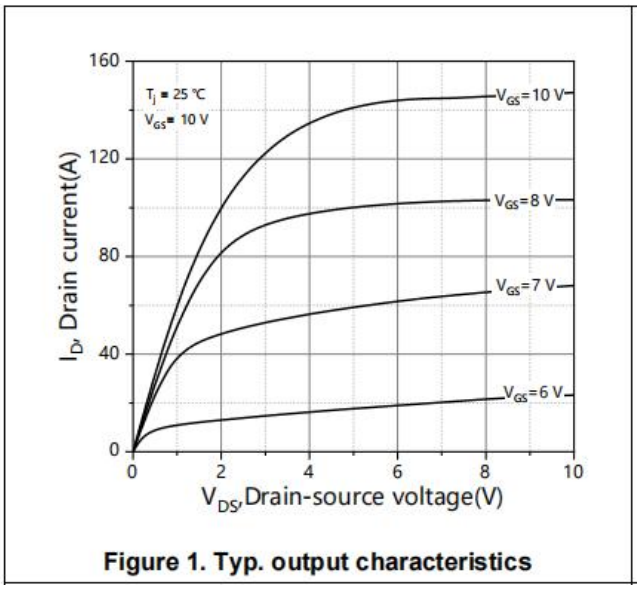


Figure 1. Typ. output characteristics

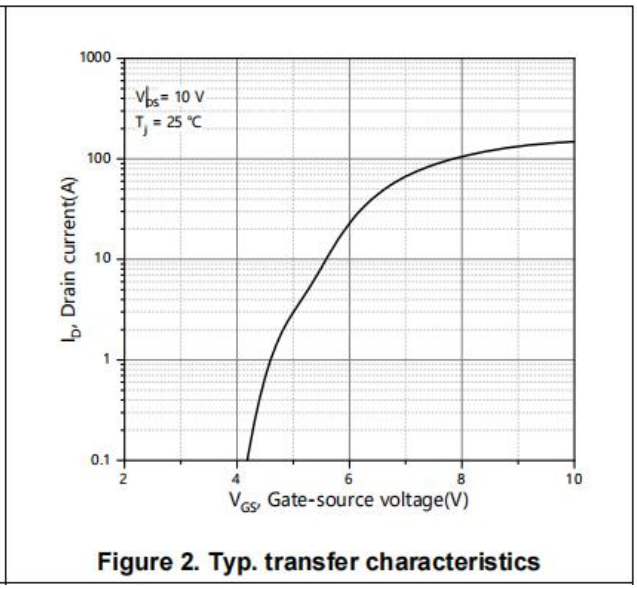


Figure 2. Typ. transfer characteristics

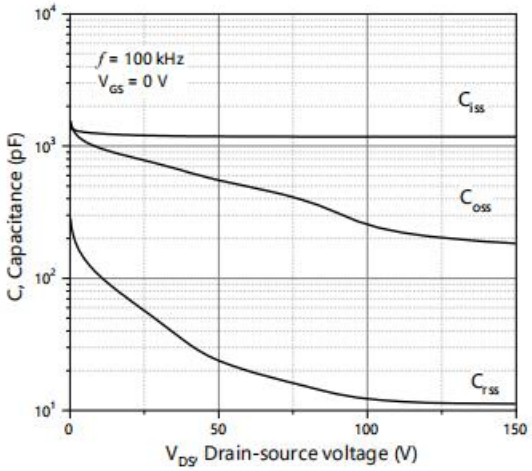


Figure 3. Typ. capacitances

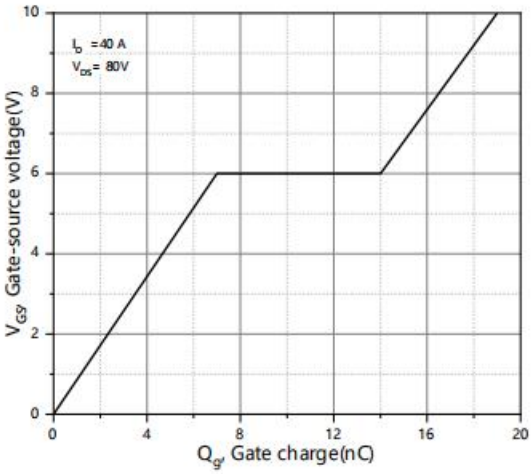


Figure 4. Typ. gate charge

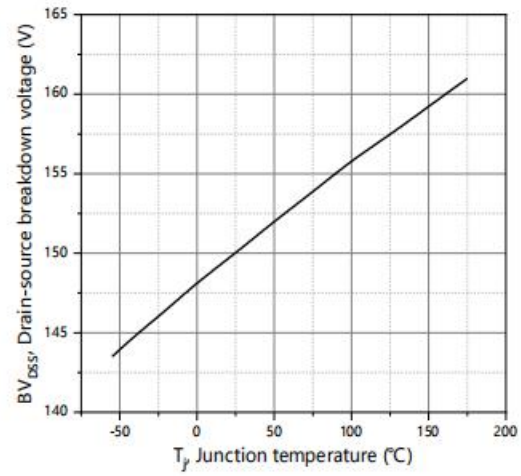


Figure 5. Drain-source breakdown voltage

