IXYS

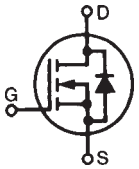
Advance Technical Information

Polar™ Power MOSFET

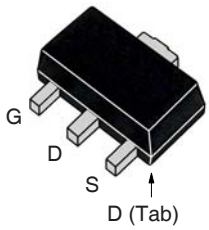
IXTS01N90P-89
IXTS01N90P-223

V_{DSS} = 900V
I_{D25} = 100mA
$R_{DS(on)}$ ≤ 75Ω

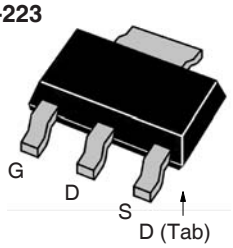
N-Channel Enhancement Mode



SOT-89



SOT-223



G = Gate D = Drain
S = Source Tab = Drain

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	900	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	900	V
V_{GSS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	100	mA
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	450	mA
dv/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$	10	V/ns
P_D	T_C = 25°C	25	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	°C
Weight	SOT-89	0.35	g
	SOT-223	0.40	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 250μA	900			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 100μA	1.5		3.0	V
I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±25	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0V			25	nA
	T_J = 125°C			2	μA
$R_{DS(on)}$	V_{GS} = 5V, $I_D = 0.5 \bullet I_{D25}$, Note 1		64	77	Ω
	V_{GS} = 10V, $I_D = 0.5 \bullet I_{D25}$, Note 1		62	75	Ω

Features

- High Voltage, Low Leakage Mosfet in SMD Package
- Suitable for V_{GE} = 5V Drive

Applications

- DC-DC Converters
- Switch-Mode and Resonant-Mode Power Supplies
- Protection Circuits

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max	
g_{fs}	V_{DS} = 50V, I_D = 0.5 • I_{D25}, Note 1	70	120		mS
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		82.0		pF
C_{oss}			5.7		pF
C_{rss}			1.4		pF
$t_{d(on)}$	**Resistive Switching Times**		5		ns
t_r	V_{GS} = 10V, V_{DS} = 50V, I_D = 0.5 • I_{D25}		20		ns
$t_{d(off)}$	R_G = 50Ω (External)		30		ns
t_f			65		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		2.2		nC
Q_{gs}			0.4		nC
Q_{gd}			0.7		nC
R_{thJC}				5.0	°C/W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max	
I_S	V_{GS} = 0V			100	mA
I_{SM}	Repetitive, pulse Width Limited by T_{JM}			400	mA
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			1.4	V
t_{rr}	I_F = 1A, -di/dt = 100A/μs		285		ns
Q_{RM}	V_R = 100V		860		nC
I_{RM}			6		A

Note 1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 2%.

