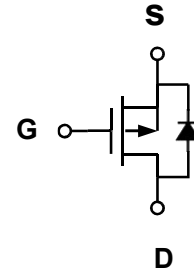




**P-Channel Enhancement Mode Power MOSFET**

**Description**

The MX3407 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ . This device is suitable for use as a load switch or in PWM applications.



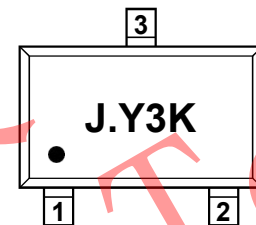
Schematic diagram

**General Features**

- ◆  $V_{DS} = -30V$ ,  $I_D = -4.3A$
- ◆  $R_{DS(ON)}(Typ.) < 100m\Omega @ V_{GS} = -4.5V$
- ◆  $R_{DS(ON)}(Typ.) < 50m\Omega @ V_{GS} = -10V$
- ◆ High power and current handling capability
- ◆ Lead free product is acquired
- ◆ Surface mount package

**Application**

- ◆ PWM applications
- ◆ Load switch
- ◆ Power management



Marking and pin assignment



Sot-23-3 top view

**Ordering Information**

Part Number	Marking	Storage Temperature	Package	Devices Per Reel
MX3407	J.Y3K	-55°C to +150°C	SOT-23-3	3000

**Absolute Maximum Ratings (TA=25°C unless otherwise noted)**

parameter	symbol	limit	unit
Drain-source voltage	$V_{DS}$	-30	V
Gate-source voltage	$V_{GS}$	$\pm 20$	V
Drain current-continuous	$I_D$	-4.3	A
Drain Current-Pulsed (Note 1)	$I_{DM}$	-20	A
Drain-source Diode forward current	$I_S$	-1.25	A
Maximum power dissipation	$P_D$	1.5	W
Operating junction Temperature range	$T_j$	-55—150	°C



**Electrical Characteristics** (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Drain-source breakdown voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=-24V, V_{GS}=0V$	-	-	-1	$\mu A$
Gate-body leakage	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	$\pm 100$	nA
<b>ON Characteristics</b>						
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.4	-1.6	-2.4	V
Drain-source on-state resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-4.3A$	-	38	50	m $\Omega$
		$V_{GS}=-4.5V, I_D=-4A$	-	60	100	m $\Omega$
Forward transconductance	$g_{fs}$	$V_{GS}=-5V, I_D=-4.1A$	5.5	-	-	S
<b>Dynamic Characteristics</b>						
Input capacitance	$C_{ISS}$	$V_{DS}=-15V, V_{GS}=0V$ $f=1.0MHz$	-	700	-	pF
Output capacitance	$C_{OSS}$		-	120	-	
Reverse transfer capacitance	$C_{RSS}$		-	75	-	
<b>Switching Characteristics</b>						
Turn-on delay time	$t_{D(ON)}$	$V_{DD}=-15V$ $RL=3.6\Omega$	-	9	-	ns
Rise time	$t_r$		-	5	-	
Turn-off delay time	$t_{D(OFF)}$	$V_{GS}=-10V$ $R_{GEN}=3\Omega$	-	28	-	
Fall time	$t_f$		-	13.5	-	
Total gate charge	$Q_g$	$V_{DS}=-15V, I_D=-4.2A$ $V_{GS}=-4.5V$	-	14	-	nC
Gate-source charge	$Q_{gs}$		-	3.1	-	
Gate-drain charge	$Q_{gd}$		-	3.	-	
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
Diode forward voltage	$V_{SD}$	$V_{GS}=0V, I_S=-4.2A$	-	-	-1.2	V

