PE4435A

P-Channel Enhancement Mode Power MOSFET

DESCRIPTION

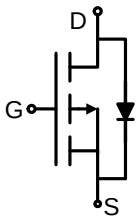
The PE4435A uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as -4.5V.

GENERAL FEATURES

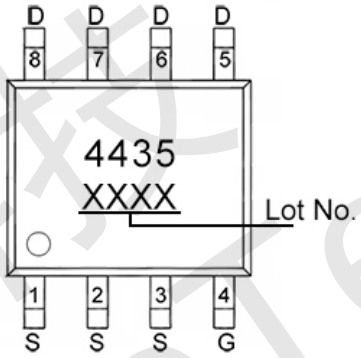
- V_{DS} > -30V,I_D = -10.5A
  $R_{DS(ON)}$ < 20mΩ @ V_{GS}=-10V
  $R_{DS(ON)}$ < 35mΩ @ V_{GS}=-4.5V
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

Application

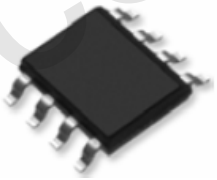
- Battery Switch
- Load switch
- Power management



Schematic diagram



Marking and pin Assignment



SOP-8 top view

Absolute Maximum Ratings (TA=25℃unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current (T_J =150℃)	T_C =25℃	I_D	-10.5	A
	T_C =70℃		-7.5	
	T_A =25℃		-7.8	
	T_A =70℃		-6	
Drain Current-Pulsed (Note 1)		I_{DM}	-50	A
Maximum Power Dissipation		P_D	3.1	W
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	40	℃/W

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Electrical Characteristics (T_A=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250μA	-30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V,V_{GS}=0V	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-1	-1.6	-2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-9A	10	14	20	mΩ
		V_{GS}=-4.5V, I_D=-7A	20	23	35	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-15V,I_D=-9A	-	22	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=-15V,V_{GS}=0V, F=1.0MHz	-	1470	-	PF
Output Capacitance	C_{oss}		-	181	-	PF
Reverse Transfer Capacitance	C_{rss}		-	167	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-15V, ID=-1A, V_{GS}=-10V,R_{GEN}=6Ω	-	10	-	nS
Turn-on Rise Time	t_r		-	15	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	18	-	nS
Turn-Off Fall Time	t_f			70	-	nS
Total Gate Charge	Q_g	V_{DS}=-15V,I_D=-9A V_{GS}=-10V	-	18	-	nC
Gate-Source Charge	Q_{gs}		-	5.5	-	nC
Gate-Drain Charge	Q_{gd}		-	3.3	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=-1A	-	-	-1.2	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

