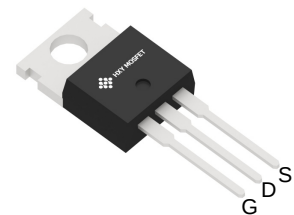




Description

The HXY50N20P uses 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.



TO-220

General Features

$V_{DS} = 200V, I_D = 50A$

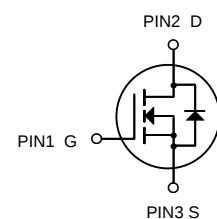
$R_{DS(ON)} < 60m\Omega @ V_{GS} = 10V$

Application

High efficiency switch mode power supplies

Power factor correction

Electronic lamp ballast



N-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Marking	Units Tube
HXY50N20P	TO-220	50N20 XXXX	50

Absolute Maximum Ratings@ $T_J = 25^\circ C$ (unless otherwise specified)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	50	A
Drain Current-Continuous($T_C = 100^\circ C$)	$I_D(100^\circ C)$	28	A
Pulsed Drain Current	I_{DM}	70	A
Maximum Power Dissipation	P_D	125	W
Derating factor	-	1.06	W/ $^\circ C$
Single pulse avalanche energy	E_{AS}	1200	mJ
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.0	$^\circ C/W$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ C$



Electrical Characteristics

T_J = 25°C unless otherwise noted

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =250μA	200			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =200V, V _{GS} =0V			1	μA
Gate- Source Leakage Current	Forward	I _{GSS}	V _G =20V, V _{DS} =0V			100	nA
	Reverse		V _{GS} =-20V, V _{DS} =0V			-100	nA
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =20A		50	60	mΩ
Input Capacitance		C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0 MHz		2799	3699	pF
Output Capacitance		C _{OSS}			304	399	pF
Reverse Transfer Capacitance		C _{RSS}			109	149	pF
Turn-On Delay Time		t _{D(ON)}	V _{DD} =100V, I _D =20A, R _G =3.9Ω (Note 1, 2)		19		ns
Turn-On Rise Time		t _R			29		ns
Turn-Off Delay Time		t _{D(OFF)}			64		ns
Turn-Off Fall Time		t _F			24		ns
Total Gate Charge		Q _G	V _{DS} =100V, I _D =20A, V _{GS} =10V (Note 1, 2)		96	120	nC
Gate-Source Charge		Q _{GS}			13		nC
Gate-Drain Charge		Q _{GD}			38		nC
Drain-Source Diode Forward Voltage		V _{SD}	V _{GS} = 0 V, I _S =29A			1.5	V
Maximum Continuous Drain-Source Diode Forward Current		I _S				52	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}				70	A
Reverse Recovery Time		t _{rr}	V _{GS} =0V, I _S =20A, dI _F /dt =100 A/μs (Note 1)		280		ns
Reverse Recovery Charge		Q _{RR}			420		μC

Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.



