CMS4070M

40V N-Channel SGT

Description

Features

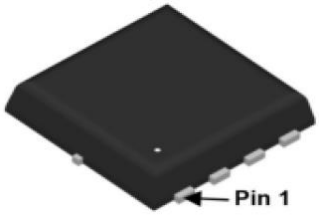
- SGT LV MOSFET technology
- Fast switching
- Improved dv/dt capability

Application

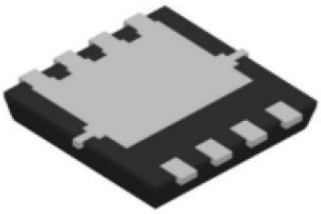
- MB/VGA/Vcore
- POL Application
- DC-DC

V_{DS}	40	V
$R_{ds(on),typ}$@V_{gs}=10V	5.2	mΩ
$R_{ds(on),typ}$@V_{gs}=4.5V	8.5	mΩ
I_D	70	A

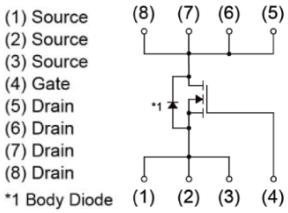
Top View



Bottom View



PDFN5*6 Pin Configuration



Package Marking and Ordering Information

Part	Marking	Package	Packing	Reel Size	Tape Width	Qty
CMS4070M	S4070M	PDFN5*6	Reel	NA	NA	5000pcs

Key Performance Parameters

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	±20	V
ID@Tc=25℃	Continuous Drain Current, VGS=10V	70	A
ID@Tc=100℃	Continuous Drain Current, VGS=10V	38	A
IDM	Pulsed Drain Current[1]	210	A
EAS	Single Pulse Avalanche Energy[4]	40	mJ
PD@Tc=25℃	Total Power Dissipation	55	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
j	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ	Max	Units
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	56	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	2.0	2.25	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
BVDSS	Drain-Source Breakdown Voltage	40	--	--	V	VGS=0V, ID=250uA
RDS(ON)	Static Drain-Source On-Resistance	--	5.2	7	mΩ	VGS=10V, ID=20A
		--	8.5	11.5		VGS=4.5V, ID=10A
VGS(th)	Gate Threshold Voltage	1.2	1.7	2.5	V	VGS=VDS, ID=250uA
IDSS	Drain-Source Leakage Current	--	--	1	uA	VDS=40V, VGS=0V, TJ=25℃
		--	--	10	uA	VDS=32V, VGS=0V, TJ=125℃
IGSS	Gate-Source Leakage Current	--	--	±100	nA	VGS=±20V, VDS=0V
gfs	Forward Transconductance	--	72	--	S	VDS=5V, ID=20A
Rg	Gate Resistance	--	1.9	--	Ω	VDS=0V, VGS=0V, f=1MHz
Qg	Total Gate Charge (10V)[2,3]	--	14	--	nC	VDS=20V, VGS=10V, ID=20A
Qgs	Gate-Source Charge[2,3]	--	3	--		
Qgd	Gate-Drain Charge[2,3]	--	6	--		
Td(on)	Turn-On Delay Time[2,3]	--	10	--	ns	VDD=20V, VGS=10V, RG=6Ω ID=20A
Tr	Rise Time[2,3]	--	14	--		
Td(off)	Turn-Off Delay Time[2,3]	--	28	--		
Tf	Fall Time[2,3]	--	18	--		
Ciss	Input Capacitance	--	1040	--	pF	VDS=20V, VGS=0V, f=1MHz
Coss	Output Capacitance	--	185	--		
Crss	Reverse Transfer Capacitance	--	170	--		

Diode Characteristics

Symbol	Parameter	Conditions	Typ	Max	Units
Is	Continuous Source Current	VG=VD=0V, Force Current	--	70	A
Ism	Pulsed Source Current		--	210	A
V_{SD}	Diode Forward Voltage	VGS=0V, IS=1A, TJ=25℃	--	1	V

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width ≦ 300us, duty cycle ≦ 2%.
3. Essentially independent of operating temperature.
4. The EAS data shows Max. rating. The test condition is V_{DD}=20V, V_{GS}=10V, L=0.5mH.