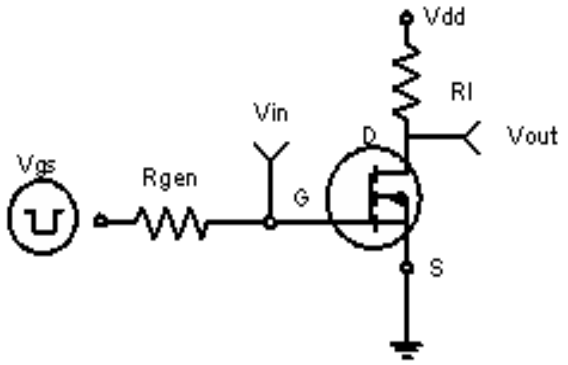

Figure 1:Switching Test Circuit

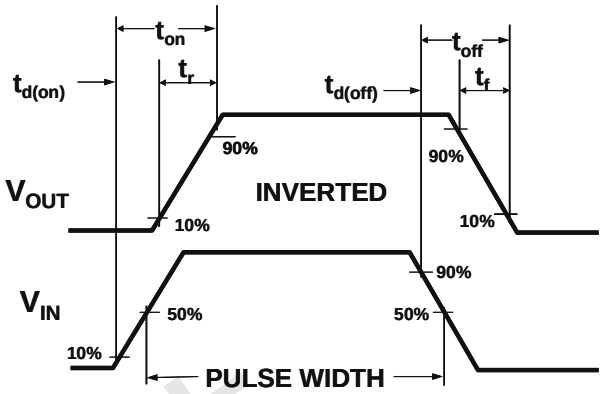

Figure 2:Switching Waveforms

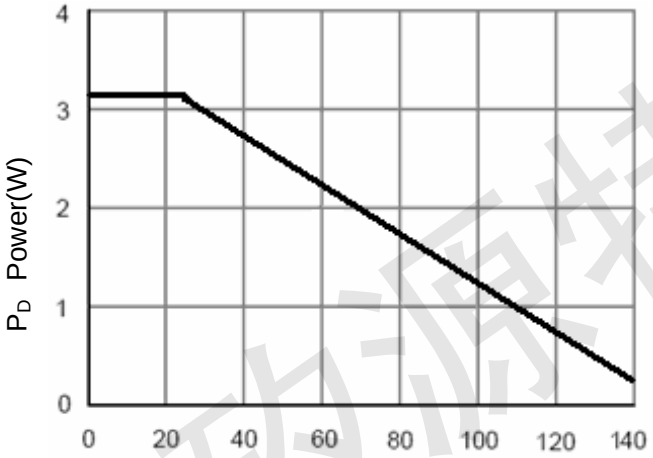

Figure 3 Power Dissipation

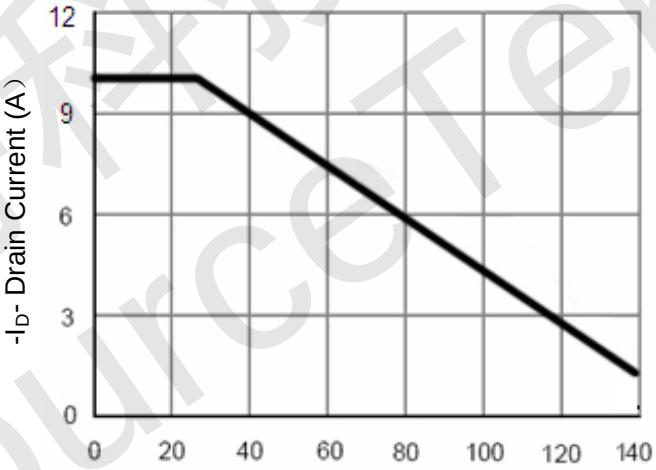

