

N-Channel Enhancement Mode Power MOSFET

● Features

$$V_{DS} = 30V,$$

$$I_D = 12A$$

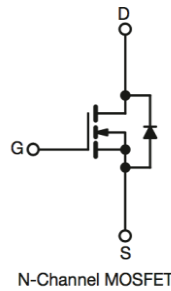
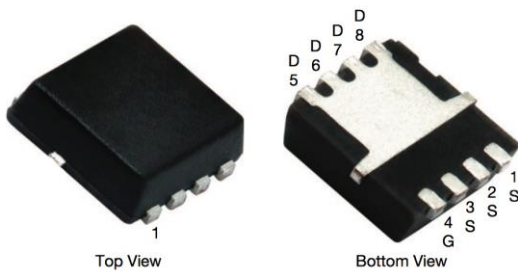
$$R_{DS(ON)} @ V_{GS} = 10V, \text{ TYP } 8.5m\Omega$$

$$R_{DS(ON)} @ V_{GS} = 4.5V, \text{ TYP } 13m\Omega$$

● General Description

- DC/DC Converters in Computing , servers, POL
- Isolated DC/DC Converters in Telecom and Industrial

● Pin Configurations



PDFN3*3-8L

● Absolute Maximum Ratings @ $T_A=25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current (Continuous) *ACD	I_D	$T_A=25^\circ\text{C}$	12
		$T_A=70^\circ\text{C}$	9.4
Drain Current (Pulse) *B	I_{DM}	48	A
Power Dissipation	P_D	20.5	W
Operating Temperature/ Storage Temperature	T_J/T_{STG}	-55~150	$^\circ\text{C}$

● Thermal Resistance Ratings

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient	R_{thJA}	47	60	$^\circ\text{C/W}$
Maximum Junction-to-Case (Drain)	R_{thJC}	8	10	

● Electrical Characteristics @T_A=25°C unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	30	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0V	--	--	1	μA
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _{DS} = 250μA	1	1.8	2.5	V
Gate Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	--	--	±100	nA
Drain-Source On-state Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 20A	--	8.5	11	mΩ
	R _{DS(on)}	V _{GS} = 4.5V, I _D = 10A	--	13	17	mΩ
Diode Forward Voltage	V _{SD}	I _{SD} = 1A, V _{GS} = 0V	--	--	1	V
Diode Forward Current	I _S	TC = 25°C	--	--	10	A
Switching						
Total Gate Charge	Q _g	V _{GS} = 10V, V _{DS} = 15V, I _D = 12A	--	9	--	nC
Gate-Source Charge	Q _{gs}		--	1.4	--	nC
Gate-Drain Charge	Q _{gd}		--	1.9	--	nC
Turn-on Delay Time	t _{d(on)}	V _{DD} = 15V, R _L = 1.25Ω V _{GEN} = 10V, R _g = 3Ω	--	5	--	ns
Turn-on Rise Time	t _r		--	2.5	--	ns
Turn-off Delay Time	t _{d(off)}		--	17.5	--	ns
Turn-Off Fall Time	t _f		--	2.5	--	ns
Dynamic						
Input Capacitance	C _{iss}	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz	--	600	--	pF
Output Capacitance	C _{oss}		--	230	--	pF
Reverse Transfer Capacitance	C _{rss}		--	30	--	pF

A: The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A = 25°C. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the t_s 10s junction to ambient thermal resistance rating.

D: The maximum current rating is package limited.

● Typical Performance Characteristics (T_J = 25 °C, unless otherwise noted)