**Notes:**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to product



Typical Performance Characteristics

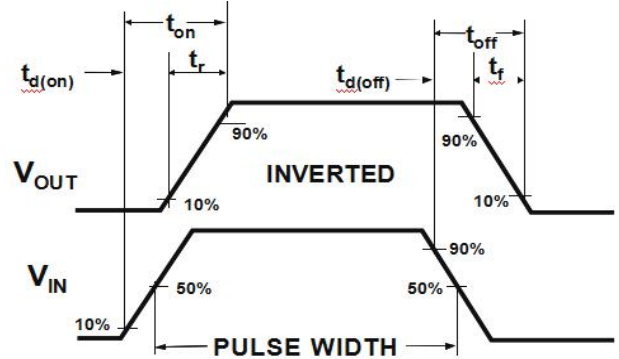
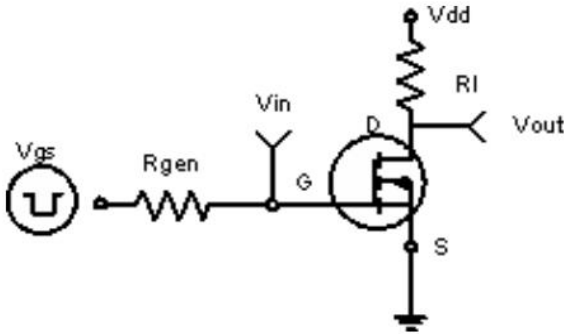


