P-Channel Enhancement Mode Power MOSFET

Description

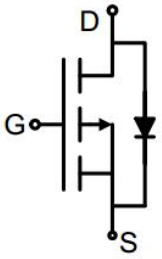
The GT038P06M uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

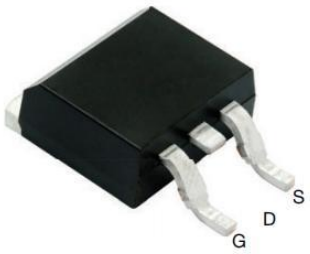
- V_{DS} -60V
- I_D (at V_{GS} = -10V) -200A
- $R_{DS(ON)}$ (at V_{GS} = -10V) < 4.5mΩ
- $R_{DS(ON)}$ (at V_{GS} = -4.5V) < 6.5mΩ
- 100% Avalanche Tested
- RoHS Compliant

Application

- Power switch
- DC/DC converters



Schematic diagram



TO-263

Ordering Information

Device	Package	Marking	Packaging
GT038P06M	TO-263	GT038P06	800pcs/Reel

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-60	V
Continuous Drain Current	I_D	-200	A
Pulsed Drain Current (note1)	I_{DM}	-800	A
Gate-Source Voltage	V_{GS}	±20	V
Power Dissipation	P_D	350	W
Single pulse avalanche energy （note2）	E_{AS}	961	mJ
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 To 150	ºC

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	R_{thJA}	50	ºC/W
Maximum Junction-to-Case	R_{thJC}	0.36	ºC/W

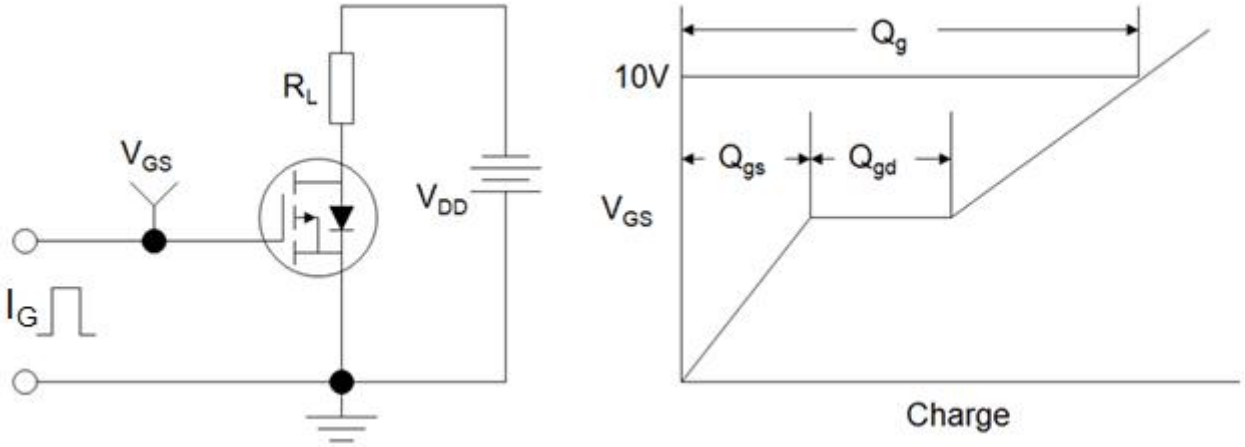
Specifications T_J = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-60	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -60V, V_{GS} = 0V	--	--	-1	μA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-1.0	-1.8	-2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D = -50A	--	3.6	4.5	mΩ
		V_{GS} = -4.5V, I_D = -50A	--	4.9	6.5	
Forward Transconductance	g_{FS}	V_{DS} = -5V,I_D = -50A	--	84	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -30V, f = 0.3MHz	--	11988	--	pF
Output Capacitance	C_{oss}		--	1695	--	
Reverse Transfer Capacitance	C_{rss}		--	113	--	
Total Gate Charge	Q_g	V_{DD} = -30V, I_D = -50A, V_{GS} = -10V	--	386	--	nC
Gate-Source Charge	Q_{gs}		--	42	--	
Gate-Drain Charge	Q_{gd}		--	104	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = -30V, I_D = -50A, R_G = 1.6Ω	--	30	--	ns
Turn-on Rise Time	t_r		--	46	--	
Turn-off Delay Time	$t_{d(off)}$		--	381	--	
Turn-off Fall Time	t_f		--	101	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	-200	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = -50A, V_{GS} = 0V	--	--	-1.2	V
Reverse Recovery Charge	Q_{rr}	I_F = -50A, V_{GS} = 0V di/dt=-100A/us	--	446	--	nC
Reverse Recovery Time	T_{rr}		--	120	--	ns