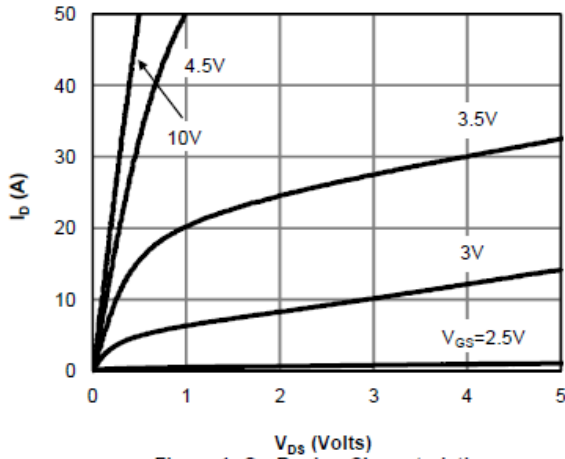


Figure 1: On-Region Characteristics

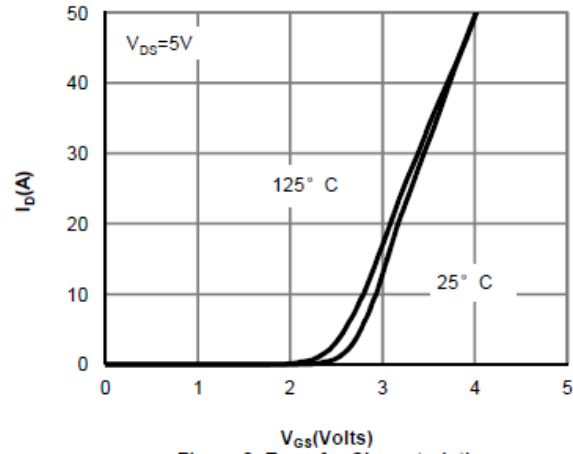


Figure 2: Transfer Characteristics

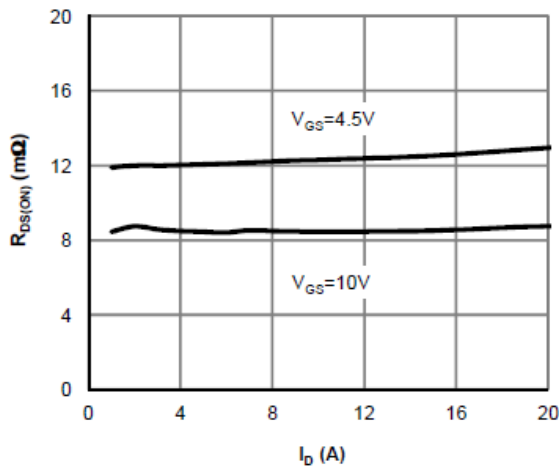


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

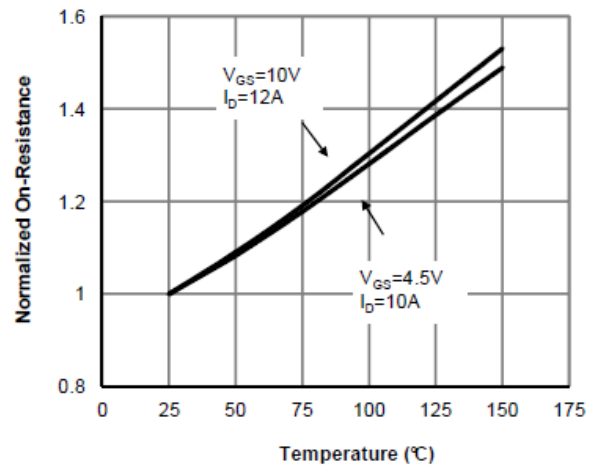


Figure 4: On-Resistance vs. Junction Temperature

