

N-Channel 120V MOSFET

E120N2P0OH1

V_{DS} (V)	$R_{DS(on),max}$ (m Ω)	I_D (A)
120V	2.0 @ $V_{GS} = 10V$	280

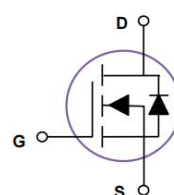
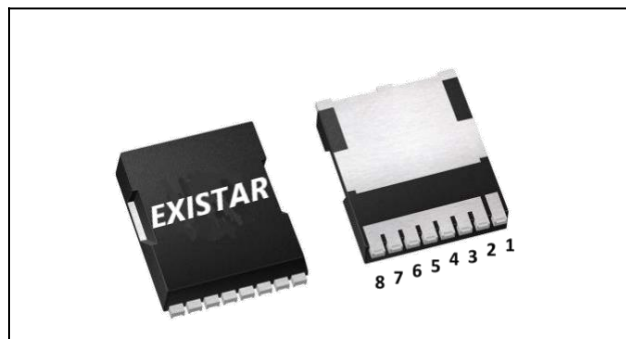
Features

- 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

TOLL-8



RoHS
COMPLIANT
HALOGEN
FREE

Package And Ordering Information

Ordering code	Package	Marking
E120N2P0OH1	TOLL-8	E120N2P0OH1

Ordering Information

Package	Units/ Reel	Reels/ Inner Box	Units/ Inner Box
TOLL-8	2000	1	2000

Key Performance Parameters

Parameter	Value	Unit
V _{DS} , min @ T _j (max)	120	V
I _D , pulse	1120	A
R _{DS(ON)} , max @ V _{GS} =10V	2.0	mΩ
Q _g	257	nC

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

Parameter		Symbol	Limit	Unit
Drain-source voltage		V _{DS}	120	V
Gate-source voltage		V _{GS}	±20	
Continuous drain current	T _C =25°C	I _D	280	A
	T _C =100°C		-	
Pulsed drain current		I _{D,pulse}	1120	
Avalanche energy, single pulse		E _{AS}	540	mJ
Power dissipation	T _C =25°C	P _D	325	W
	T _A =25°C		-	
Operating junction and storage temperature range		T _J , T _{stg}	-55 to 150	°C

Thermal Characteristics

Parameter		Symbol	Max.	Unit
Thermal resistance, junction-to-case	Steady state	R _{θJC}	0.38	°C/W
Thermal resistance, junction-to-ambient	Steady state	R _{θJA}	62	

Electrical Characteristics at T_j=25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Static						
Drain to source breakdown voltage	V _{(BR)DSS}	120			V	V _{GS} = 0, I _D = 250 μA
Gate-source threshold voltage	V _{GS(th)}	2	3	4	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} = 120 V, V _{GS} = 0 V
Drain-source on-resistance	R _{DS(on)}		1.87	2.0	mΩ	V _{GS} = 10 V, I _D = 50 A
Gate resistance	R _g		1.2		Ω	f=1MHz

Gate Charge						
Total gate charge	Qg		257		nC	V _{DS} = 50 V, I _D = 25 A, V _{GS} = 10 V
Gate-source charge	Qgs		81			
Gate-drain charge	Qgd		51			
Dynamic						
Turn-on delay time	t _{d(on)}		40		ns	V _{DS} = 50 V, I _D =25 A, V _{GS} = 10 V, R _{GEN} = 2 Ω
Rise time	t _r		36			
Turn-off delay time	t _{d(off)}		104			
Fall time	t _f		40			
Input capacitance	C _{iss}		18680		pF	V _{DS} =25 V, V _{GS} = 0 V, f = 100kHz
Output capacitance	C _{oss}		4340			
Reverse transfer capacitance	C _{rss}		538			
Body Diode						
Diode forward voltage	V _{SD}		-	1.3	V	V _{GS} = 0 V, I _S = 30 A
Reverse recovery time	t _{rr}		110		ns	V _R = 50 V, I _S =25 A, di/dt = 100 A/μs
Reverse recovery charge	Q _{rr}		324		nC	
Peak reverse recovery current	I _{rrm}		4.9		A	