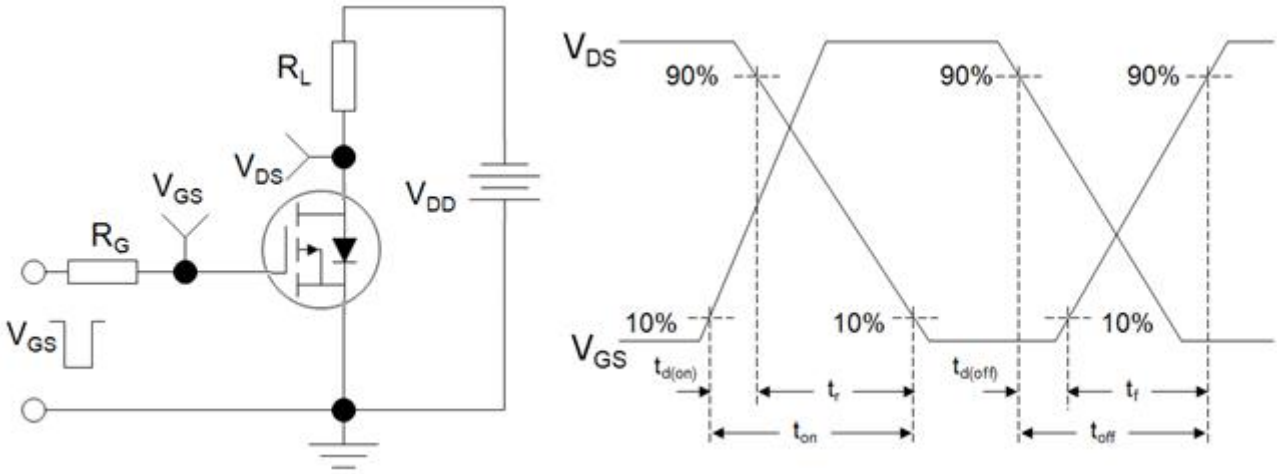
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. EAS condition : Tj=25℃ ,VDD=-50V,VGS=-10V,L=0.5mH,Rg=25Ω
   The table shows the minimum avalanche energy, which is 2652mJ when the device is tested until failure
3. Identical low side and high side switch with identical R_G

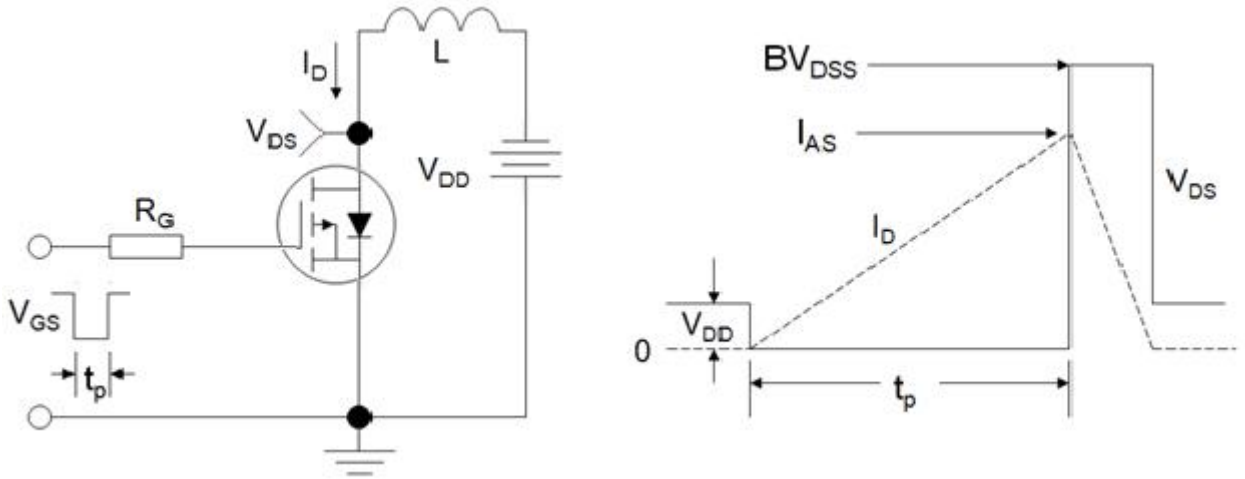
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