Typical Performance Characteristics

Fig1 Output Characteristics

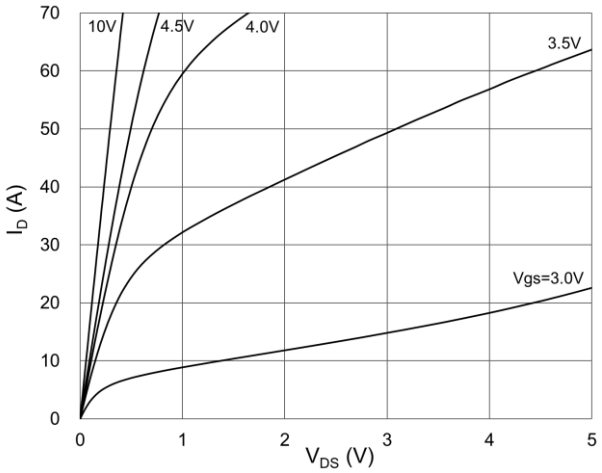


Fig2 Normalized R_{DSON} vs. T_J

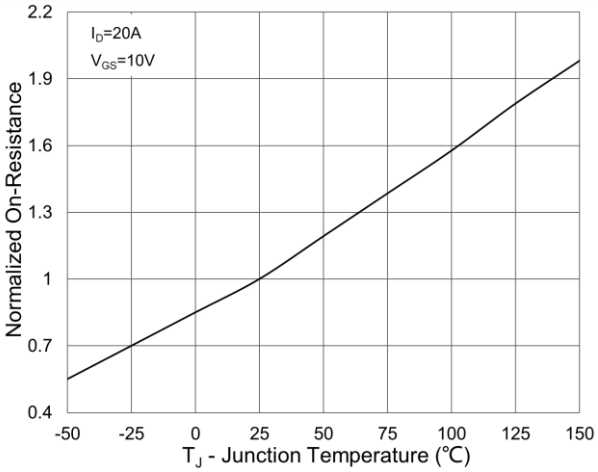


Fig3 Gate Charge Waveform

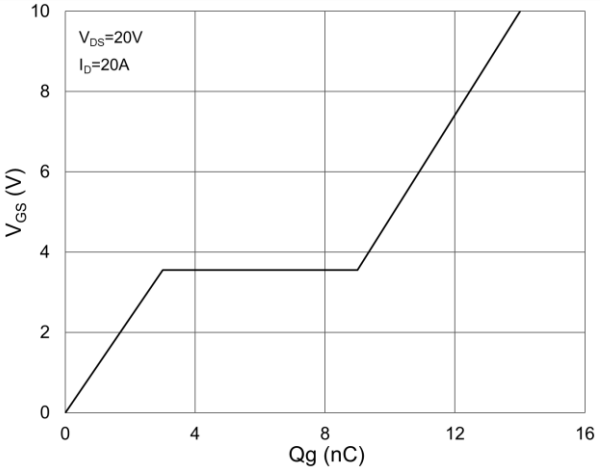


Fig4 Transfer Characteristics