ADVANCE TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

Fig. 1. Output Characteristics @ T_J = 25°C

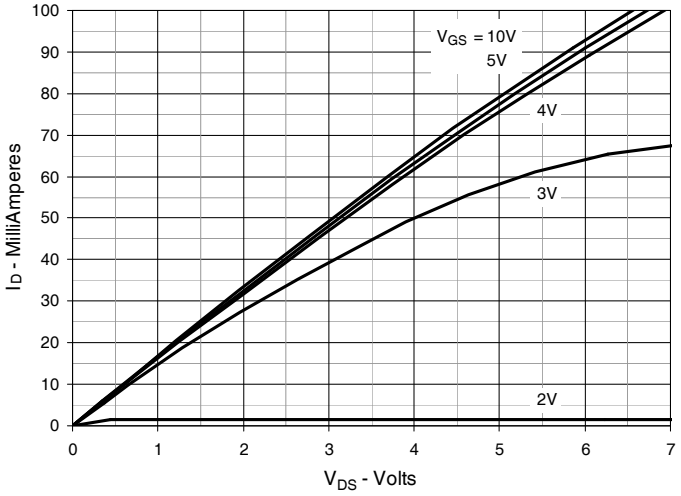


Fig. 2. Extended Output Characteristics @ T_J = 25°C

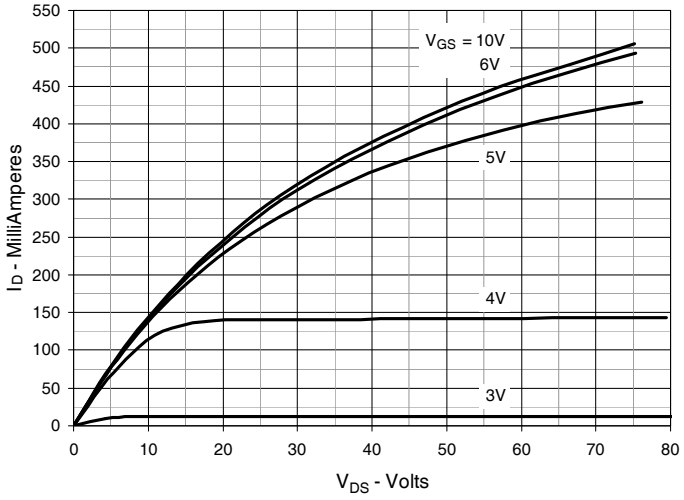


Fig. 3. Output Characteristics @ T_J = 125°C

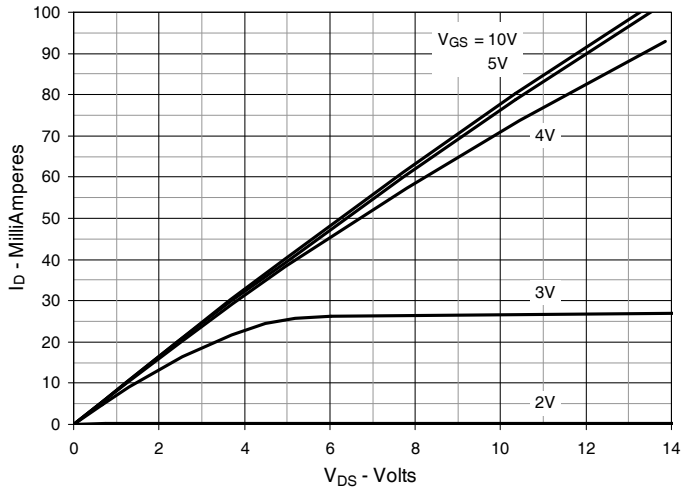


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 50mA Value vs. Junction Temperature

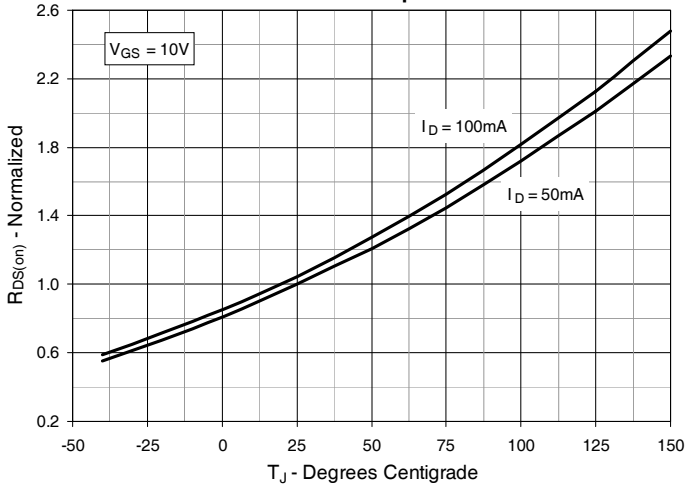


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 50mA Value vs. Drain Current

