

## GS2401C 40V $\mu$ A-power LDO Regulator

### Features

- Maximum Operating Voltage: 40V
- Output Voltage: 1.8V, 2.5V, 3.0V, 3.3V, 3.6V, 4.0V, 4.2V and 5.0V
- Output Accuracy:  $\pm 1\%$
- Low Power Consumption: 1.5 $\mu$ A
- <0.1 $\mu$ A Standby Current When Shutdown
- Low Temperature Coefficient
- Current Limiting, Thermal Shutdown
- Available in TO-92, SOT89-3, SOT23/SOT23-3L, SOT223-3 and SOT23-5 Packages

### Applications

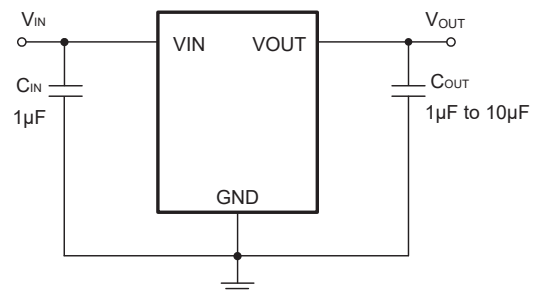
- Battery Supplied Systems
- Telecom Systems
- Audio & Video Devices

### General Description

The GS2401C is a 40V  $\mu$ A-power high accuracy LDO regulator. The 1 $\mu$ A power consumption makes it ideal for most HV power-saving systems. The maximum operating voltage can be as high as 40V. The output accuracy is as excellent as  $\pm 1\%$ .

The other features include low dropout voltage, current limiting protection and thermal shutdown protection.

### Typical Application Circuit

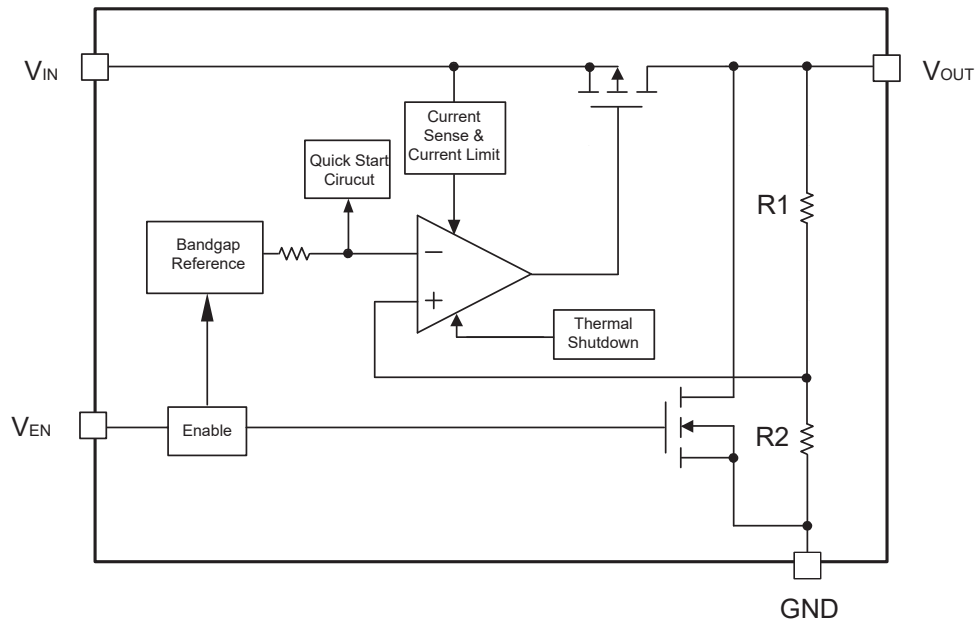


### Order Information

Model	PIN-PACKAGE	Ordering Number	Packing Option
GS2401C	SOT23/SOT23-3L	GS2401C-XXTR3	3000pcs/Reel
	SOT23-5A	GS2401C-XXTR5	3000pcs/Reel
	SOT23-5B	GS2401CY-XXTR5	3000pcs/Reel
	SOT89-3A	GS2401C-XXSTR3	3000pcs/Reel
	SOT89-3B	GS2401CY-XXSTR3	3000pcs/Reel
	TO92	GS2401C-XXOTR2	3000pcs/Reel
	SOT223-3	GS2401C-XXCTR3	3000pcs/Reel