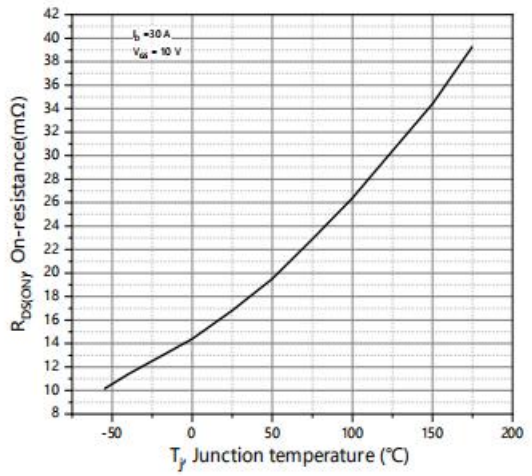


Figure 6. Drain-source on-state resistance

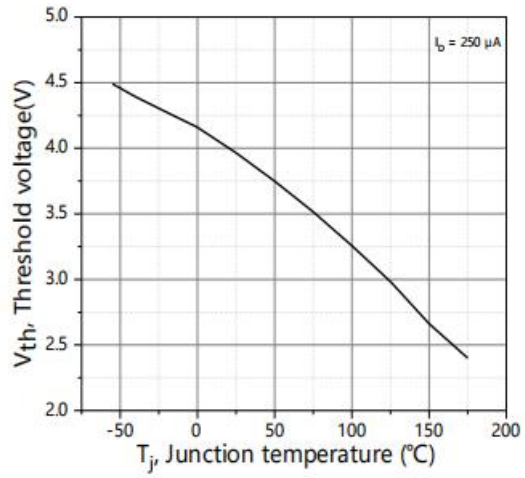


Figure 7. Threshold voltage

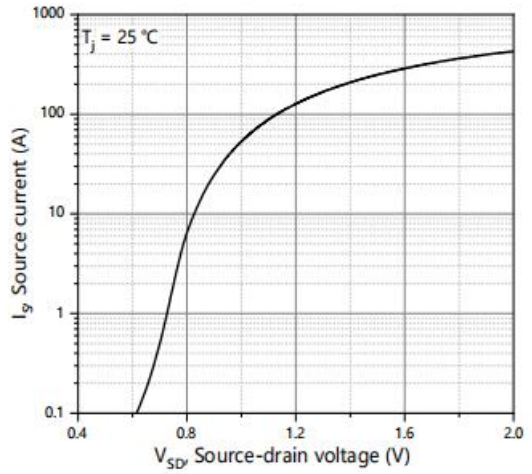


Figure 8. Forward characteristic of body diode

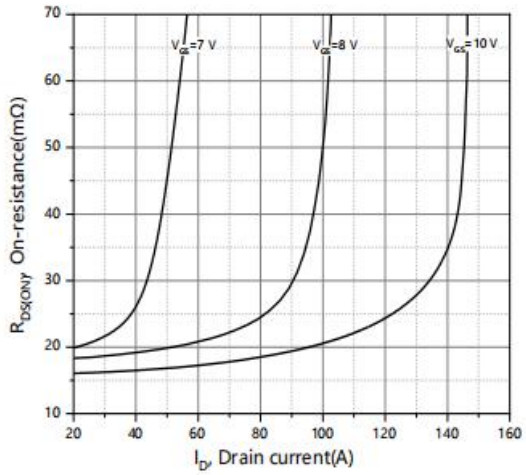


Figure 9. Drain-source on-state resistance

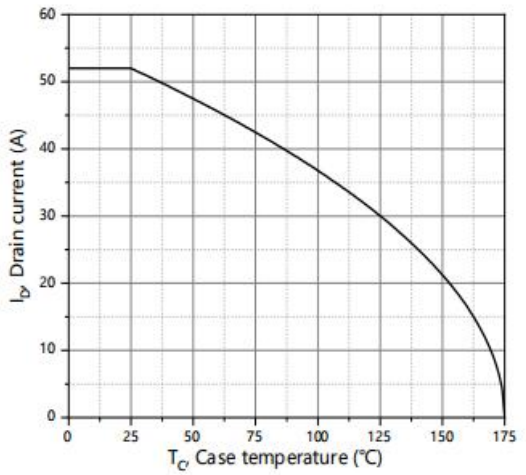