Figure 1: Switching Test Circuit

Figure 2: Switching Waveforms

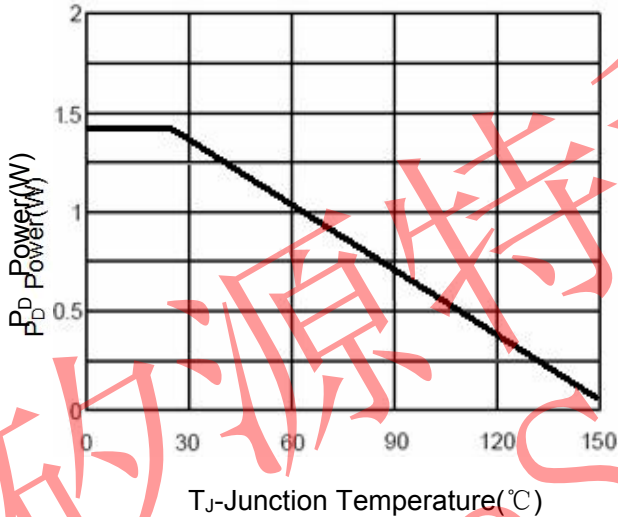


Figure 3 Power Dissipation

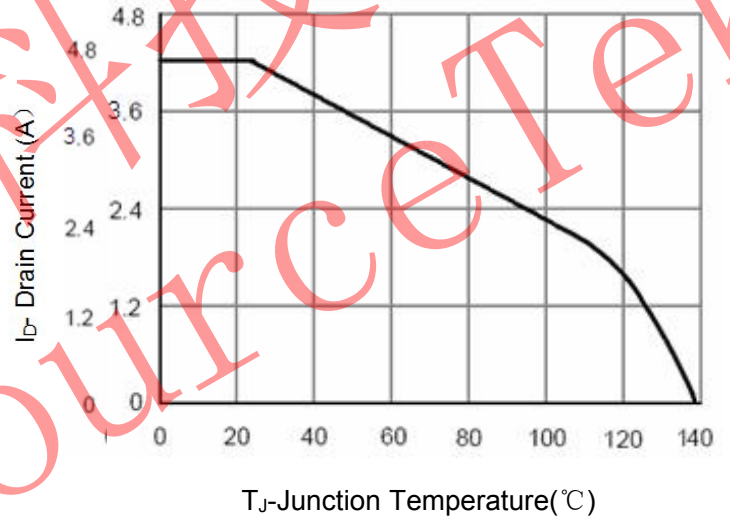


Figure 4 Drain Current

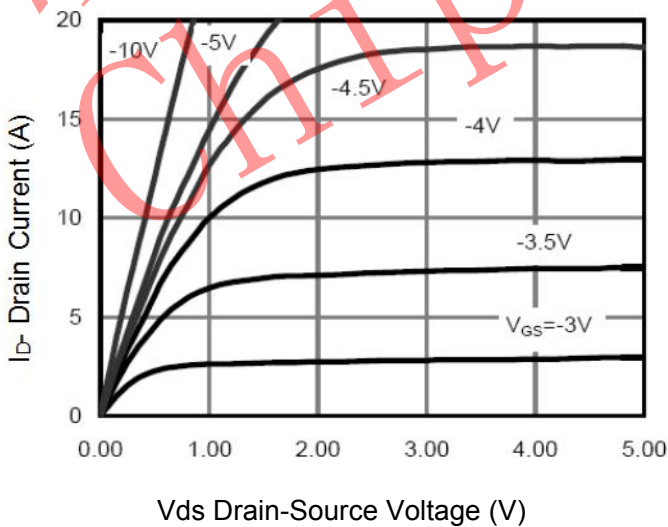


Figure 5 Output CHARACTERISTICS