**Note:** "XX" represents the type of voltage value.

### Block Diagram

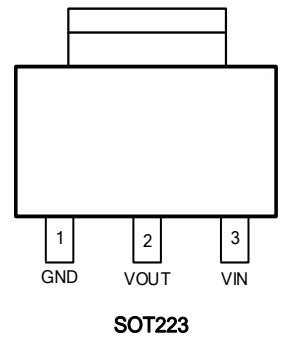
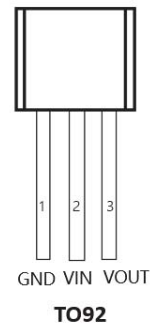
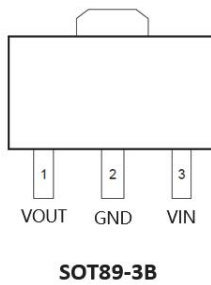
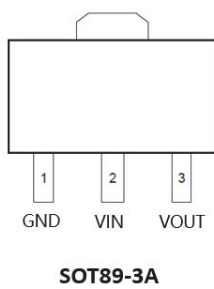
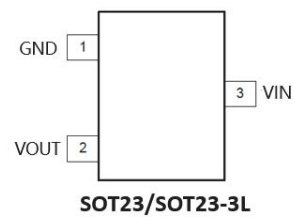
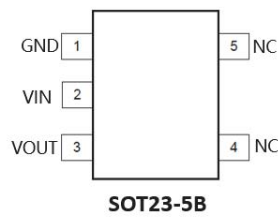
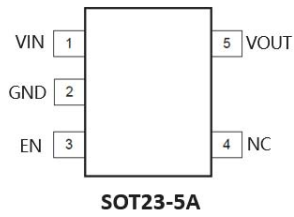


### Absolute Maximum Ratings

SYMBOL	ITEM	RATING	UNIT
V <sub>IN</sub>	Supply Voltage	-0.3~44	V
V <sub>EN</sub>	EN pin to GND Voltage	-0.3~44	V
V <sub>IO</sub>	VOUT pin to GND Voltage	-0.3~6	V
V <sub>IO2</sub>	VOUT pin to VIN Voltage	-46~0.3	V
PD	Maximum Power Dissipation, SOT89-3	1.2	W
	Maximum Power Dissipation, SOT23-3	0.4	W
	Maximum Power Dissipation, SOT223-3	2	W
Package Thermal Resistance	SOT23-3, $\theta_{JA}$	305	°C/W
	SOT89-3, $\theta_{JA}$	75	°C/W
	SOT223-3, $\theta_{JA}$	95	°C/W
T <sub>J</sub>	Junction Temperature Range	-40~150	°C
T <sub>STG</sub>	Storage Temperature Range	-50~150	°C
T <sub>OP</sub>	Operating Temperature Range	-45~125	°C
T <sub>SOLDER</sub>	Lead Temperature (Soldering)	260°C, 10s	

**Note:** Absolute Maximum Ratings are threshold limit values that must not be exceeded even for an instant under any condition. Moreover, such values for any two items must not be reached simultaneously. Operation above these absolute maximum ratings may cause degradation or permanent damage to the device. These are stress ratings only and do not necessarily imply functional operation below these limits.