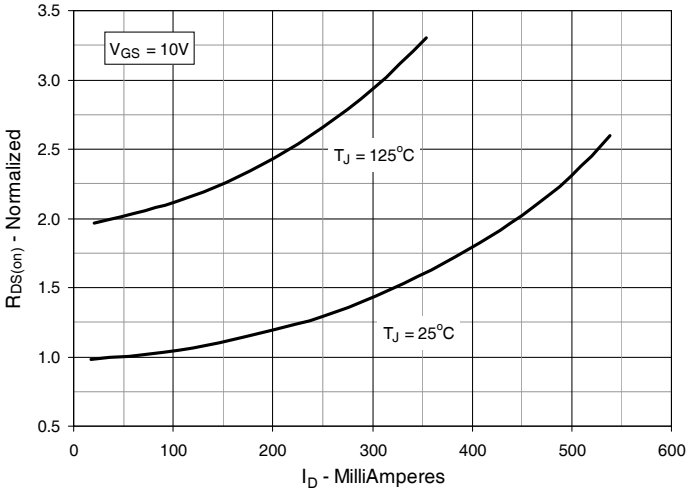


Fig. 6. Normalized Breakdown & Threshold Voltages vs. Junction Temperature

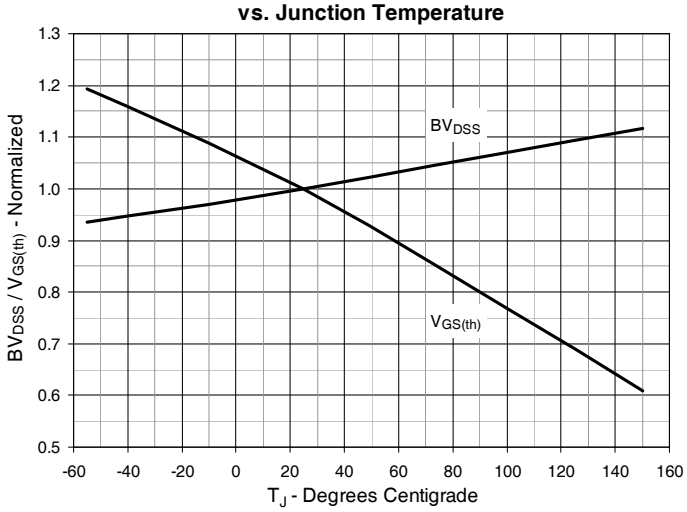


Fig. 7. Maximum Drain Current vs. Case Temperature

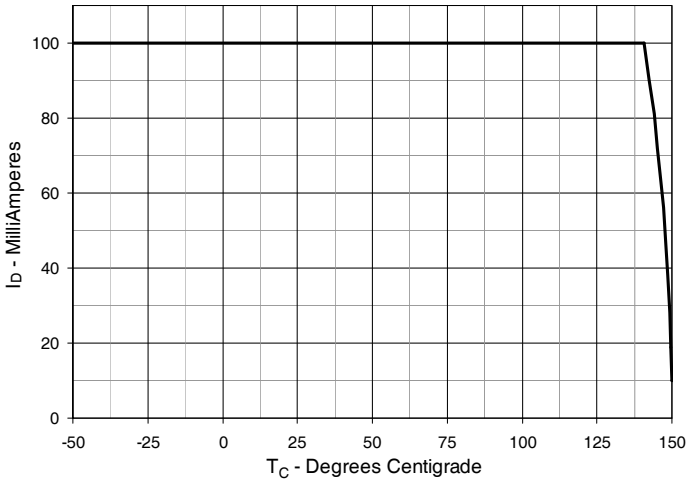


Fig. 8. Input Admittance