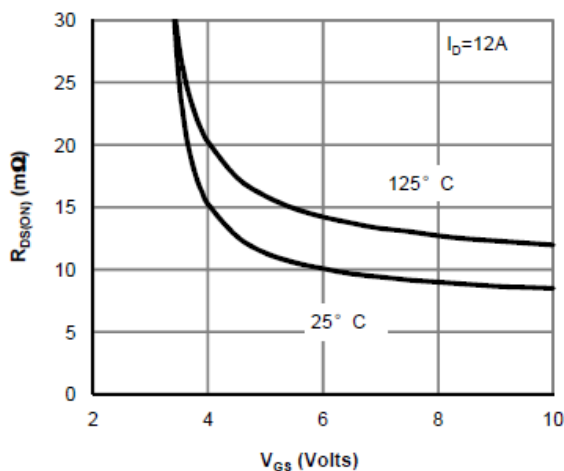


Figure 5: On-Resistance vs. Gate-Source Voltage

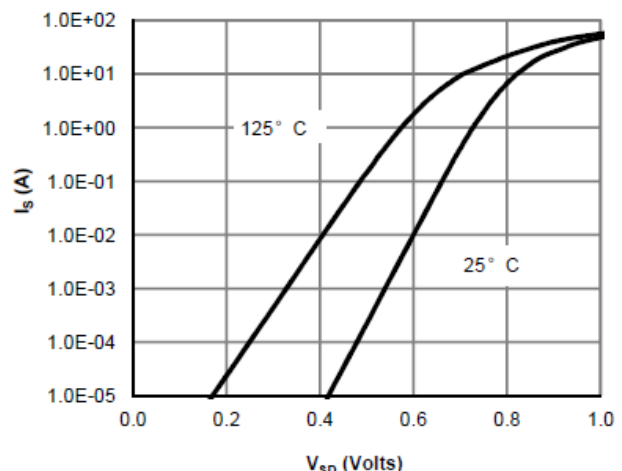


Figure 6: Body-Diode Characteristics

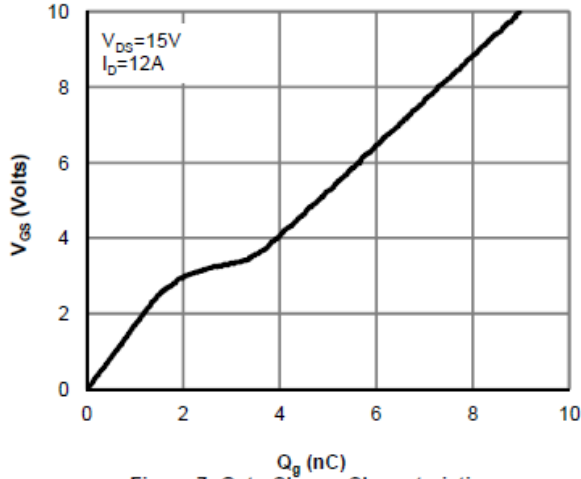


Figure 7: Gate-Charge Characteristics

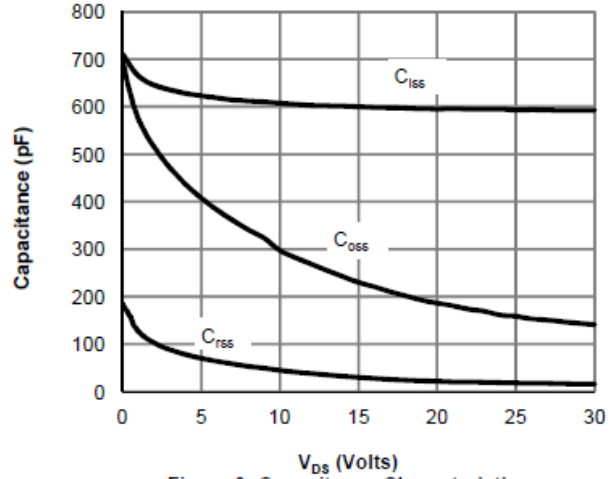


Figure 8: Capacitance Characteristics

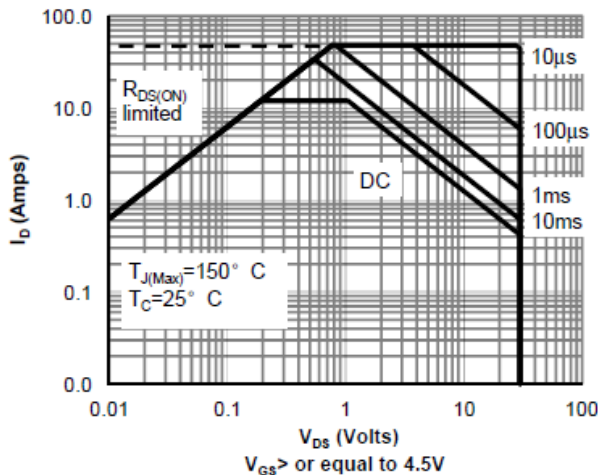