Electrical Characteristics Diagrams

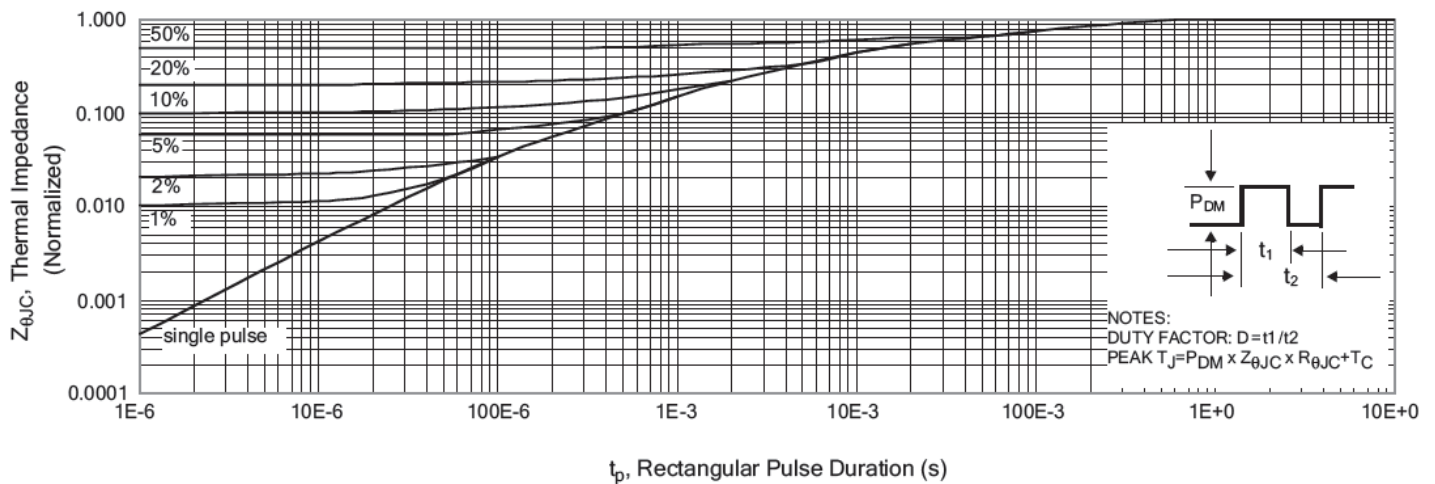


Figure 1. Maximum Effective Thermal Impedance, Junction-to-Case

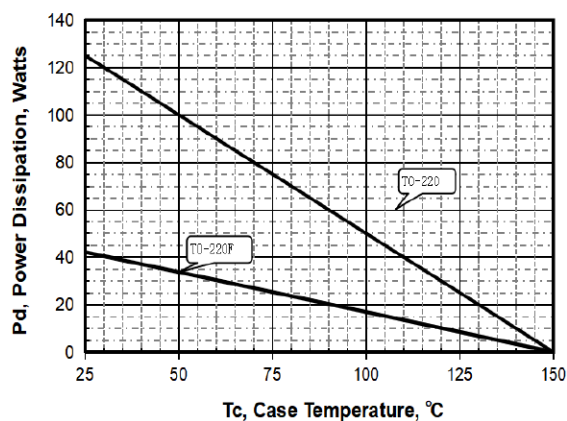


Figure 2. Max. Power Dissipation vs Case Temperature

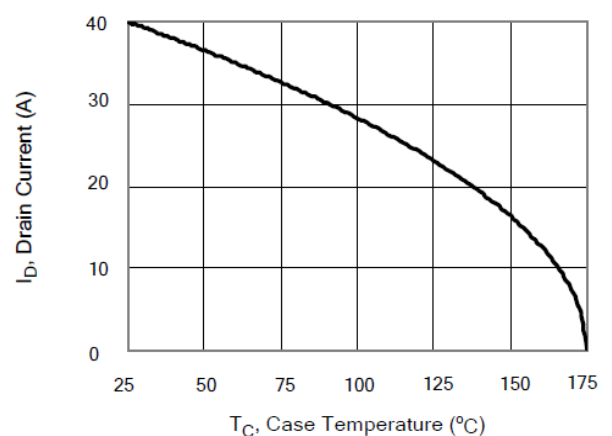


Figure 3. Maximum Continuous Drain Current vs Case Temperature

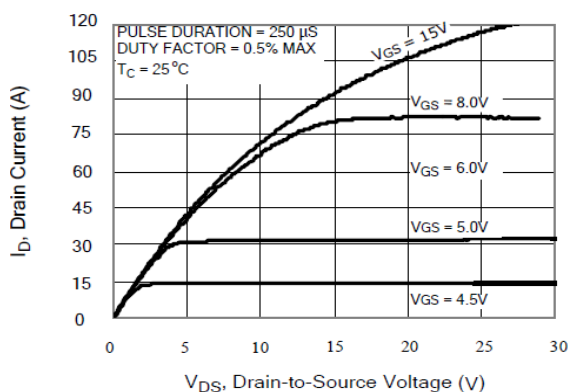


Figure 4. Typical Output Characteristics

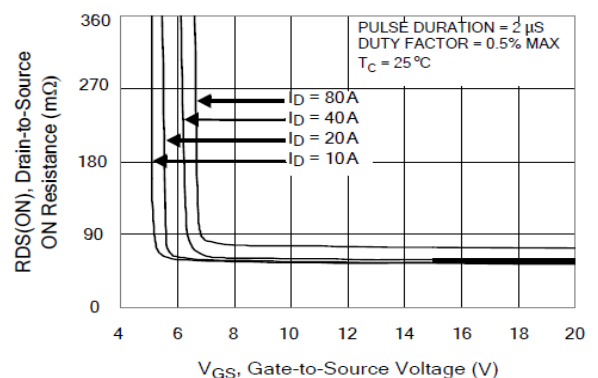


Figure 5. Typical Drain-to-Source ON Resistance vs Gate Voltage and Drain Current