## Pin Description



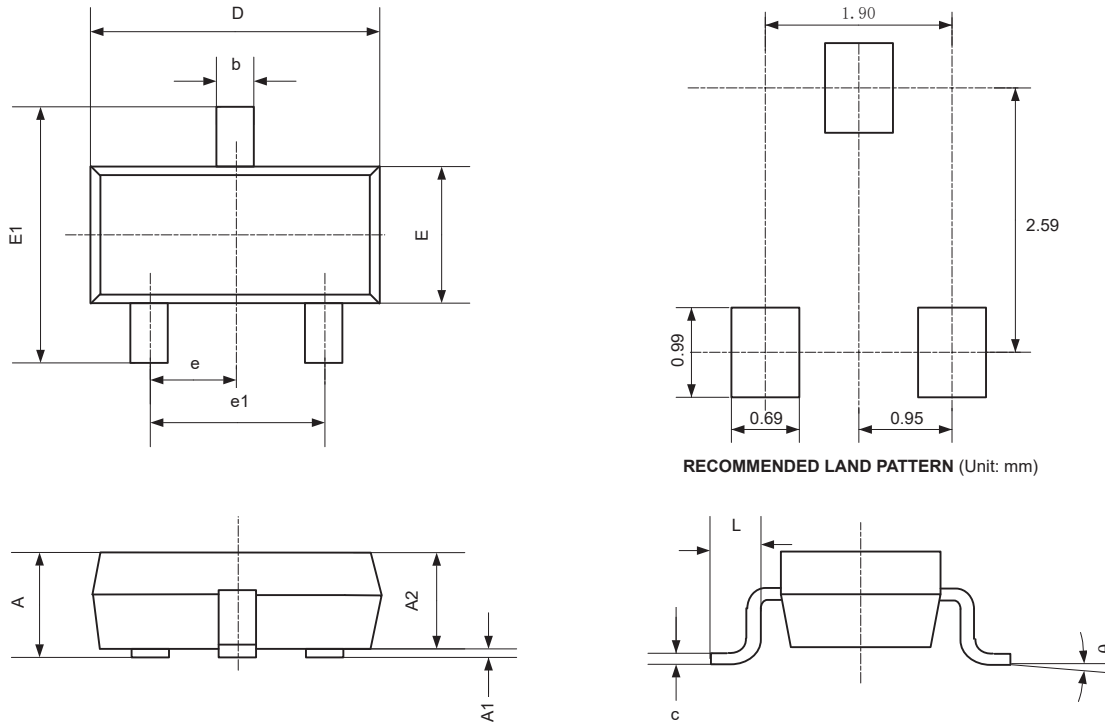
PIN					NAME	FUNCTION
SOT23/ SOT23-3L SOT223	SOT89-3A/ TO92	SOT89-3B	SOT23-5A	SOT23-5B		
1	1	2	2	1	GND	Ground
2	3	1	5	3	VOUT	Output
3	2	3	1	2	VIN	Power Supply Input
			3		EN	Chip Enable
			4	4,5	NC	Not Connected

## Electrical Characteristics

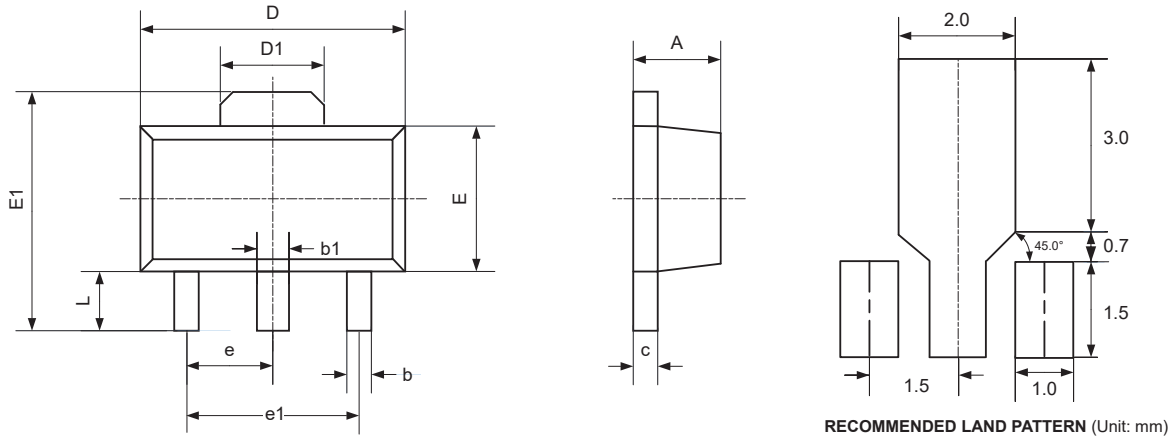
( $V_{IN} = V_{OUT} + 1V$ ,  $C_L = 1\mu F$ ,  $T_A = +25^\circ C$ , unless otherwise noted.)