Electrical Characteristics Diagrams

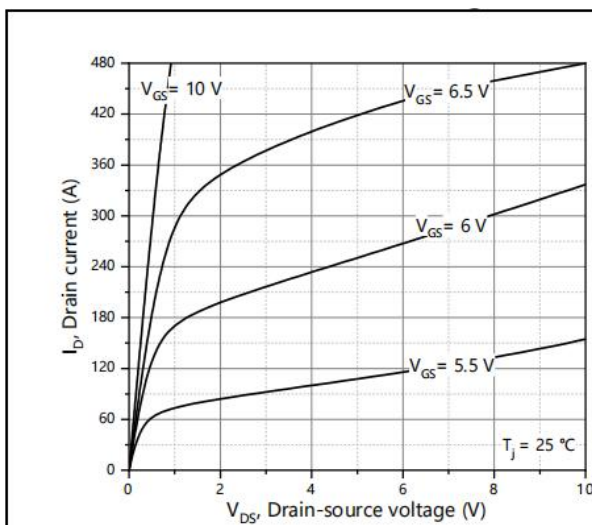


Figure 1. Typ. output characteristics

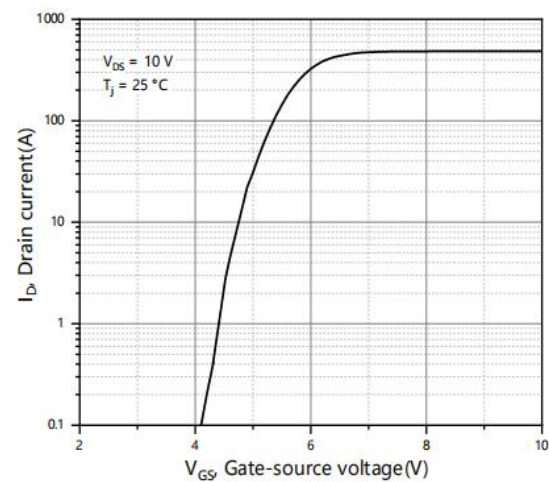


Figure 2. Typ. transfer characteristics

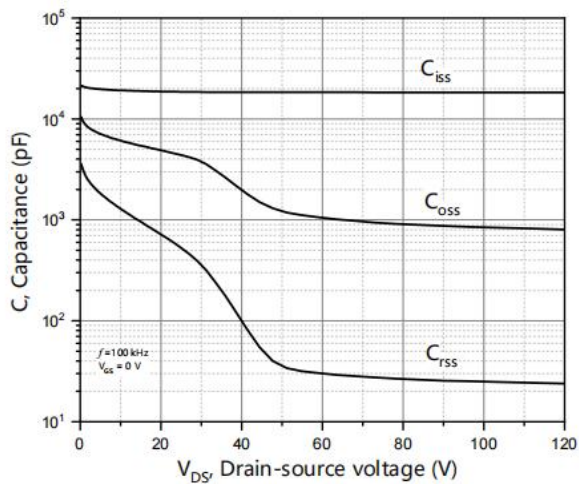


Figure 3. Typ. capacitances

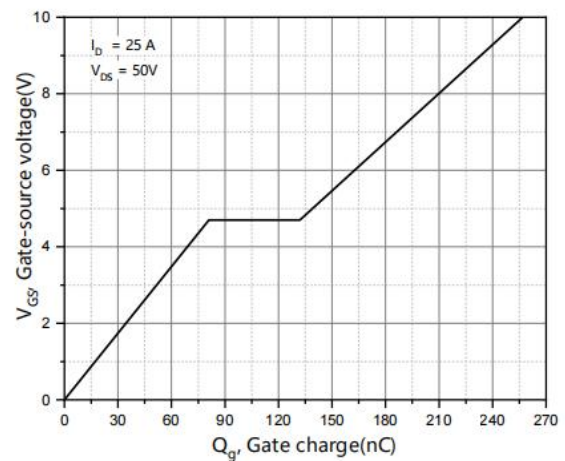


Figure 4. Typ. gate charge

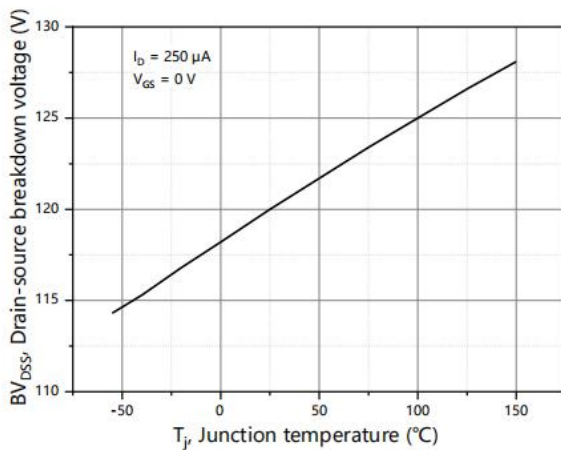


Figure 5. Drain-source breakdown voltage