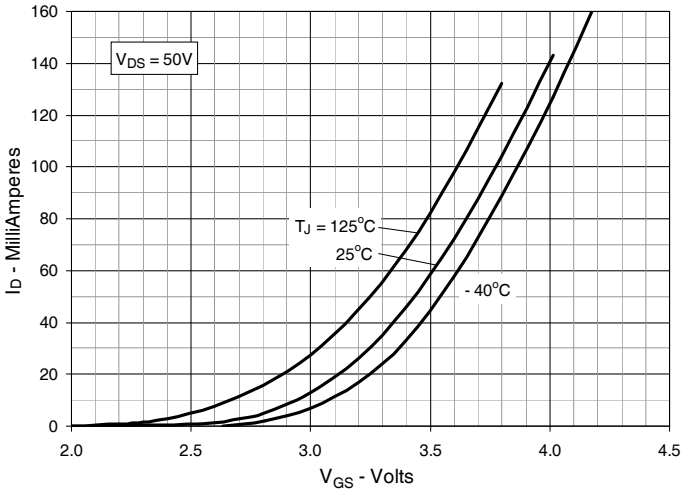


Fig. 9. Transconductance

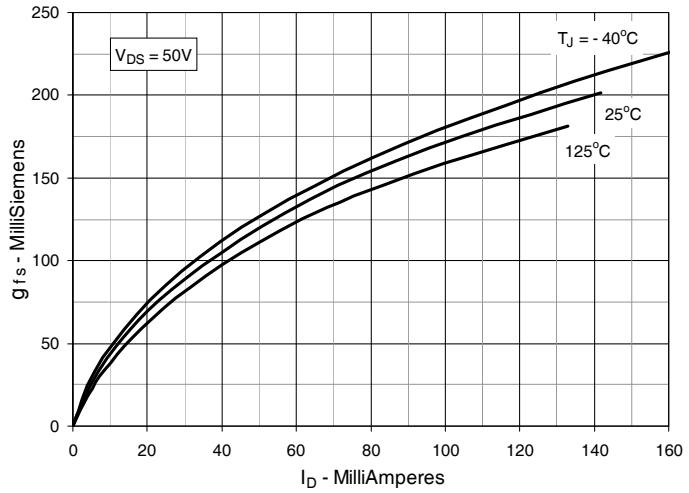


Fig. 10. Forward Voltage Drop of Intrinsic Diode

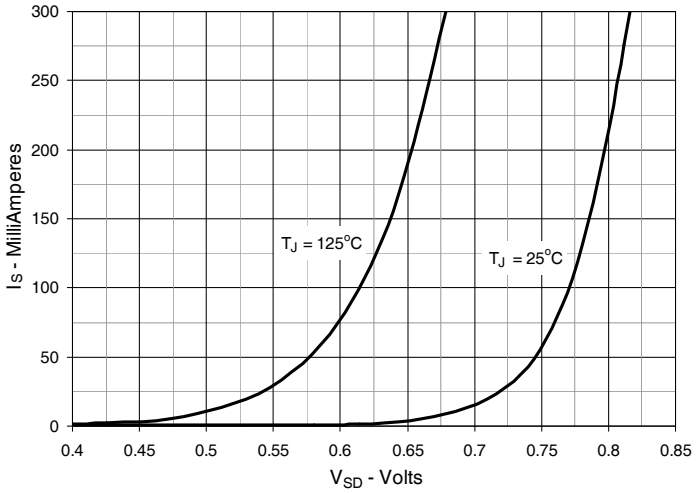


Fig. 11. Gate Charge

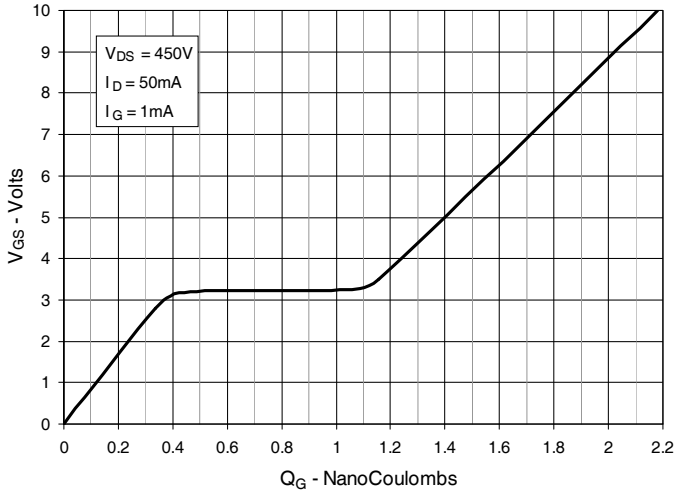