Figure 10. Drain current

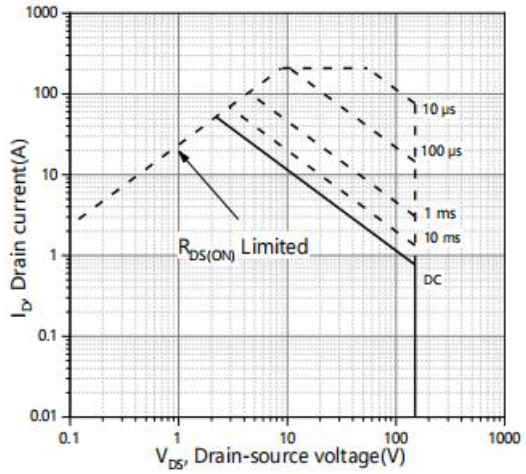


Figure 11. Safe operation area T_C=25°C

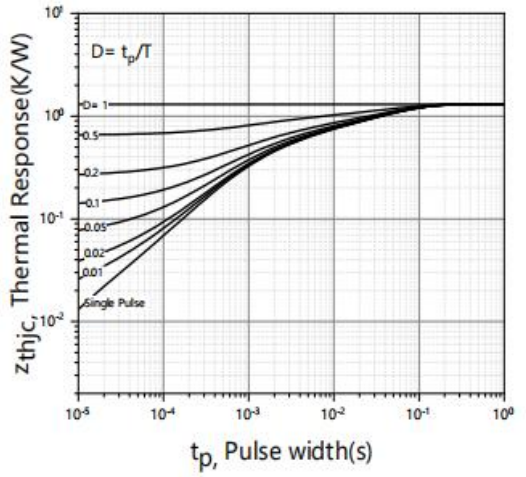


Figure 12. Max. transient thermal impedance

Test circuits and waveforms

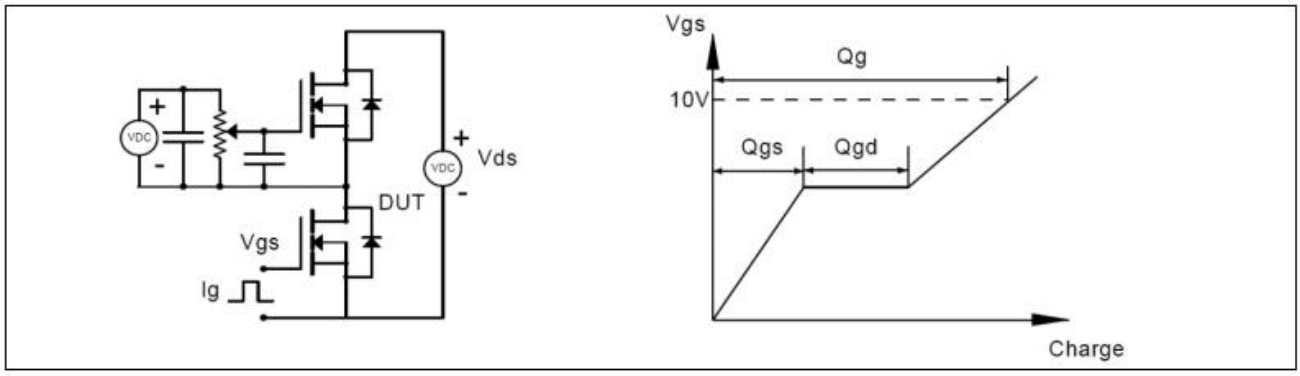


Figure 1. Gate charge test circuit & waveform

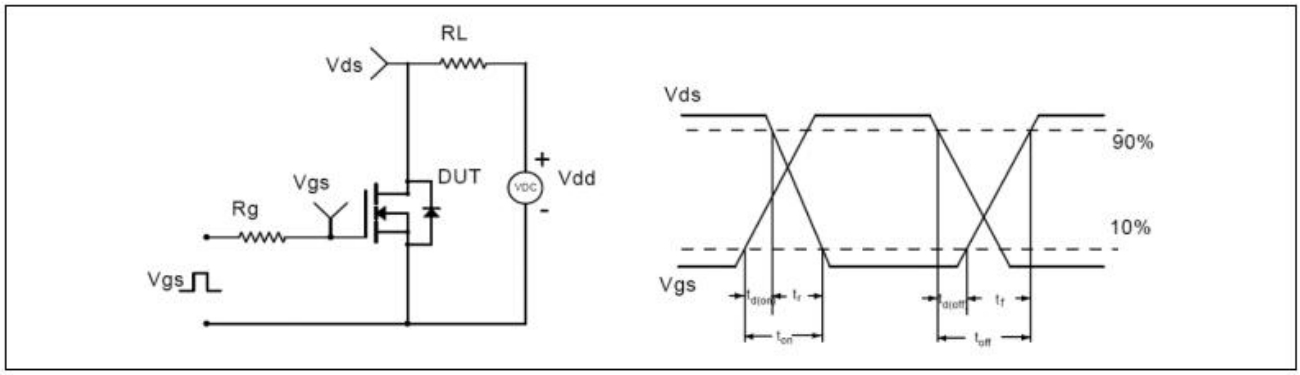