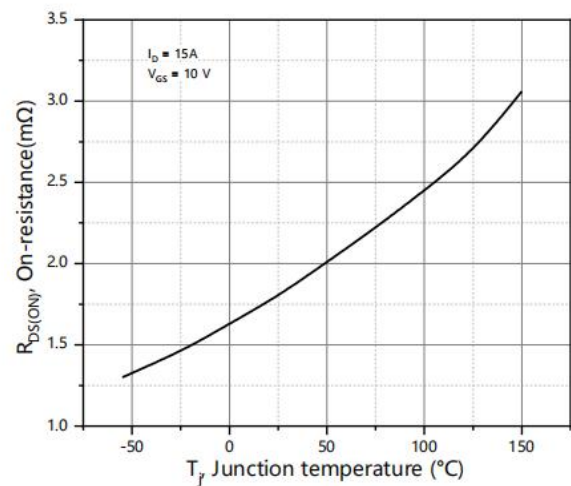


Figure 6. Drain-source on-state resistance

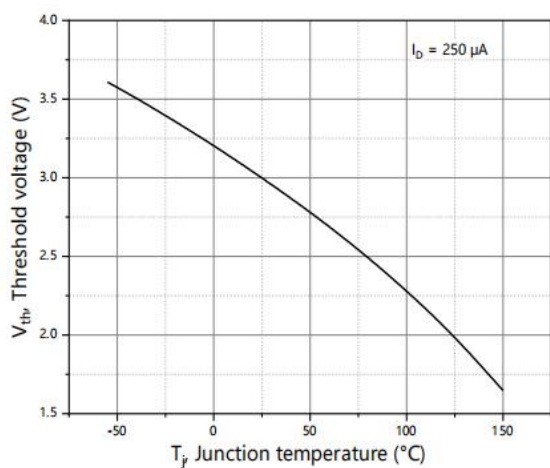


Figure 7. Threshold voltage

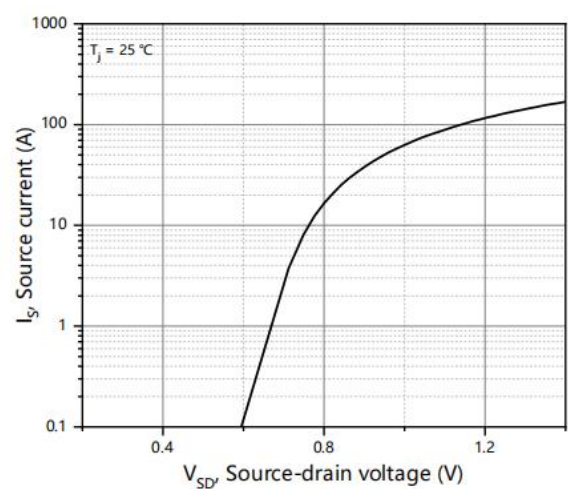


Figure 8. Forward characteristic of body diode

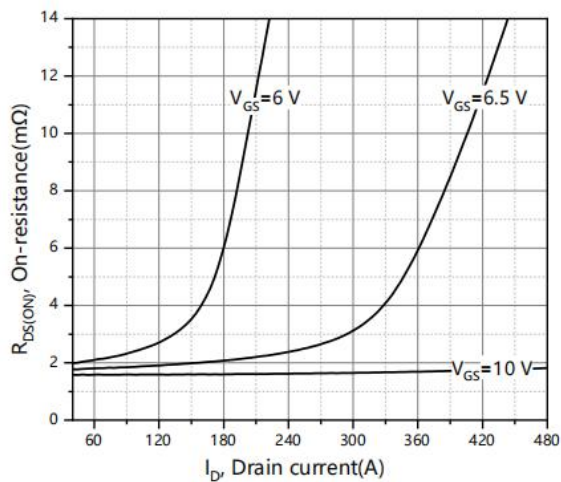


Figure 9. Drain-source on-state resistance

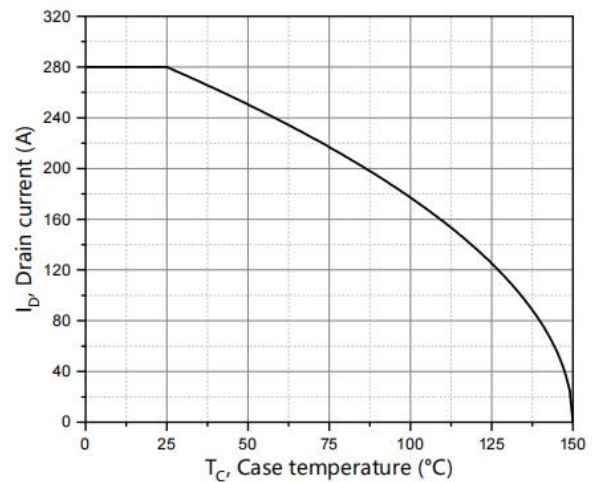


Figure 10. Drain current

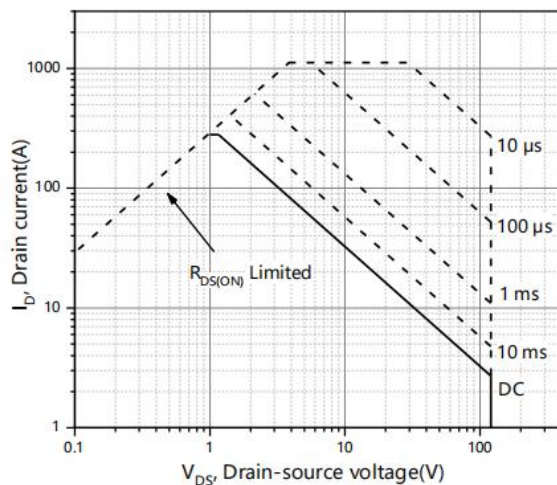