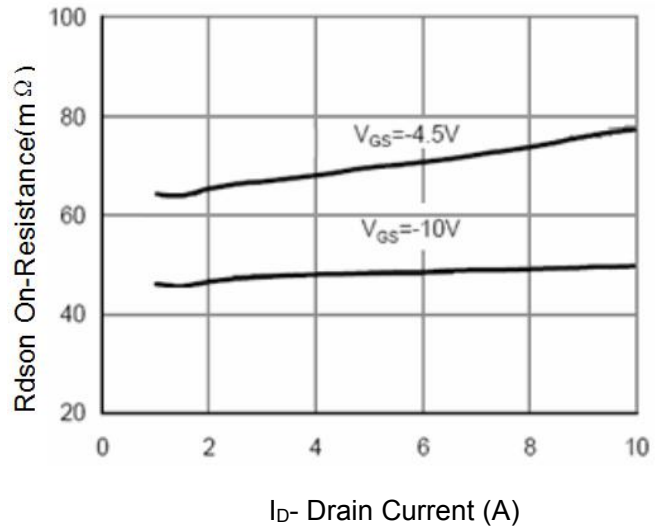


Figure 6 Drain-Source On-Resistance

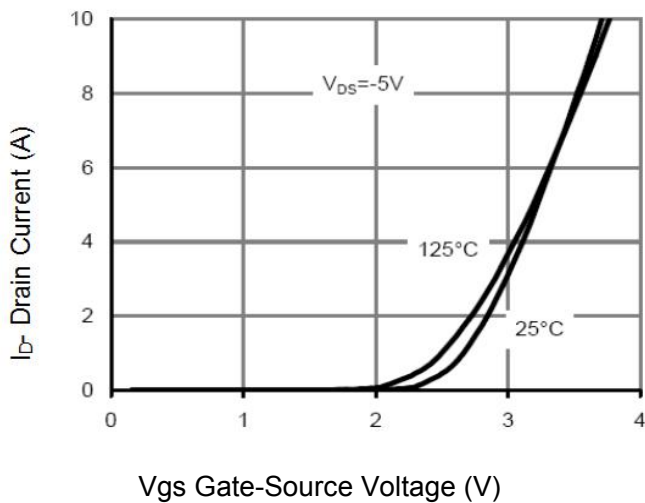


Figure 7 Transfer Characteristics

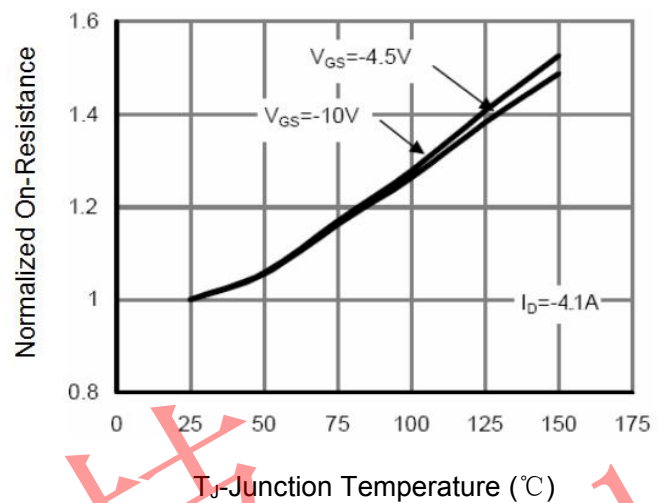


Figure 8 Drain-Source On-Resistance

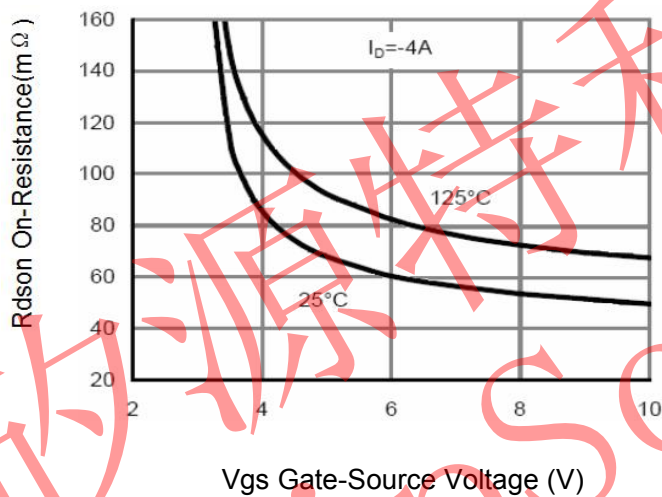