Figure 4 Drain Current

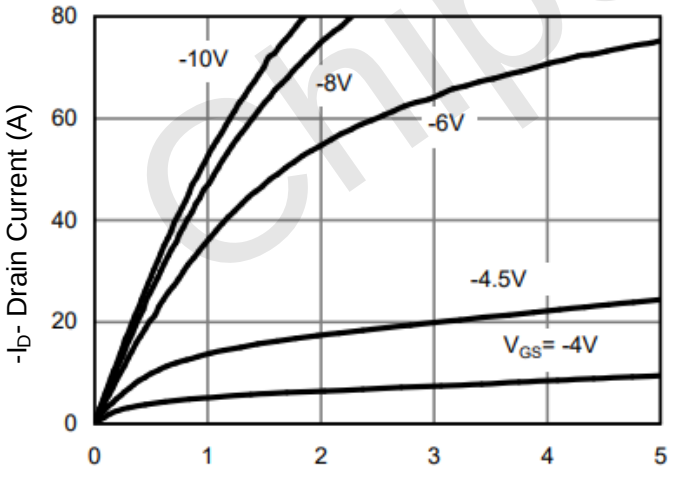

Figure 5 Output CHARACTERISTICS

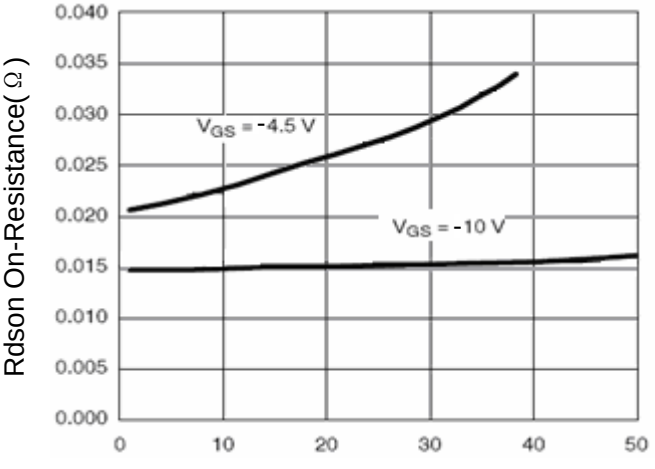

Figure 6 Drain-Source On-Resistance

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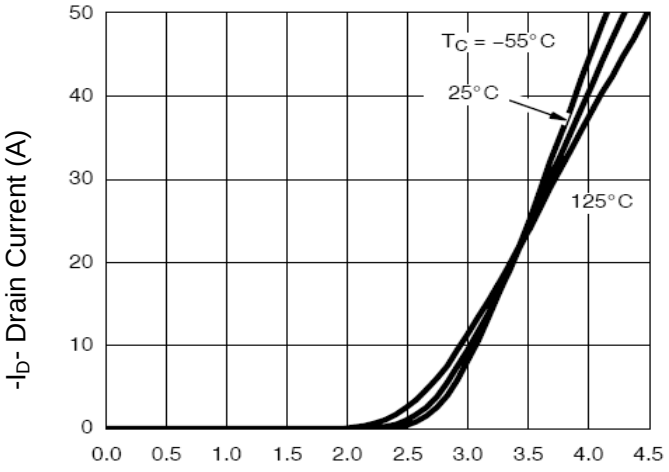