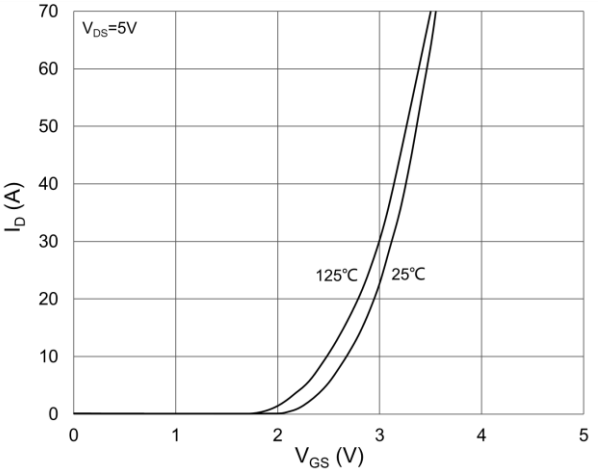


Fig5 Rds(on) vs. Drain Current and Gate Voltage

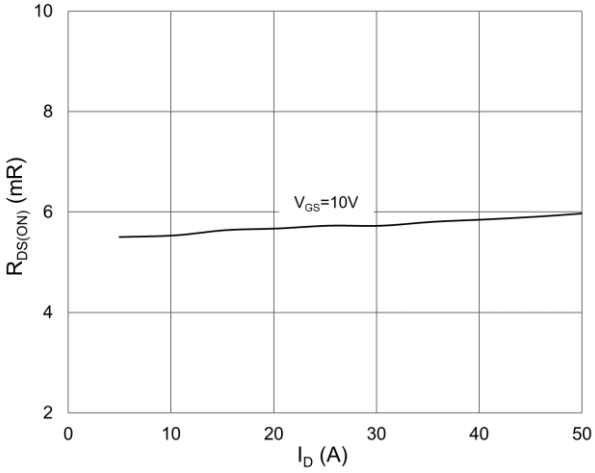


Fig6 Rds(on) vs. Gate Voltage

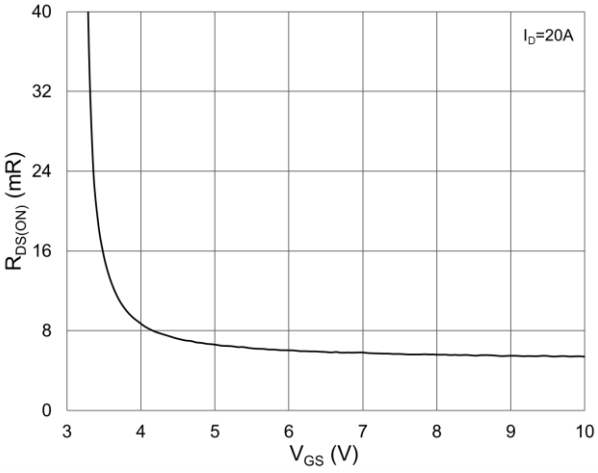


Fig7 Capacitance Characteristics

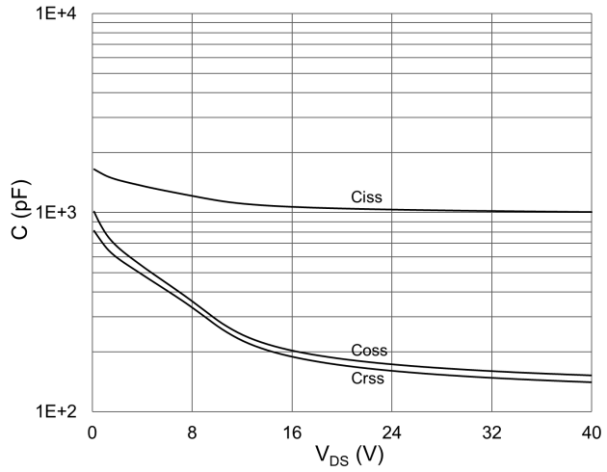