Figure 9 Rdson vs Vgs

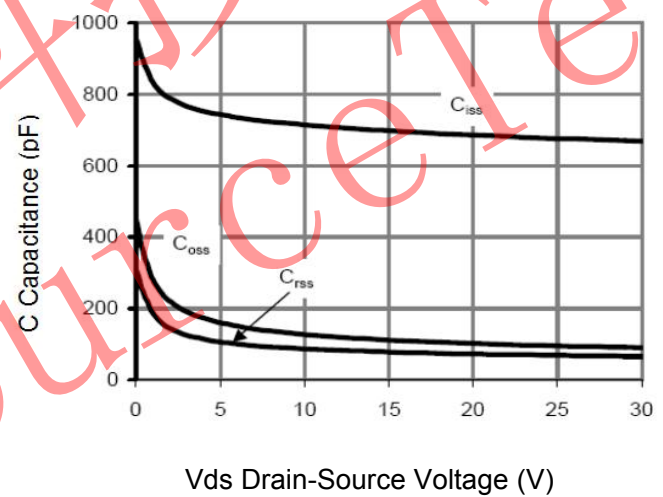


Figure 10 Capacitance vs Vds

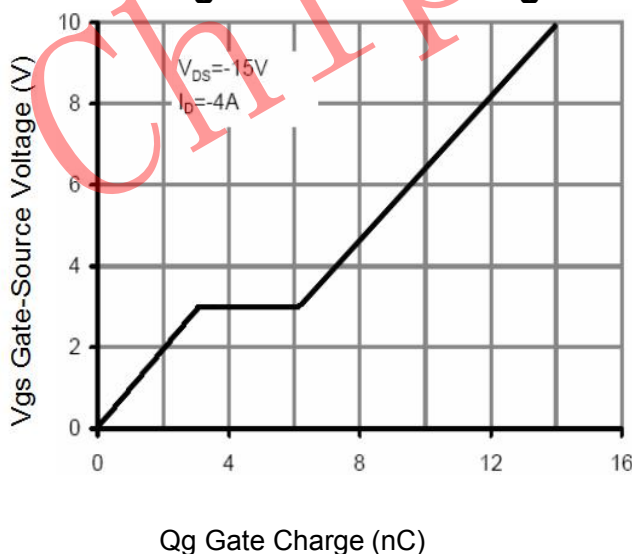


Figure 11 Gate Charge

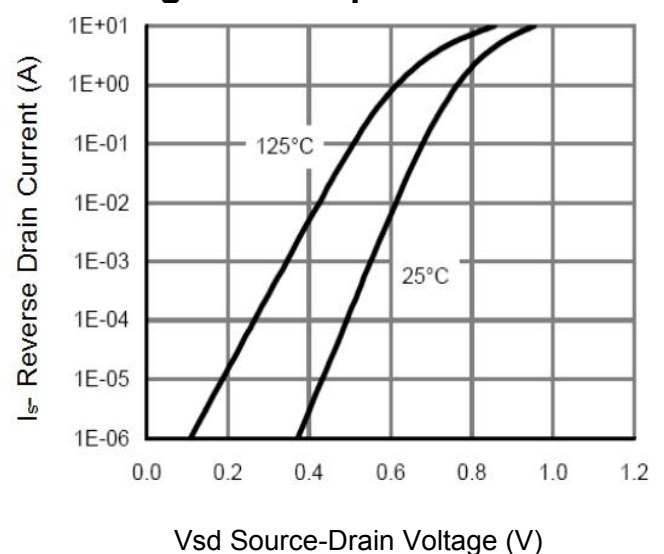


Figure 12 Source-Drain Diode Forward

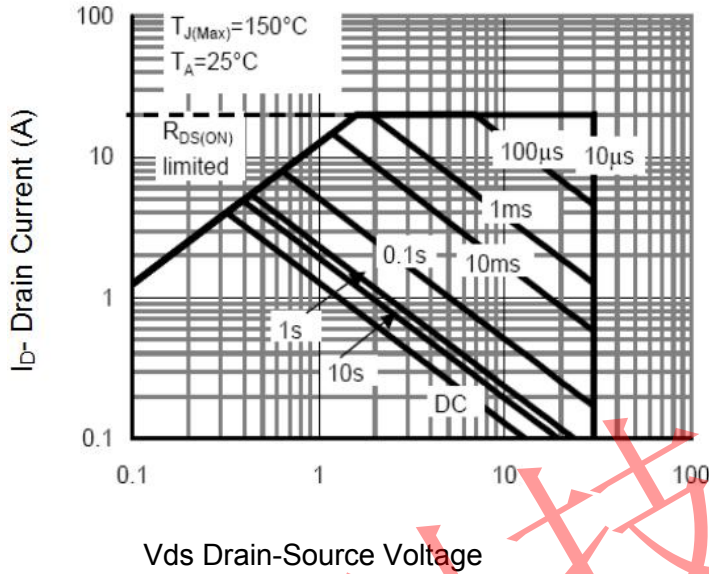