Fig. 12. Capacitance

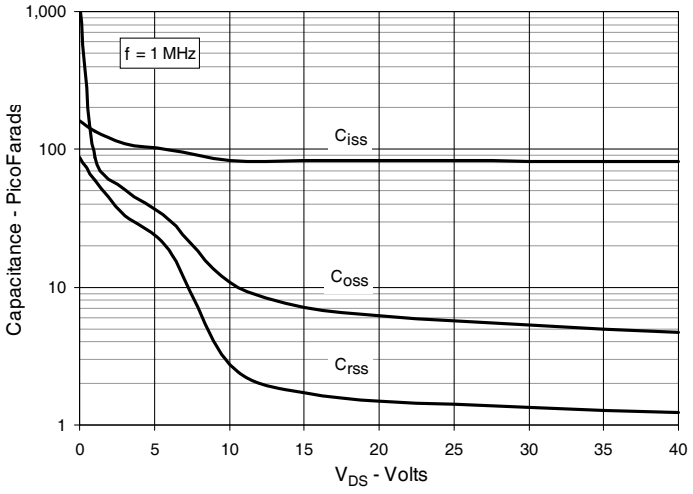


Fig. 13. Forward-Bias Safe Operating Area

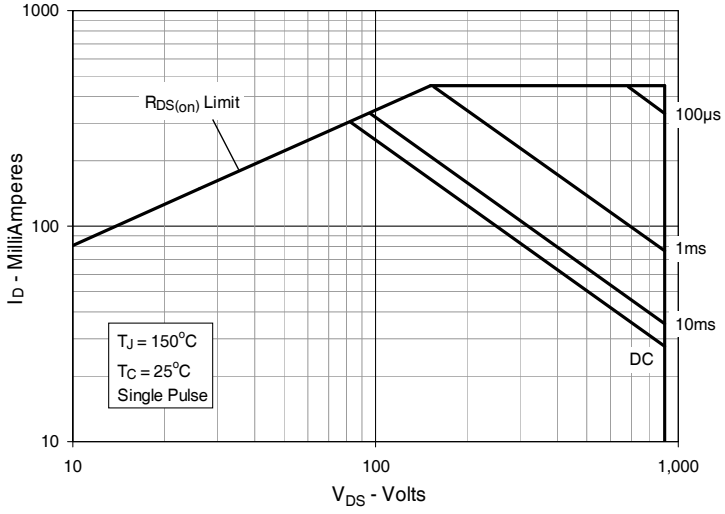
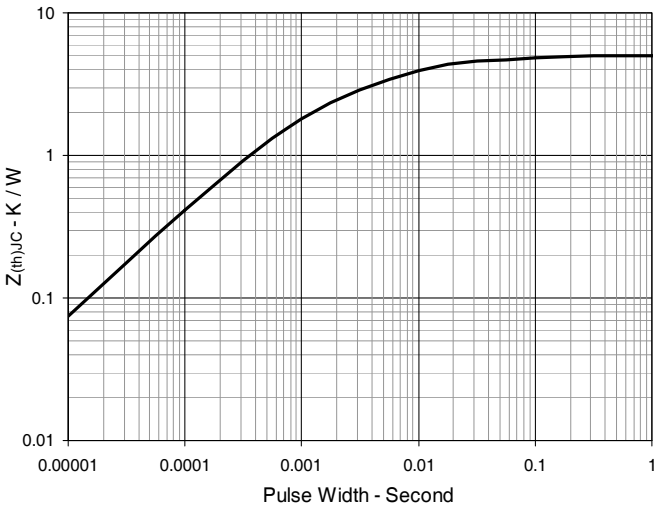
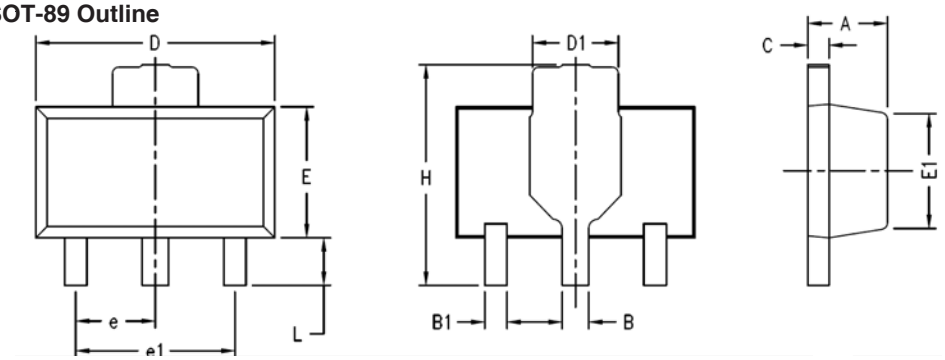
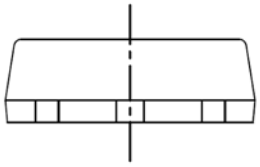