Figure 9: Maximum Forward Biased Safe Operating Area

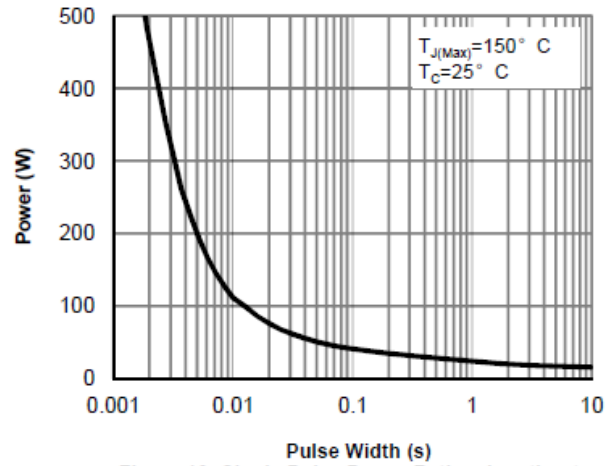


Figure 10: Single Pulse Power Rating Junction-to-Case

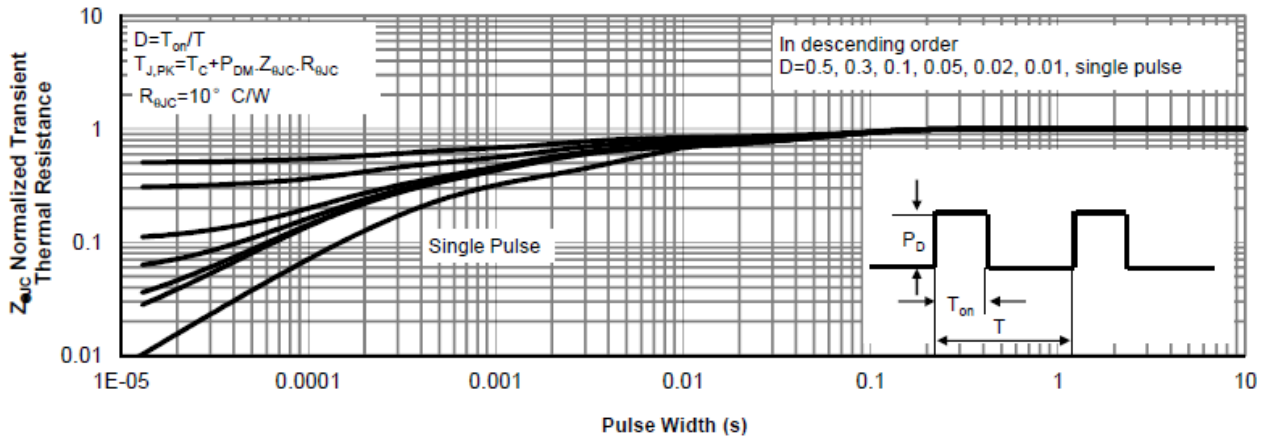


Figure 11: Normalized Maximum Transient Thermal Impedance

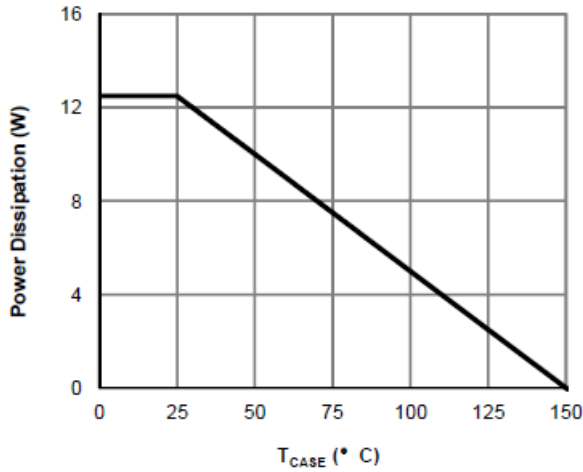


Figure 12: Power De-rating

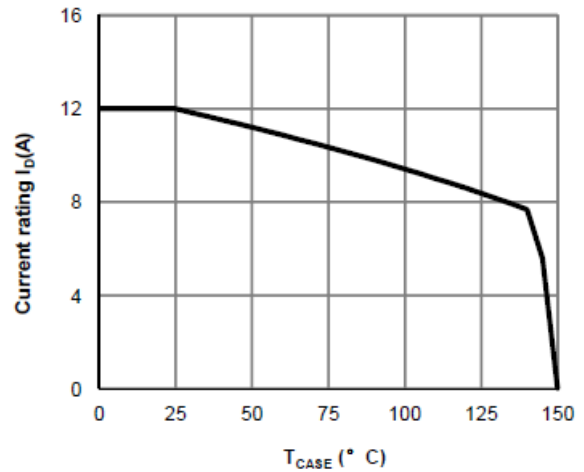