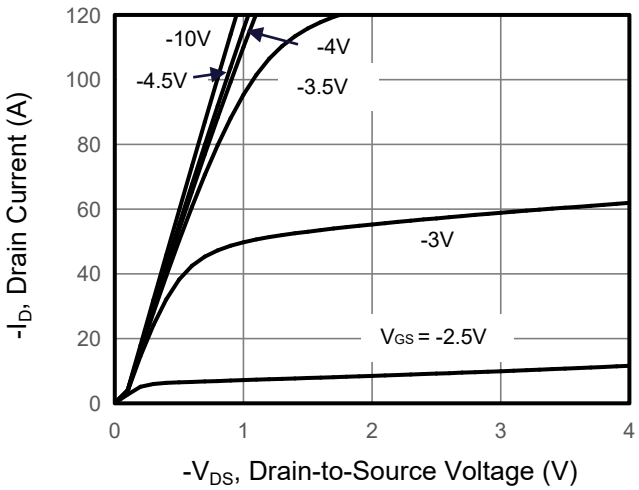


Figure 2. Transfer Characteristics

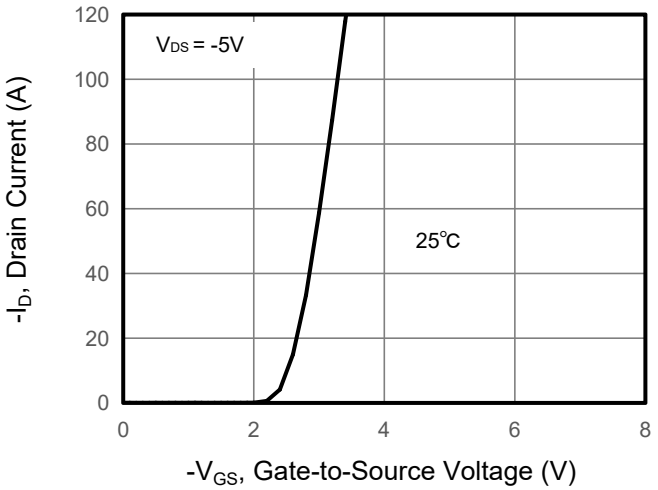


Figure 3.Drain Source On Resistance

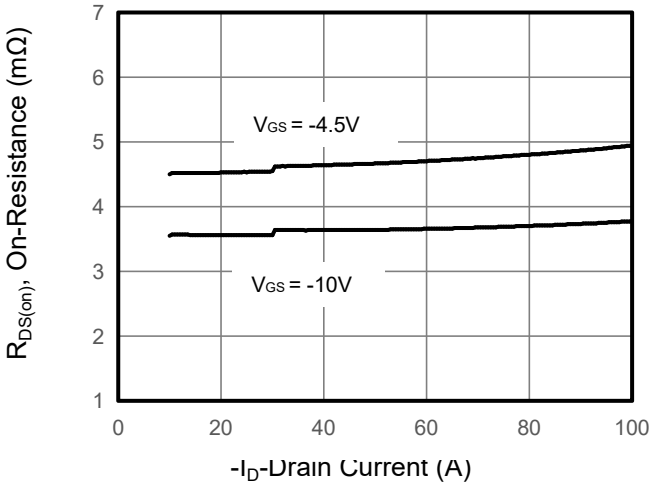