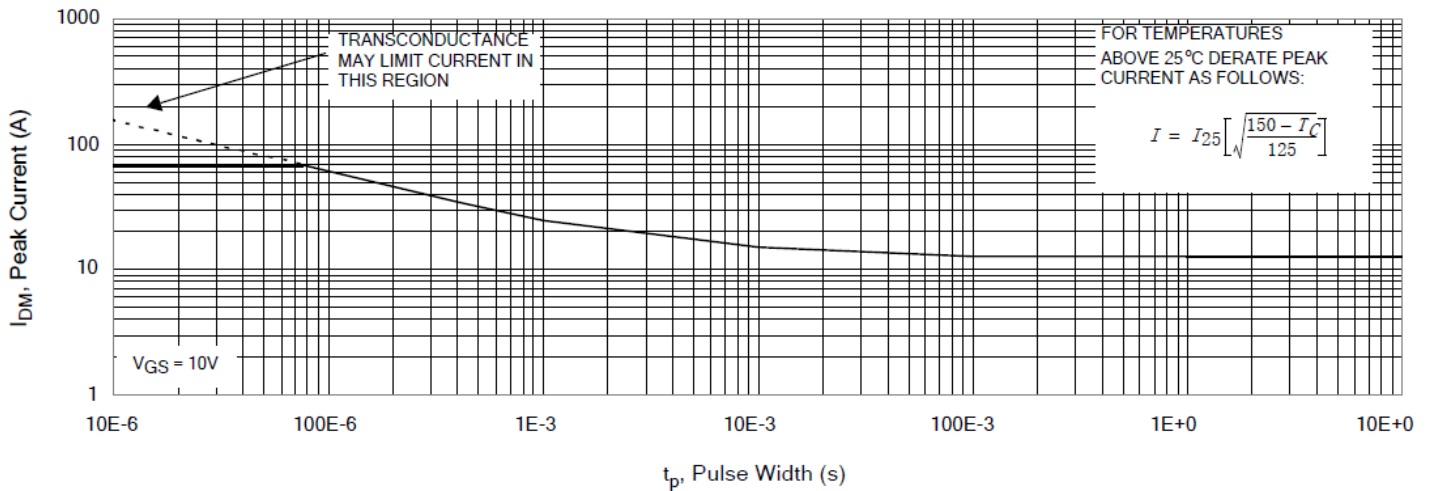


Figure 6. Maximum Peak Current Capability

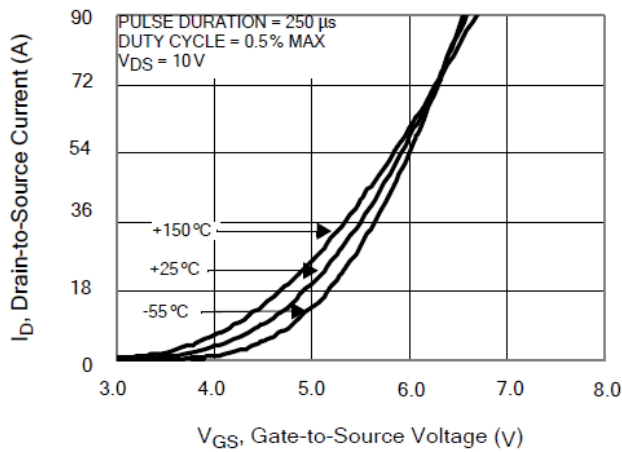


Figure 7. Typical Transfer Characteristics

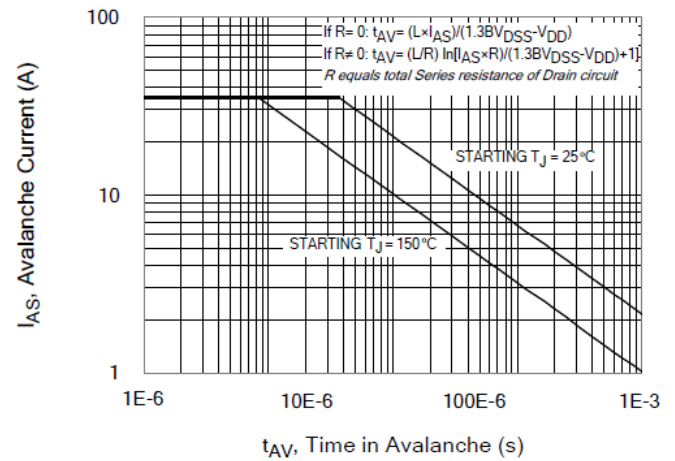


Figure 8. Unclamped Inductive Switching Capability

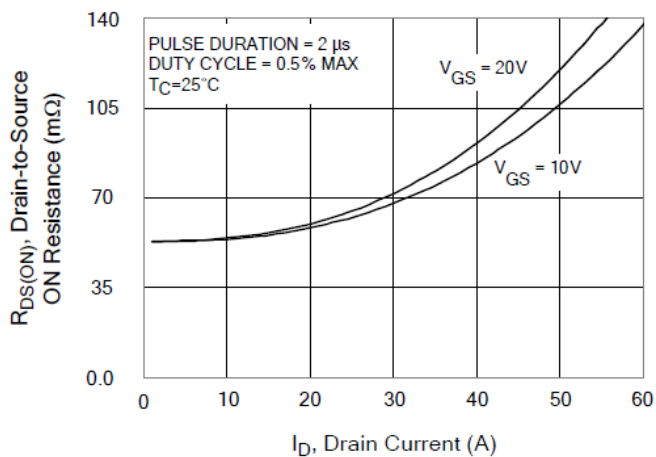


Figure 9. Typical Drain-to-Source ON Resistance vs Drain Current

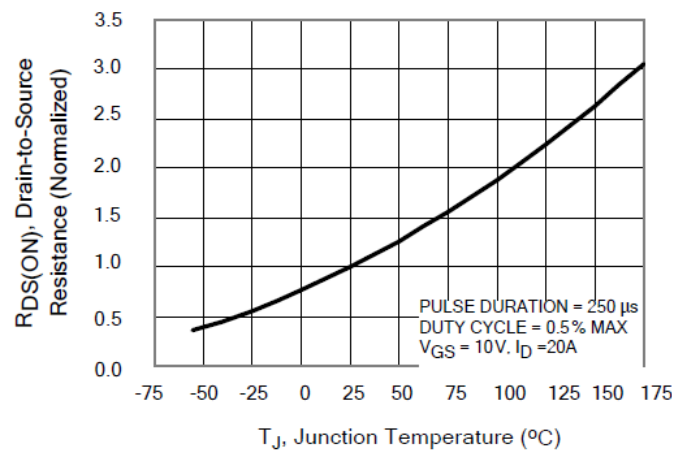


Figure 10. Typical Drain-to-Source Resistance vs Junction Temperature

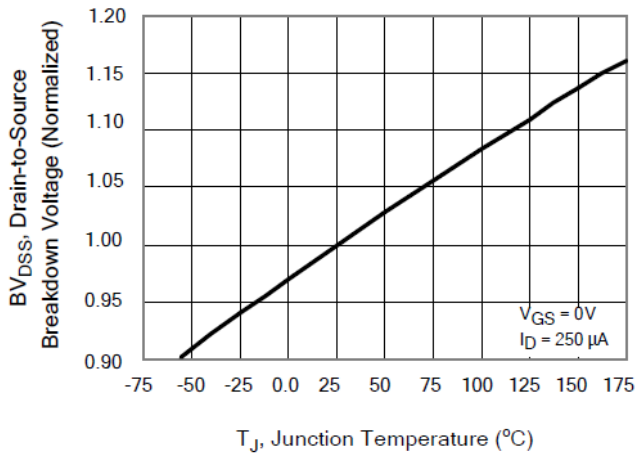