Fig8 Drain Current Derating

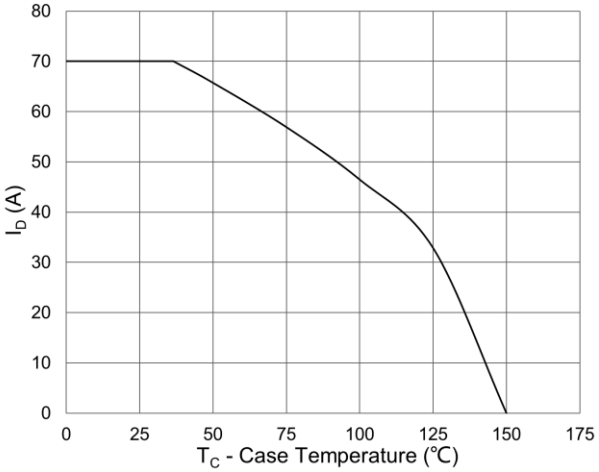


Fig9 Power Dissipation

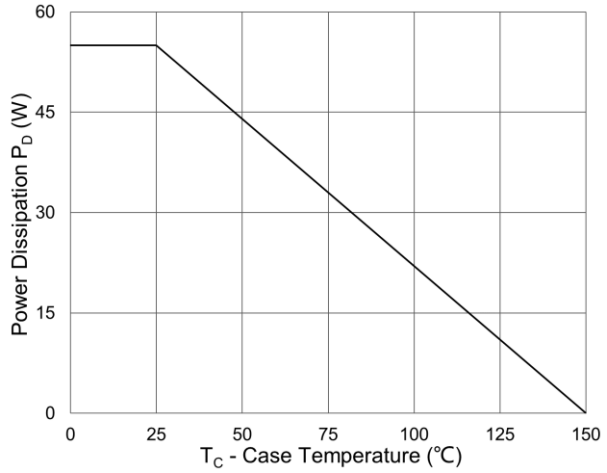


Fig10 Maximum Safe Operation Area

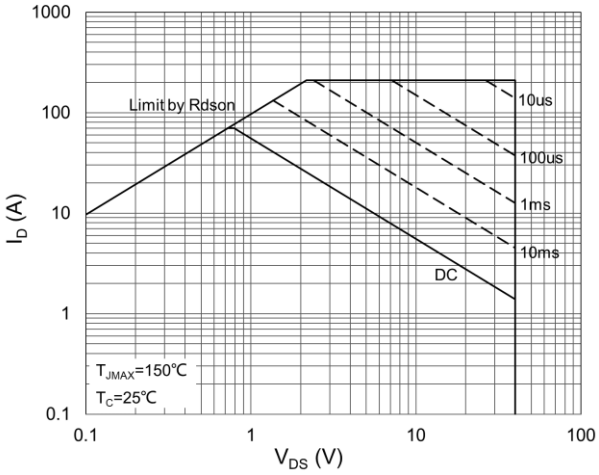
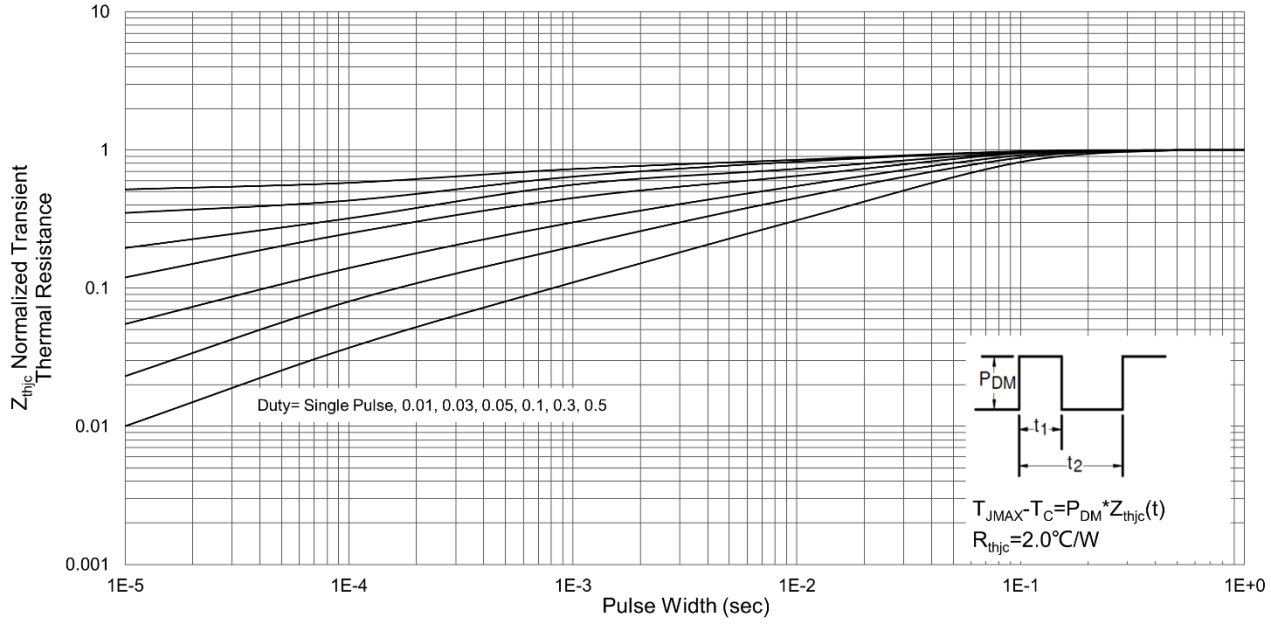
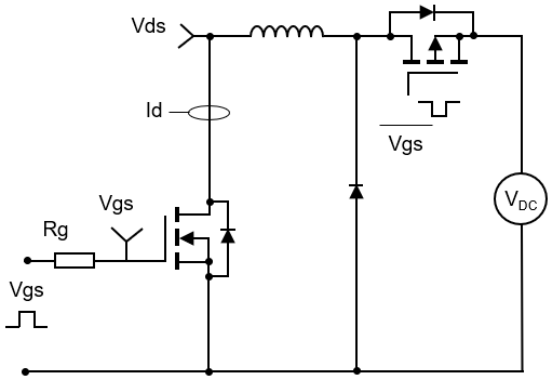