Figure 4. Gate Charge

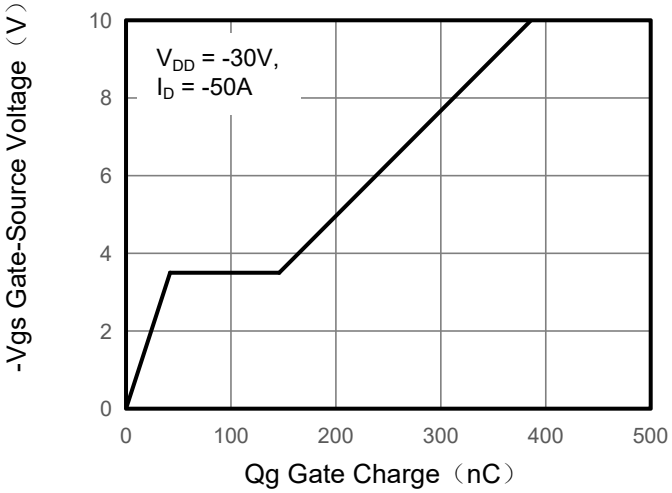


Figure 5. Capacitance

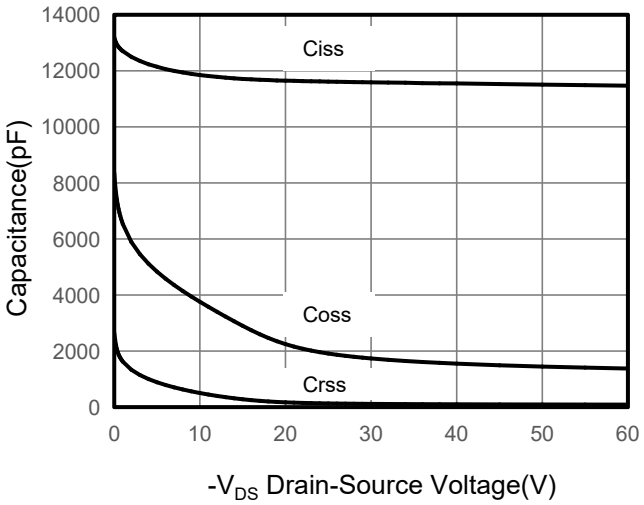
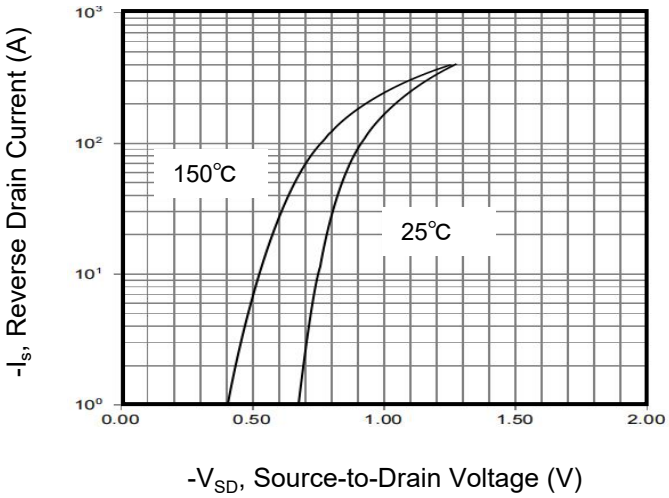