Figure 11. Typical Breakdown Voltage vsJunction Temperature

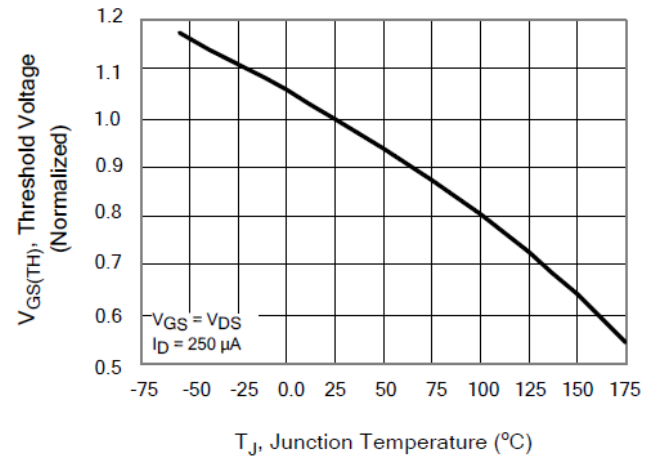


Figure 12. Typical Threshold Voltage vsJunction Temperature

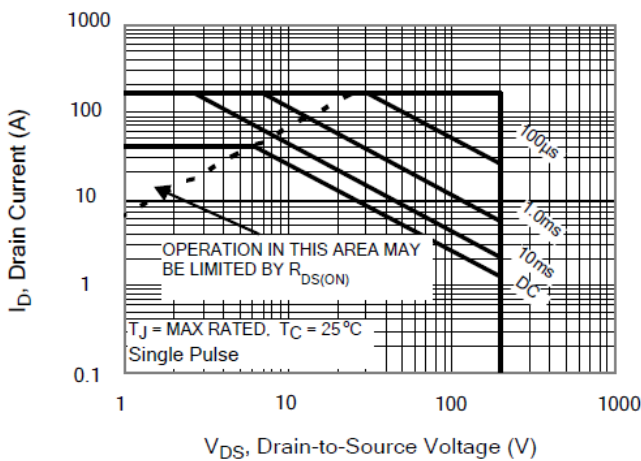


Figure 13.Maximum Forward Bias SafeOperating Area

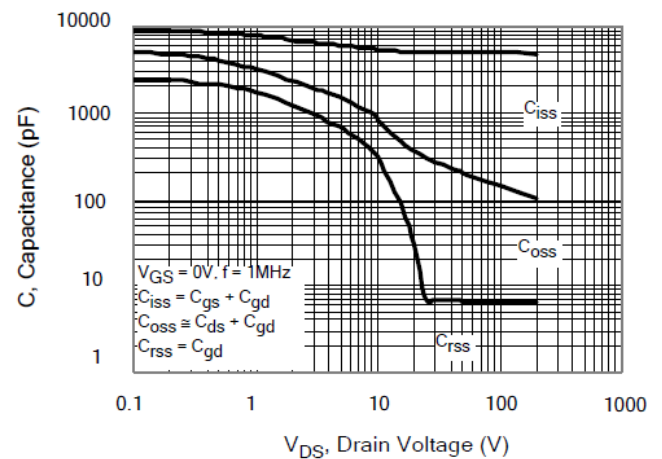


Figure 14. Typical Capacitance vsDrain-to-Source Voltage

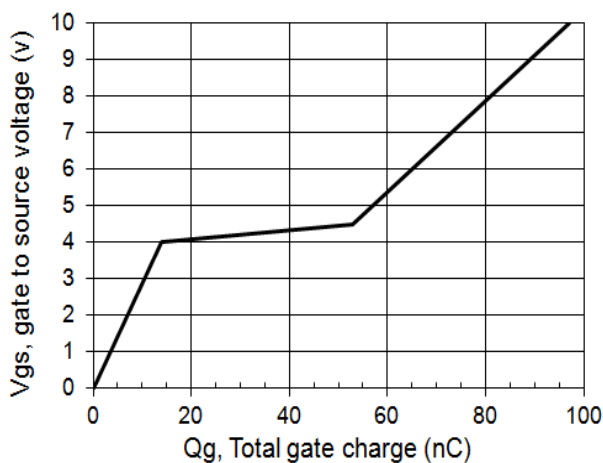


Figure 15. Typical Gate Charge

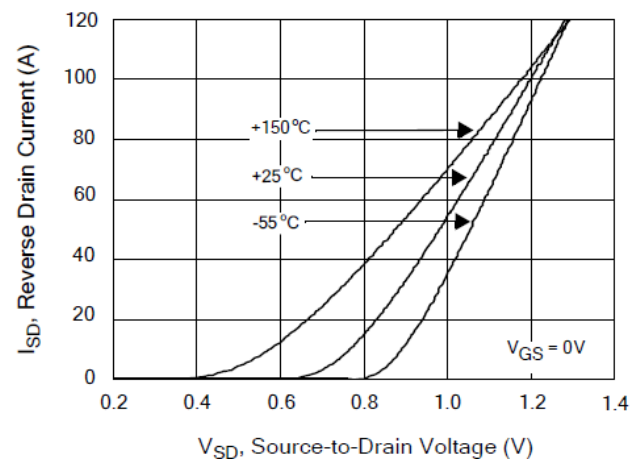
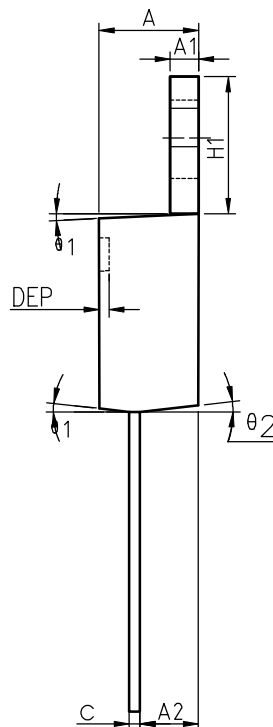