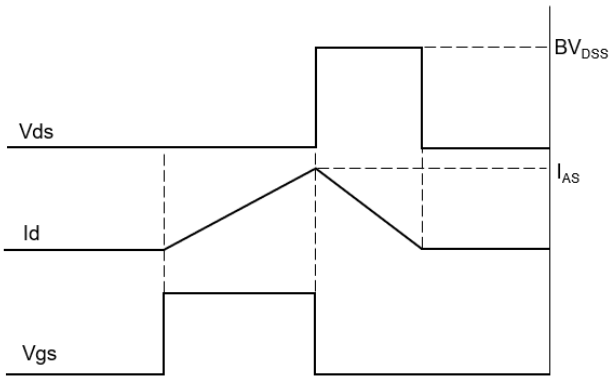
Fig11 Normalized Transient Impedance



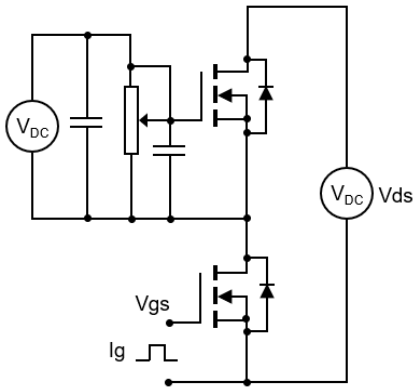
Test Circuit & Waveform

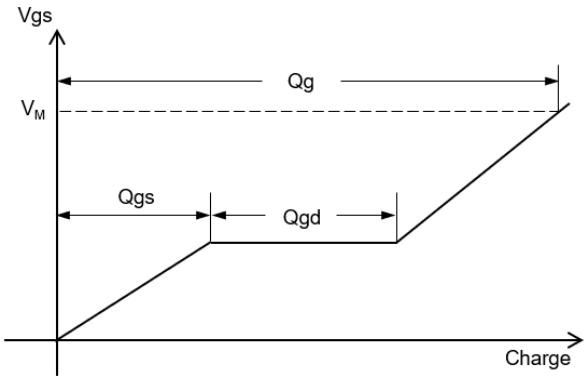
1. Unclamped Inductive Switching Test Circuit & Waveform