Figure 7 Transfer Characteristics

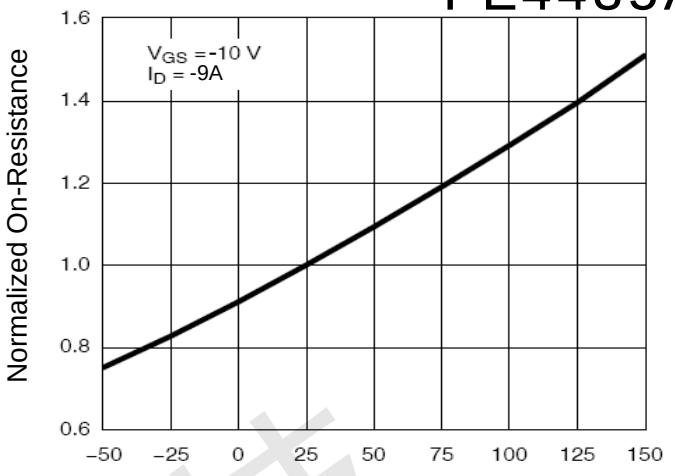

Figure 8 Drain-Source On-Resistance

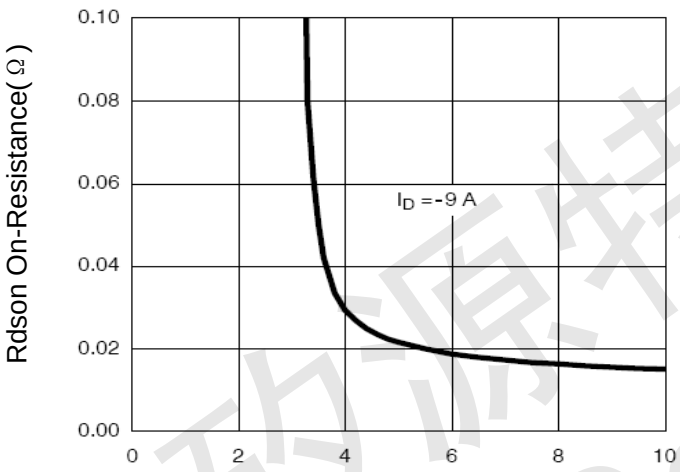

Figure 9 Rdson vs Vgs

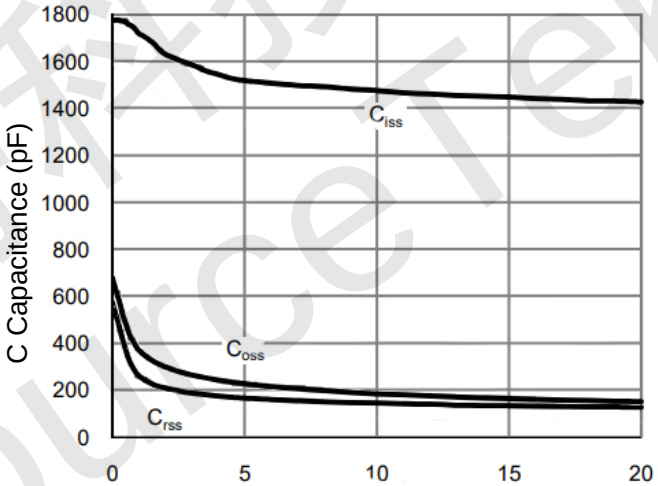

Figure 10 Capacitance vs Vds

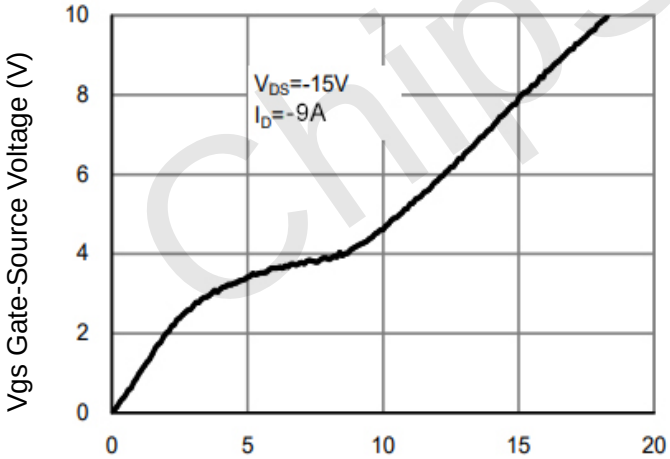

Figure 11 Gate Charge

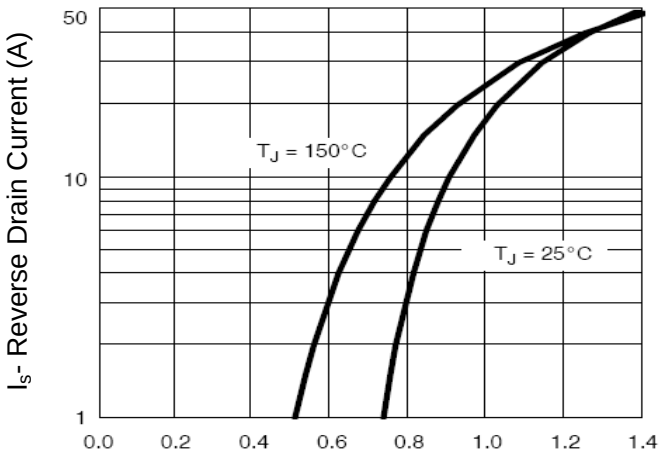

Figure 12 Source- Drain Diode Forward

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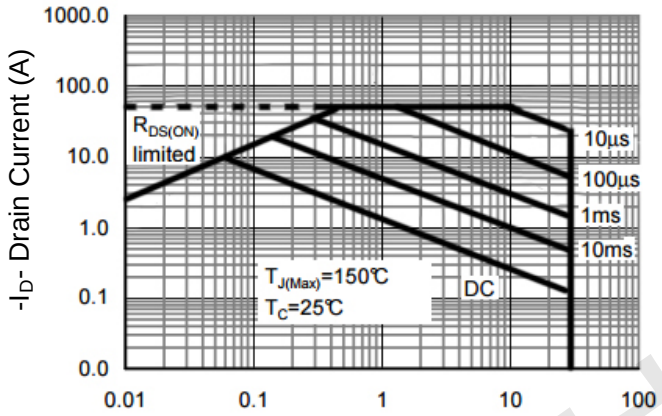