Fig. 14. Maximum Transient Thermal Impedance



SOT-89 Outline

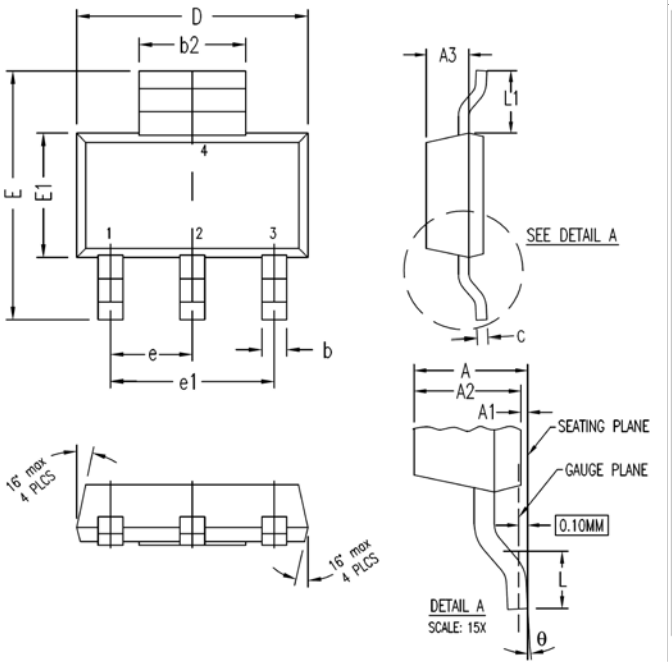




NOTE:
1. All leads are matte pure tin plated.

SYM	INCHES		MILLI METER	
	MIN	MAX	MIN	MAX
A	0.055	0.063	1.40	1.60
B	0.017	0.022	0.43	0.56
B1	0.014	0.019	0.36	0.48
C	0.014	0.017	0.36	0.43
D	0.173	0.181	4.39	4.60
D1	0.066	0.070	1.67	1.78
E	0.090	0.099	2.29	2.51
E1	0.084	0.086	2.13	2.18
e	0.059		1.50	
e1	0.118		3.00	
H	0.155	0.167	3.93	4.24
L	0.029	0.041	0.74	1.04

SOT-223 Outline



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.063	0.071	1.60	1.80
A1	0.001	0.005	0.02	0.13
A2	0.059	0.067	1.50	1.70
A3	0.043	0.051	1.10	1.30
b	0.026	0.033	0.66	0.84
b2	0.116	0.124	2.95	3.15
c	0.009	0.015	0.24	0.38
D	0.248	0.264	6.30	6.70
E	0.264	0.287	6.70	7.30
E1	0.130	0.146	3.30	3.70
e	0.087	0.094	2.20	2.40
e1	0.177	0.185	4.50	4.70
L	0.024	0.036	0.62	0.92
L1	0.065	0.073	1.65	1.85
θ	0°	10°	0°	10°