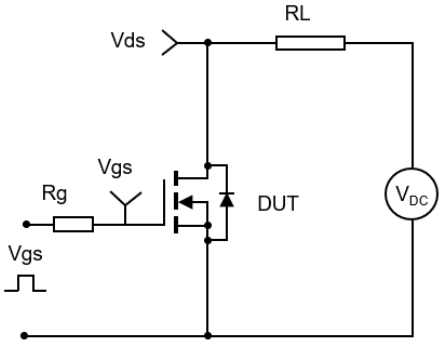


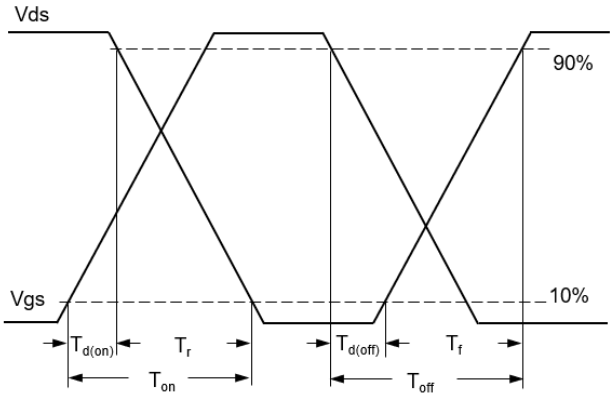
2. Gate Charge Test Circuit & Waveform



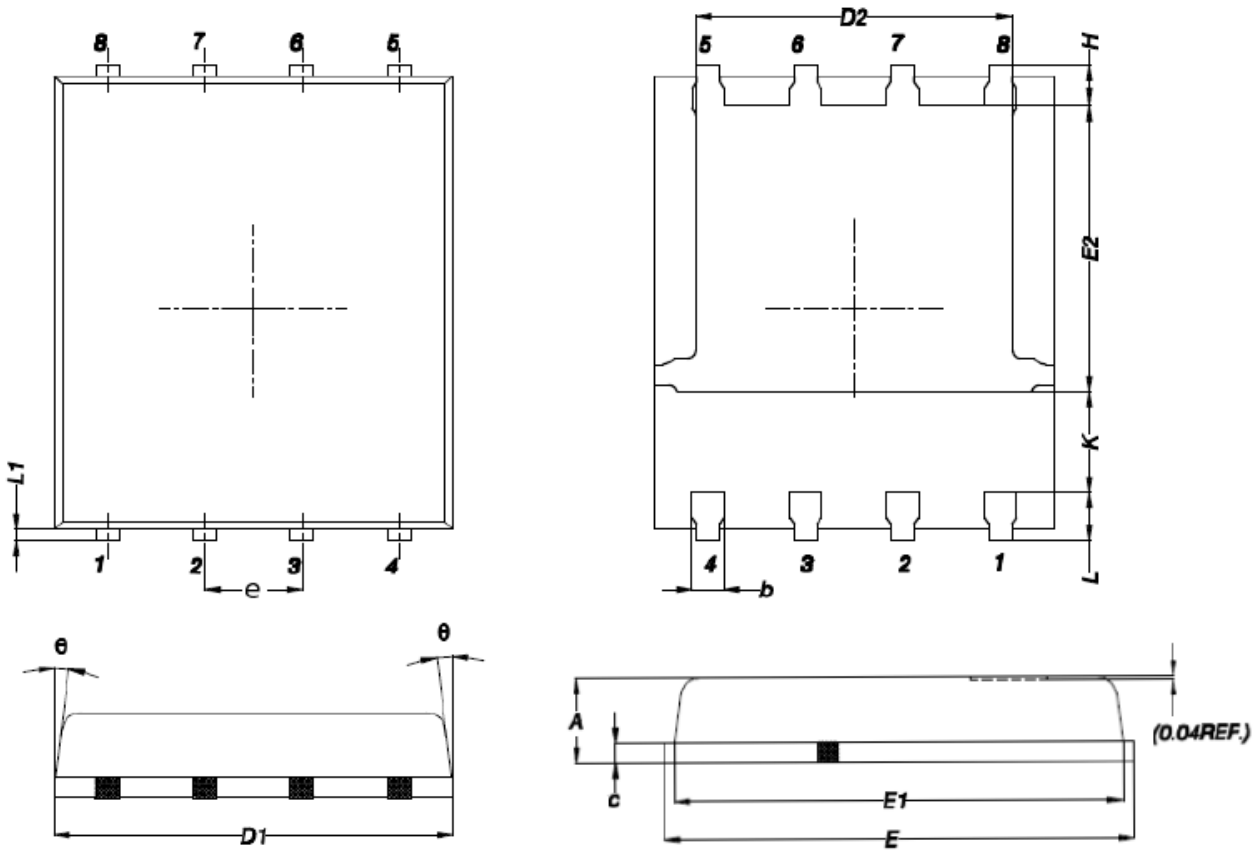


3. Resistive Switching Test Circuit & Waveform





PDFN5*6 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.200	0.850	0.047	0.031
b	0.510	0.330	0.020	0.013
C	0.300	0.200	0.012	0.008
D1	5.400	4.800	0.212	0.189
D2	4.310	3.610	0.170	0.142
E	6.300	5.850	0.248	0.230
E1	5.960	5.450	0.235	0.215
E2	3.920	3.300	0.154	0.130
e	1.27BSC		0.05BSC	
H	0.650	0.380	0.026	0.015
K	---	1.100	---	0.043
L	0.710	0.380	0.028	0.015
L1	0.250	0.050	0.009	0.002
θ	12°	0°	12°	0°