Figure 13: Current De-rating

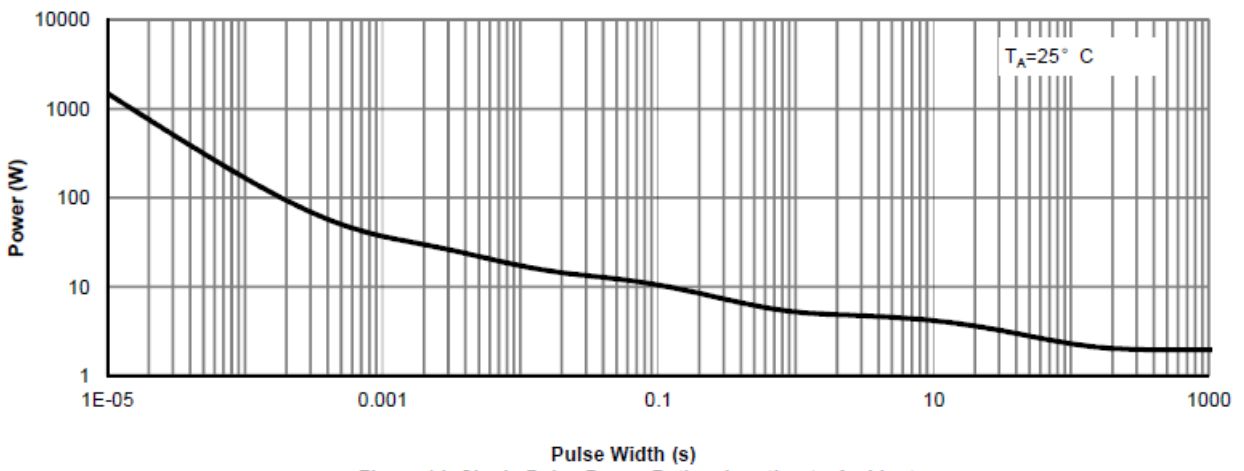


Figure 14: Single Pulse Power Rating Junction-to-Ambient

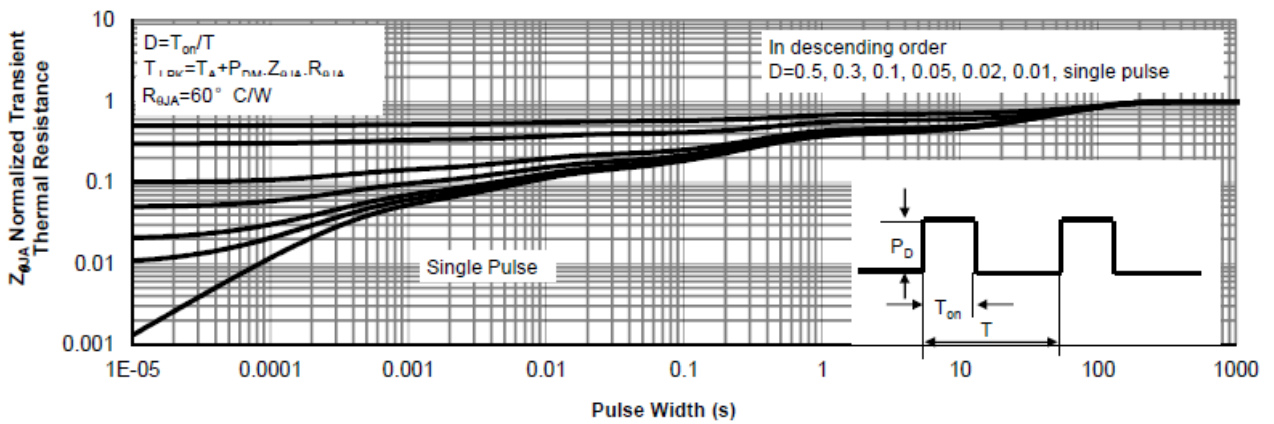
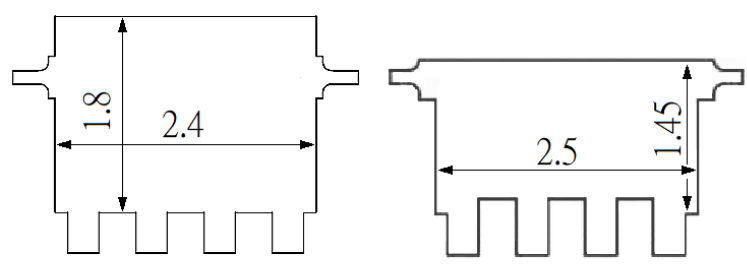
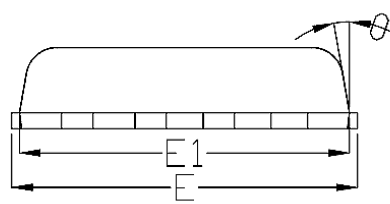
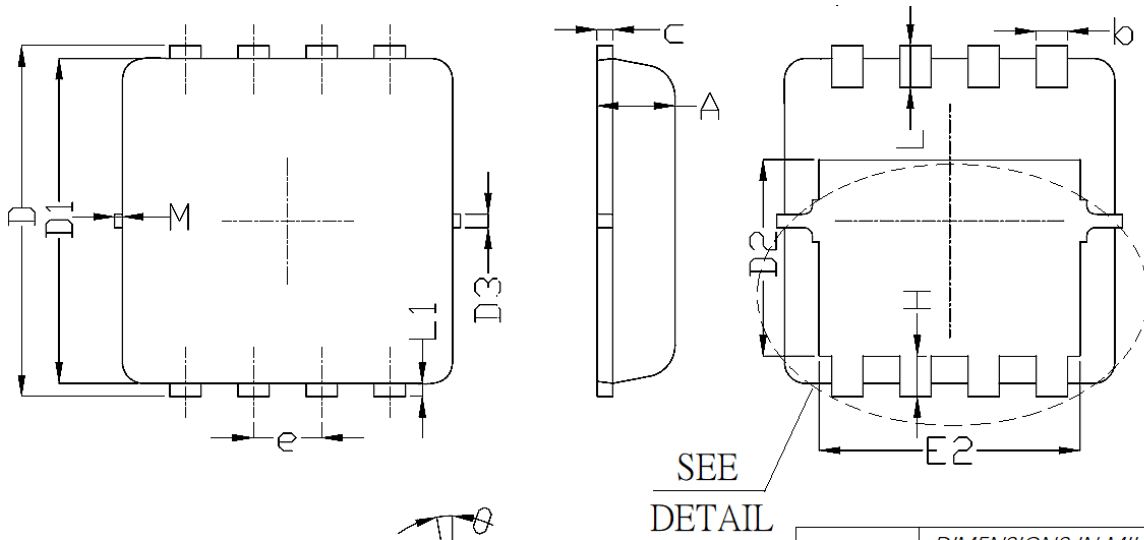


Figure 15: Normalized Maximum Transient Thermal Impedance

● Package Information



OPTION 1 OPTION 2

DETAIL

SYMBOL	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	0.7	0.775	0.85
b	0.25	0.3	0.35
c	0.1	0.15	0.25
D	3.15	3.3	3.4
D1	2.95	3.1	3.2
D2	1.7	1.8	1.93
D3		0.13	
E	3.05	3.25	3.35
E1	2.95	3.15	3.2
E2	2.3	2.4	2.55
e	0.65 BSC		
H	0.33	0.43	0.53
L	0.3	0.4	0.5
L1	0.08	0.13	0.18
θ	-	10°	12°
M	-	-	0.15