Figure 11. Safe operation area $T_C=25^\circ\text{C}$

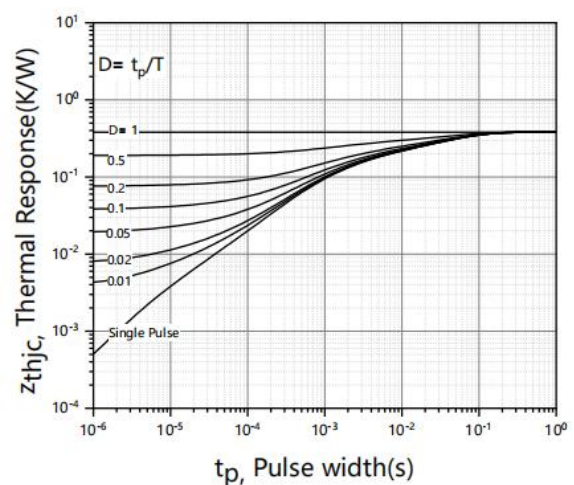


Figure 12. Max. transient thermal impedance

Test circuits and waveforms

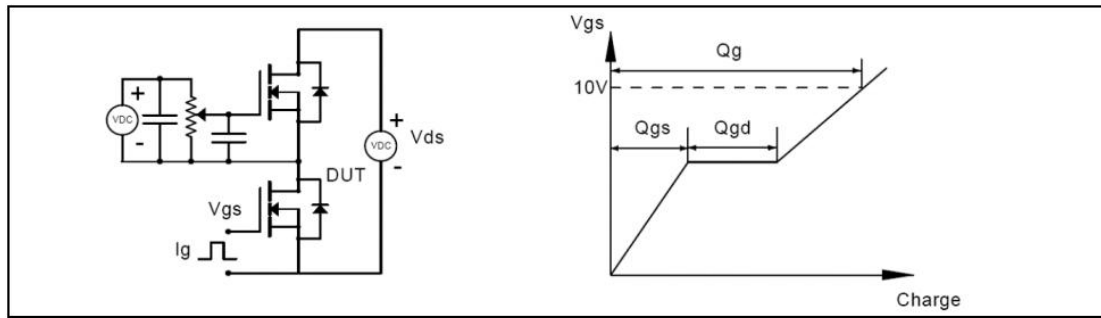


Figure 1. Gate charge test circuit & waveform

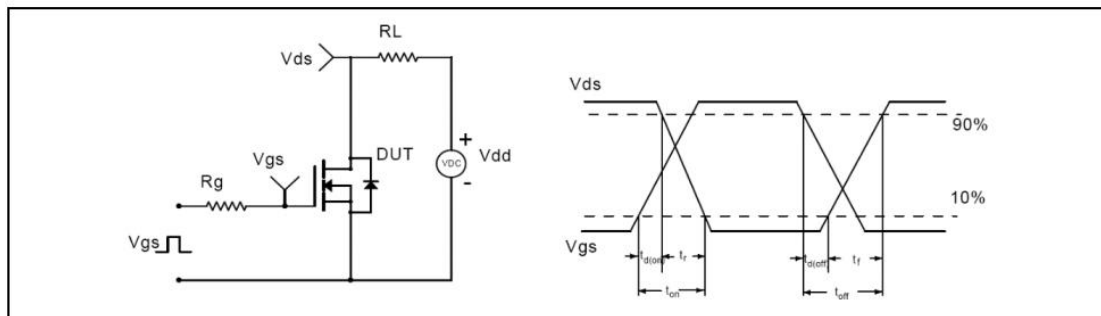


Figure 2. Switching time test circuit & waveforms

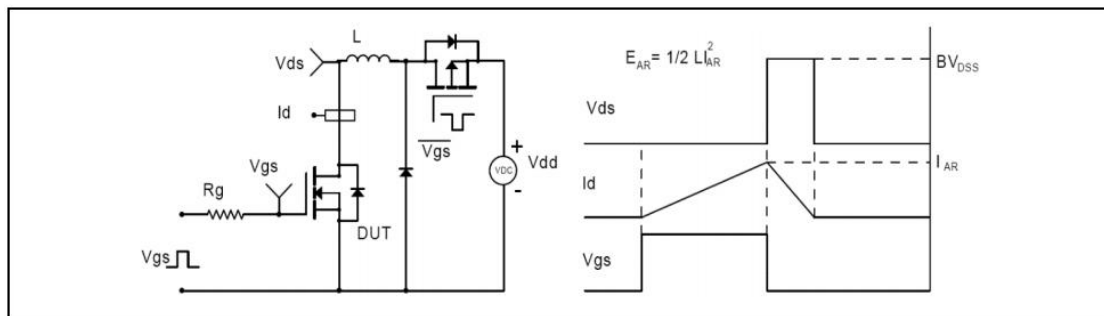


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