Figure 6. Source-Drain Diode Forward



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

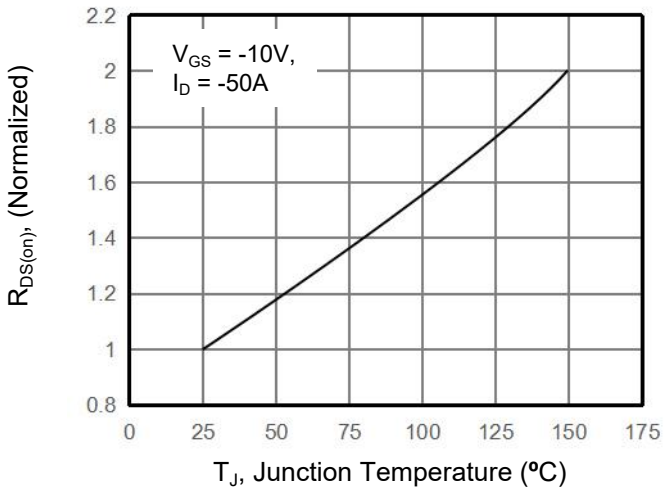


Figure 10. Safe Operation Area

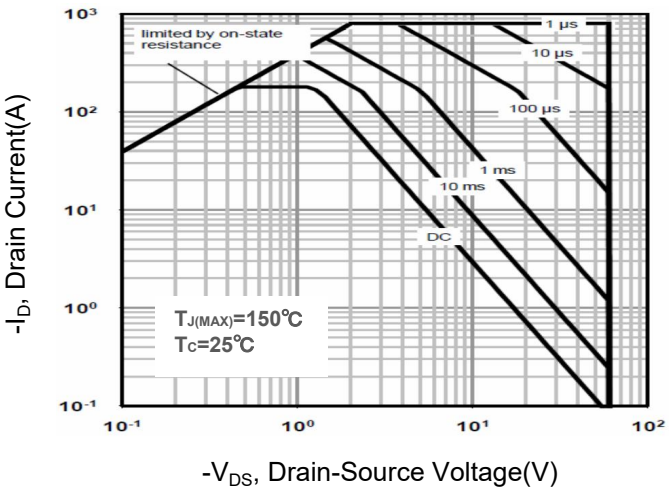
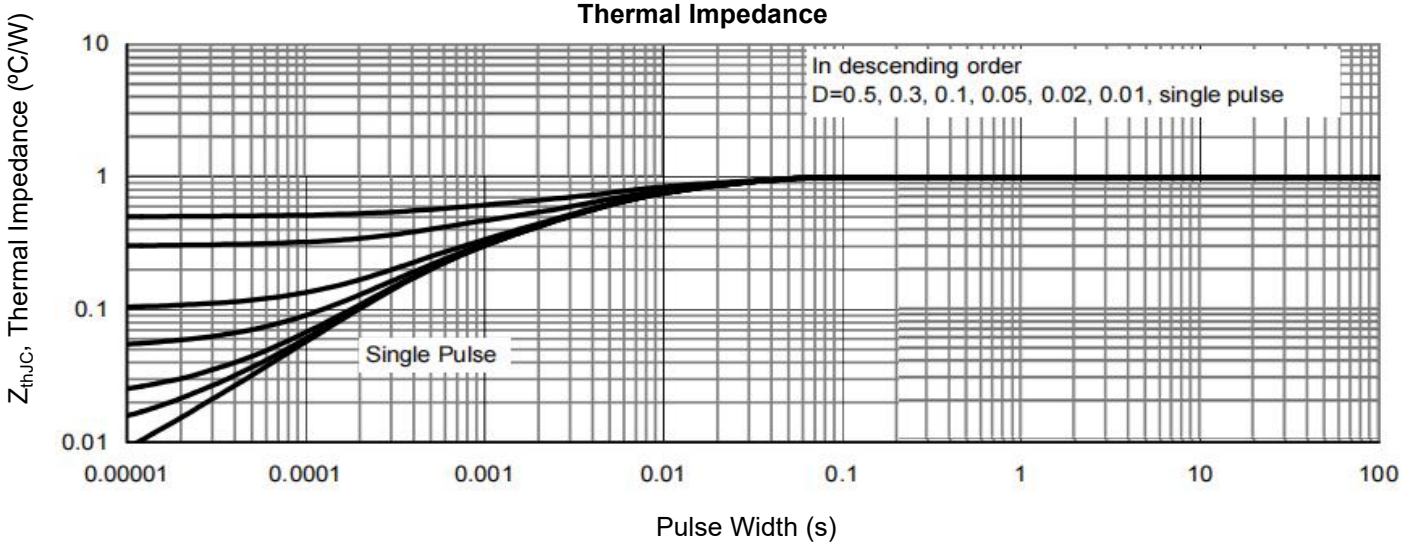
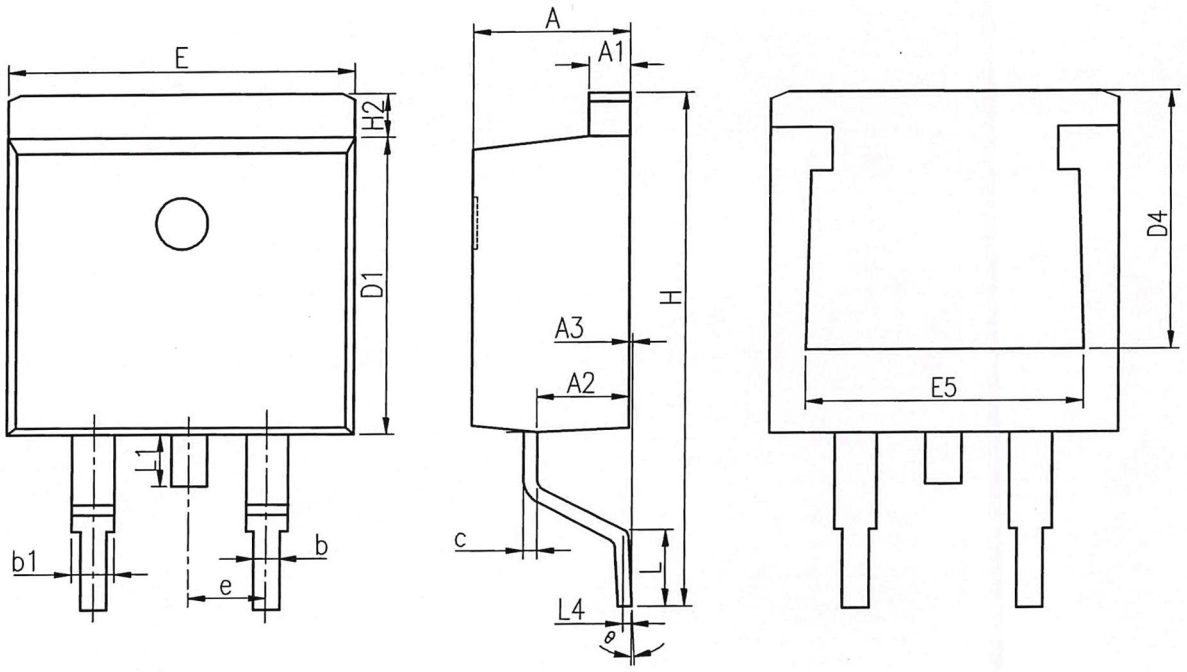


Figure 9. Normalized Maximum Transient Thermal Impedance



TO-263 Package Information



COMMON DIMENSIONS

SYMBOL	MM			SYMBOL	MM		
	MIN	NOM	MAX		MIN	NOM	MAX
A	4.37	4.57	4.77	E	9.86	10.16	10.36
A1	1.22	1.27	1.42	E5	7.06	-	-
A2	2.49	2.69	2.89	e		2.54 BSC	
A3	0.00	0.13	0.25	H	14.70	15.10	15.50
b	0.70	0.81	0.96	H2	1.07	1.27	1.47
b1	1.17	1.27	1.47	L	2.00	2.30	2.60
c	0.30	0.38	0.53	L1	1.40	1.55	1.70
D1	8.50	8.70	8.90	L4		0.25 BSC	
D4	6.60	-	-	θ	0°	5°	9°