Figure 13 Safe Operation Area

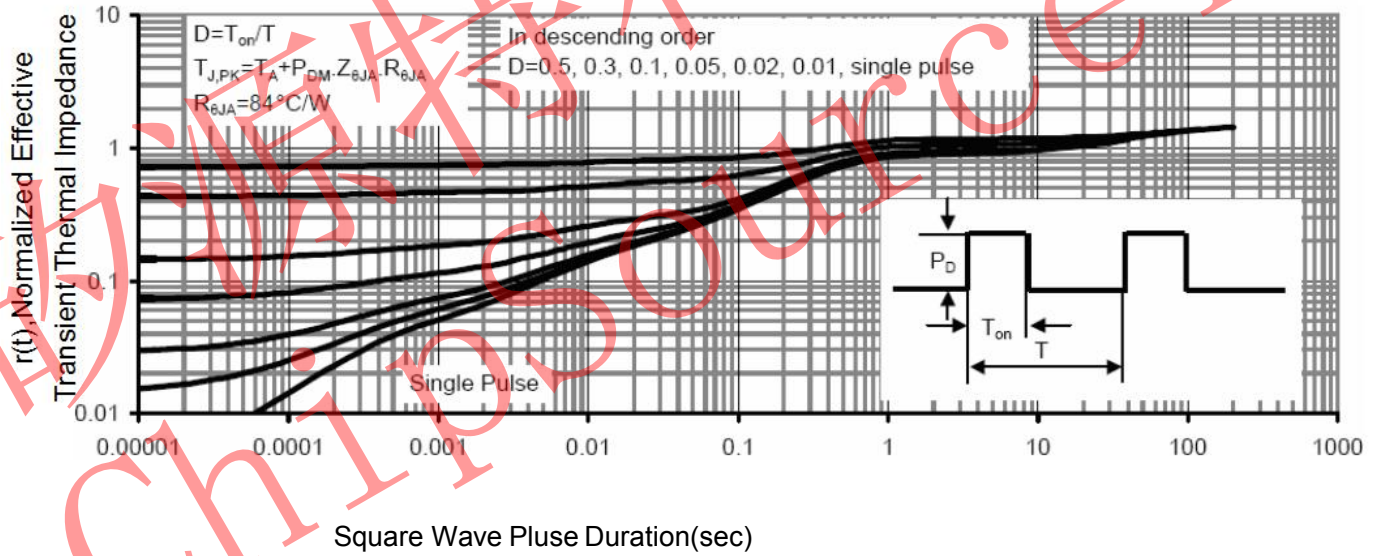
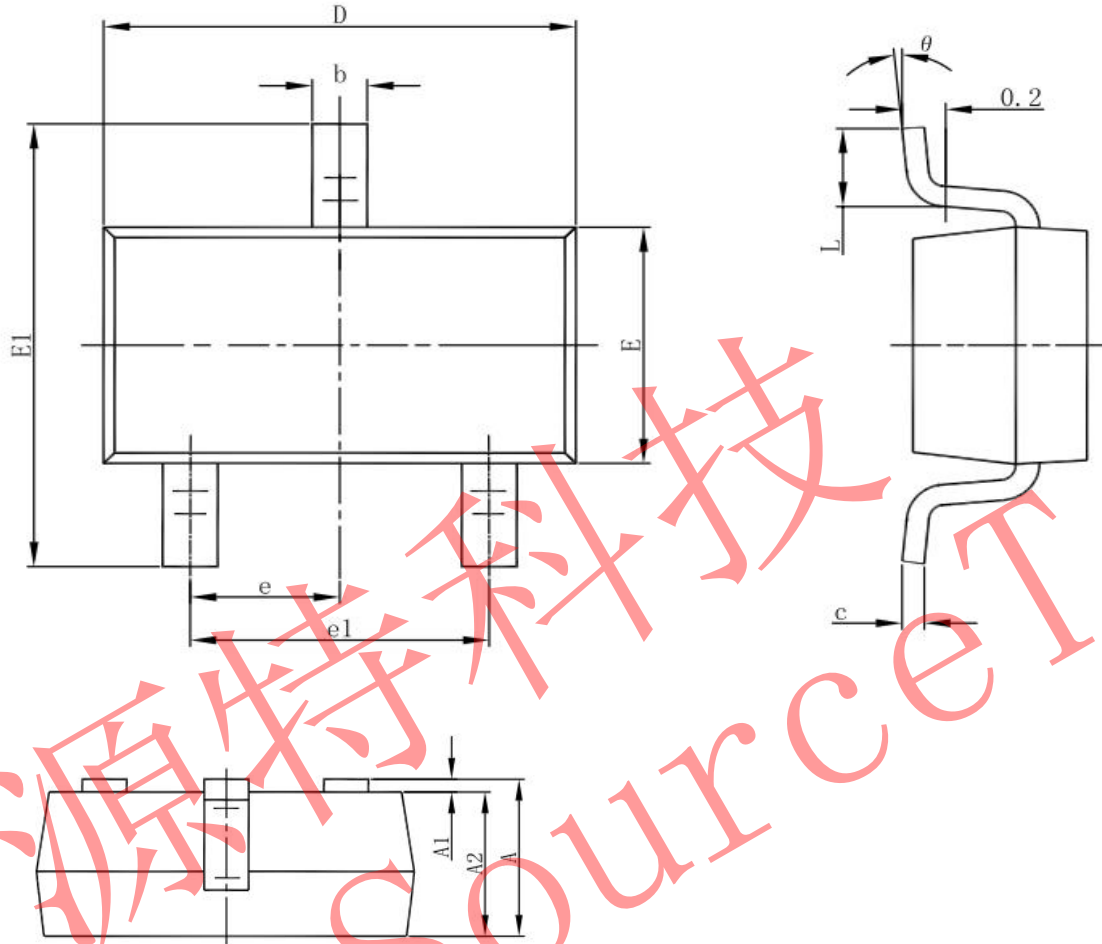


Figure 14 Normalized Maximum Transient Thermal Impedan



### SOT-23 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
$\theta$	0°	8°	0°	8°