Figure 2. Switching time test circuit & waveforms

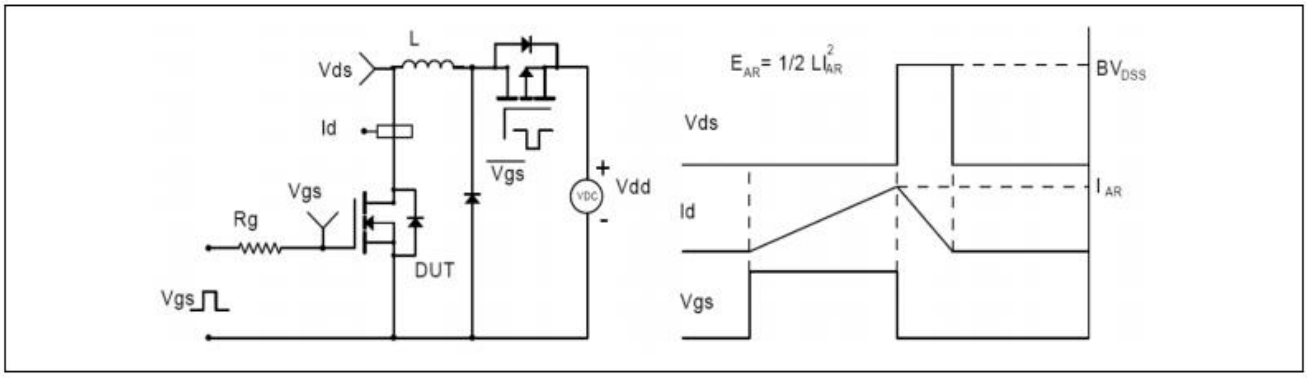


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

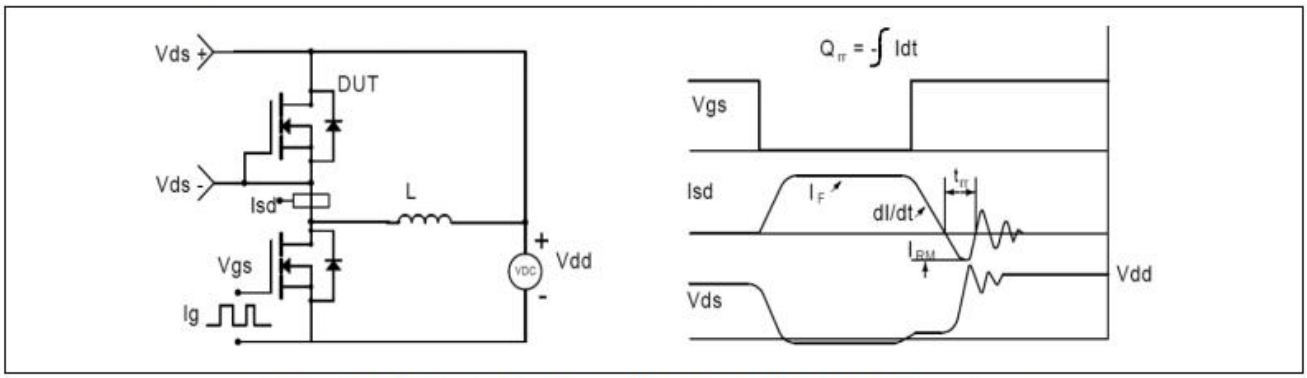
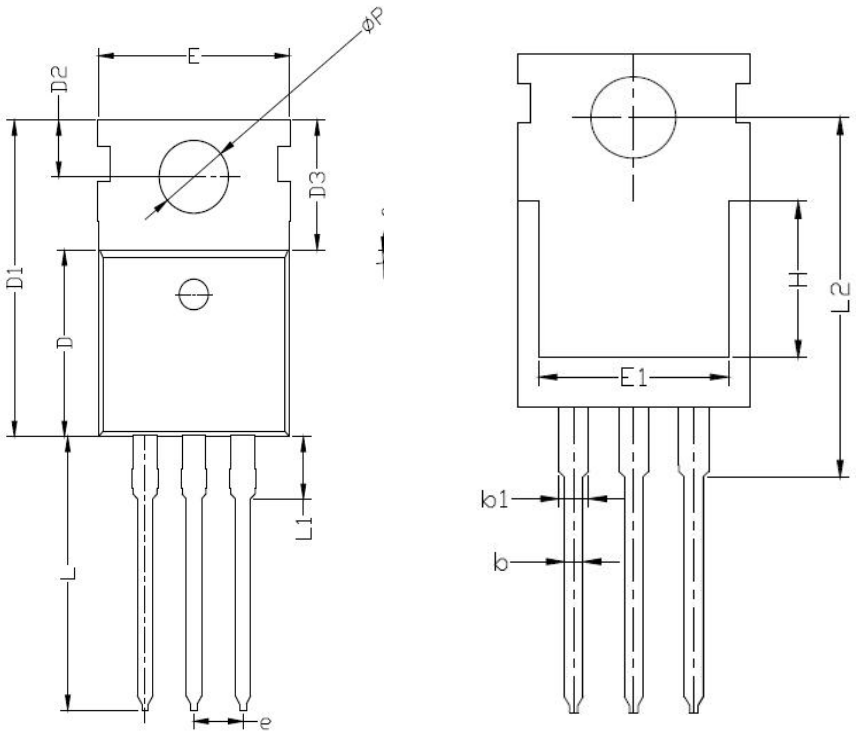


Figure 4. Diode reverse recovery test circuit & waveforms

Package Outline Dimensions



Symbols	Millimeters		
	MIN.	NOM.	MAX.
A	4.27	4.57	4.87
A1	1.15	1.30	1.45
A2	2.20	2.40	2.60
C	0.40	0.50	0.65
L1	2.80	3.10	3.40
L	13.20	13.50	13.70
L2	15.50	15.90	16.30
D	9.00	9.20	9.40
D1	15.10	15.60	16.10
D2	2.60	2.80	3.00
D3	6.20	6.40	6.60
e	2.54 BSC.		
H	6.70	6.90	7.10
E	9.70	9.90	10.10
E1	7.80	8.00	8.20
øP	3.40	3.60	3.80
b	0.70	0.80	0.90
b1	1.17	1.27	1.37
θ	4°	7°	10°
θ1	0°	3°	6°

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