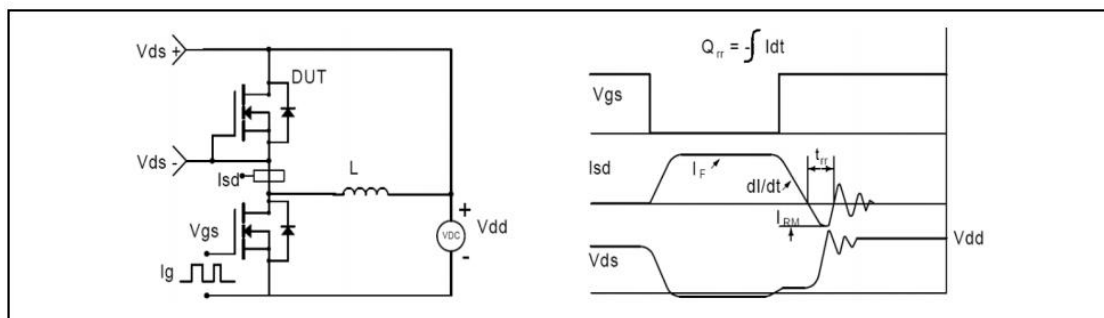
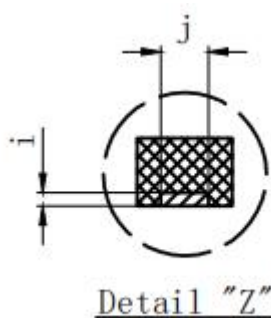
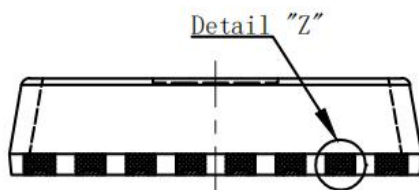
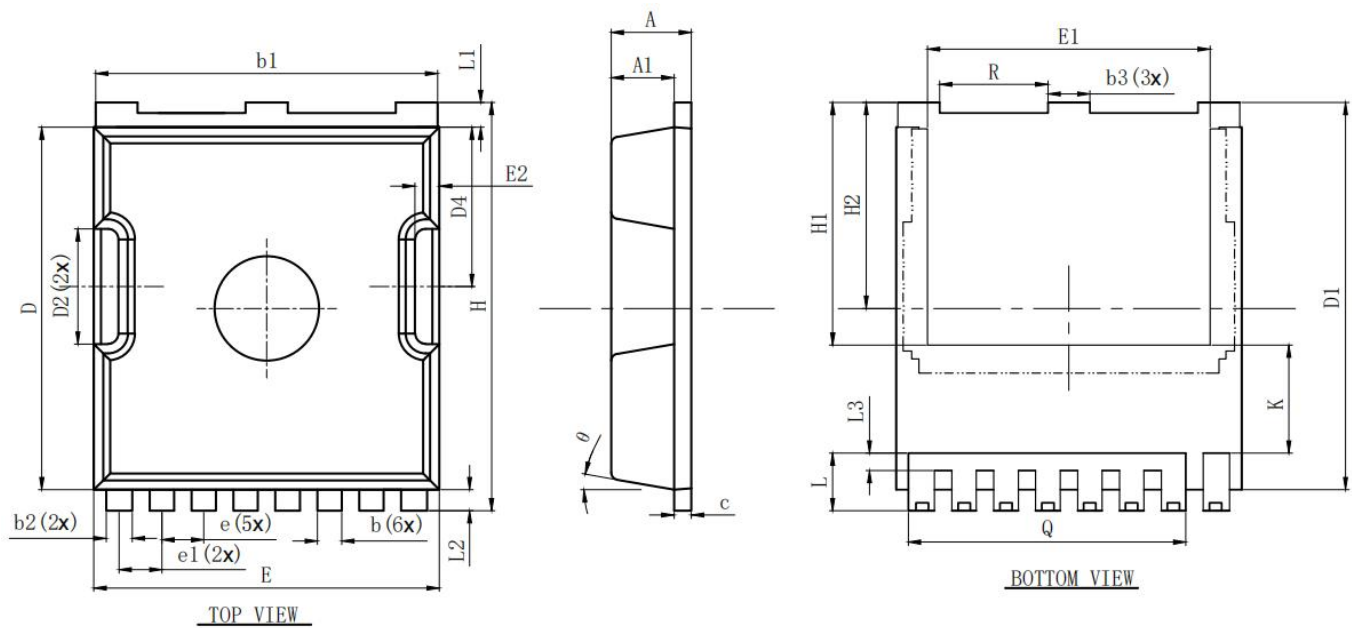


Figure 4. Diode reverse recovery test circuit & waveforms

Package Outline Dimensions



SYMBOL	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.200	2.300	2.400
A1	1.700	1.800	1.900
b	0.600	0.700	0.800
b1	9.700	9.800	9.900
b2	0.650	0.750	0.850
b3	1.100	1.200	1.300
c	0.400	0.500	0.600
D	10.300	10.400	10.500
D1	11.000	11.100	11.200
D2	3.200	3.300	3.400
D4	4.470	4.570	4.670
E	9.800	9.900	10.000
E1	8.000	8.100	8.200
E2	0.500	0.600	0.700
e	1.200 BSC		
e1	1.225 BSC		
H	11.600	11.700	11.800
H1	6.950 BSC		
H2	5.900 BSC		
i	0.100 REF.		
j	0.350 REF.		
K	3.100 REF.		
L	1.550	1.650	1.750
L1	0.600	0.700	0.800
L2	0.500	0.600	0.700
L3	0.400	0.500	0.600
Q	7.950 REF.		
R	3.000	3.100	3.200
θ	10° REF.		

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