Figure 13 Safe Operation Area

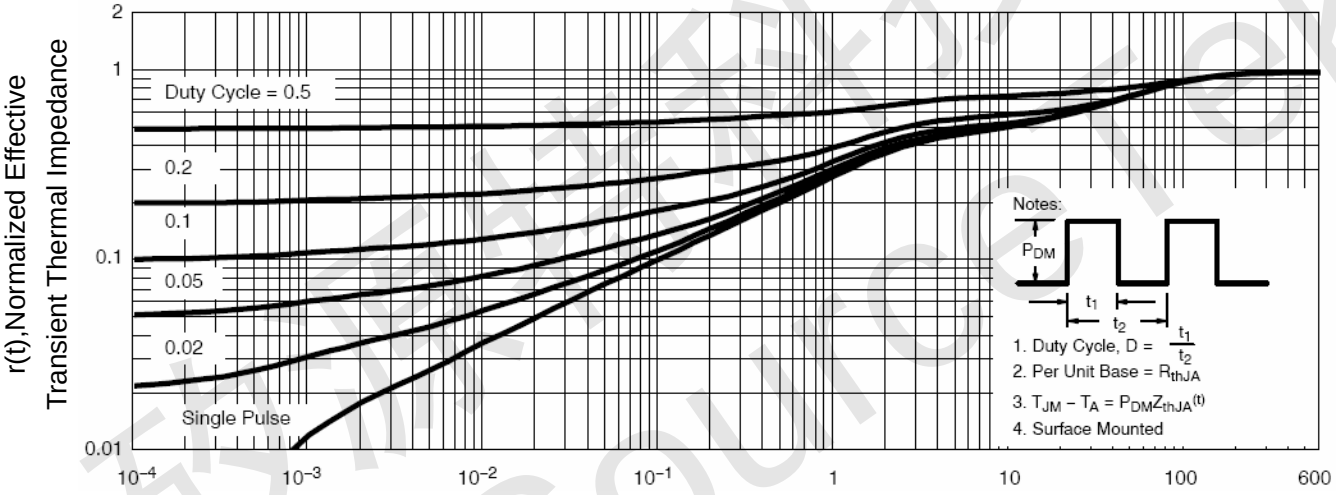

Figure 14 Normalized Maximum Transient Thermal Impedance

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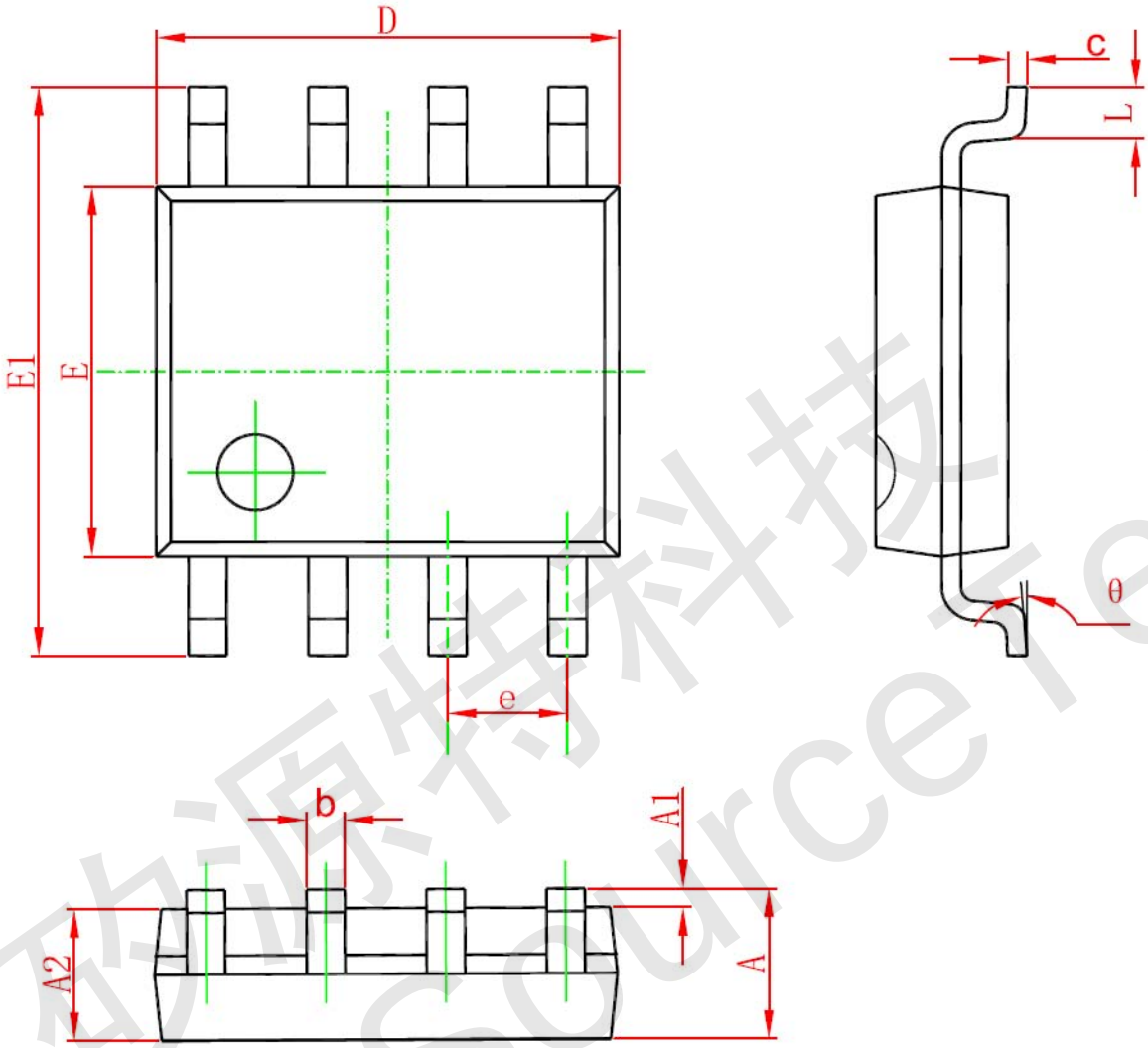
SOP-8 PACKAGE IN FORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°