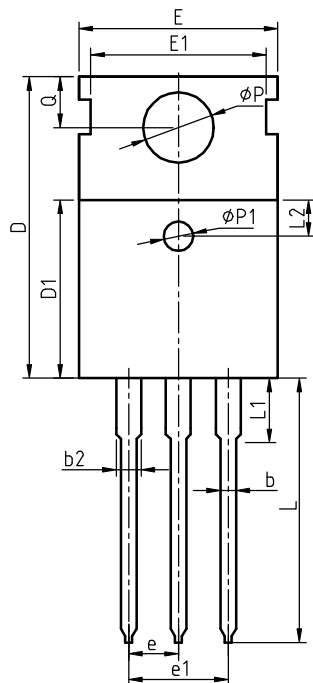


Figure 16. Typical Body Diode TransferCharacteristics



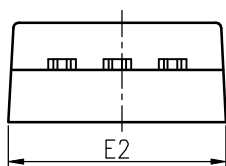
Package Information

TO-220



COMMON DIMENSIONS

SYMBOL	MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185
A1	1.27	1.30	1.33	0.050	0.051	0.052
A2	2.35	2.40	2.50	0.093	0.094	0.098
b	0.77	0.80	0.90	0.030	0.031	0.035
b2	1.17	1.27	1.36	0.046	0.050	0.054
c	0.48	0.50	0.56	0.019	0.020	0.022
D	15.40	15.60	15.80	0.606	0.614	0.622
D1	9.00	9.10	9.20	0.354	0.358	0.362
DEP	0.05	0.10	0.20	0.002	0.004	0.008
E	9.80	10.00	10.20	0.386	0.394	0.402
E1	-	8.70	-	-	0.343	-
E2	9.80	10.00	10.20	0.386	0.394	0.402
e		2.54	BSC		0.100	BSC
e1		5.08	BSC		0.200	BSC
H1	6.40	6.50	6.60	0.252	0.256	0.260
L	12.75	13.50	13.65	0.502	0.531	0.537
L1	-	3.10	3.30	-	0.122	0.130
L2		2.50	REF		0.098	REF
P	3.50	3.60	3.63	0.138	0.142	0.143
P1	3.50	3.60	3.63	0.138	0.142	0.143
Q	2.73	2.80	2.87	0.107	0.110	0.113
θ 1	5°	7°	9°	5°	7°	9°
θ 2	1°	3°	5°	1°	3°	5°
θ 3	1°	3°	5°	1°	3°	5°





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