Parameter	Symbol	Values			Unit	Note/Test Condition
		Min.	Typ.	Max.		
Input Voltage	$V_{IN}$	2.5		40	V	
Output Voltage	$V_{OUT}$	-1%		+1%	V	$I_{OUT}=40mA$
Maxim Output Current	$I_{OUT\_max}$	150			mA	SOT89-3, SOT223-3, TO92
		100			mA	SOT23-3
Load Regulation	$\Delta V_{OUT}$		25	50	mV	$1mA < I_{OUT} < 60mA$
Dropout Voltage	$V_{Drop}$		260		mV	$I_{OUT}=40mA, V_{OUT}=5V$
			700		mV	$I_{OUT}=100mA, V_{OUT}=1.8V$
Quiescent Current	$I_{QC}$		1.3	2	$\mu A$	$V_{IN}=V_{OUT}+1V, I_{OUT}=0mA$
Short Current	$I_{Short}$		70		mA	$V_{OUT}=0V$
Line Regulation	$R_{EGI}$		0.2	0.3	%/V	$V_{IN}=V_{OUT}+1V$ to 24V, $I_{OUT}=40mA$
Power Supply Rejection Ratio	$P_{SRR}$		85		dB	Freq=200Hz, $I_{OUT}=50mA$
			80			Freq=1KHz, $I_{OUT}=50mA$
Temperature Coefficient	$T_C$		$\pm 0.7$		mV/ $^\circ C$	$I_{OUT}=40mA, -40^\circ C \sim +85^\circ C$
Thermal Shutdown	$T_{SD}$		180		$^\circ C$	Shutdown, Temp increasing
Thermal Hysteresis	$T_{HYST}$		20		$^\circ C$	

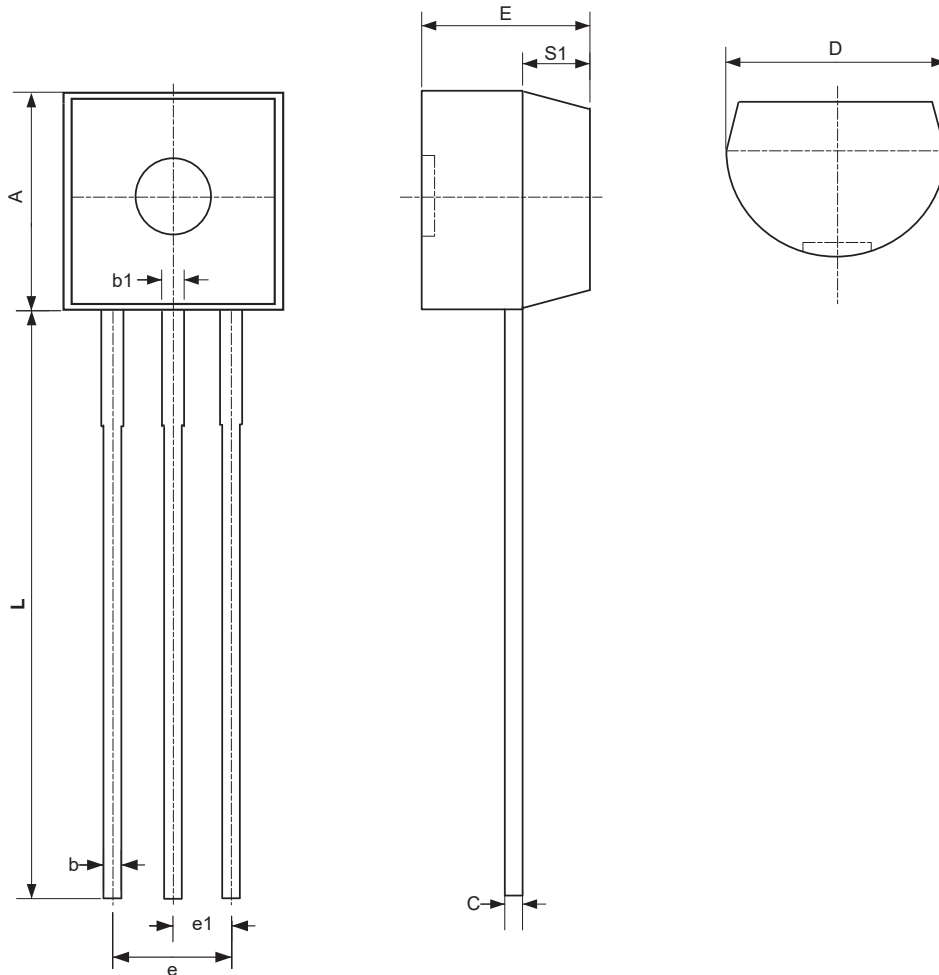
## Package Outline(SOT23)



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	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

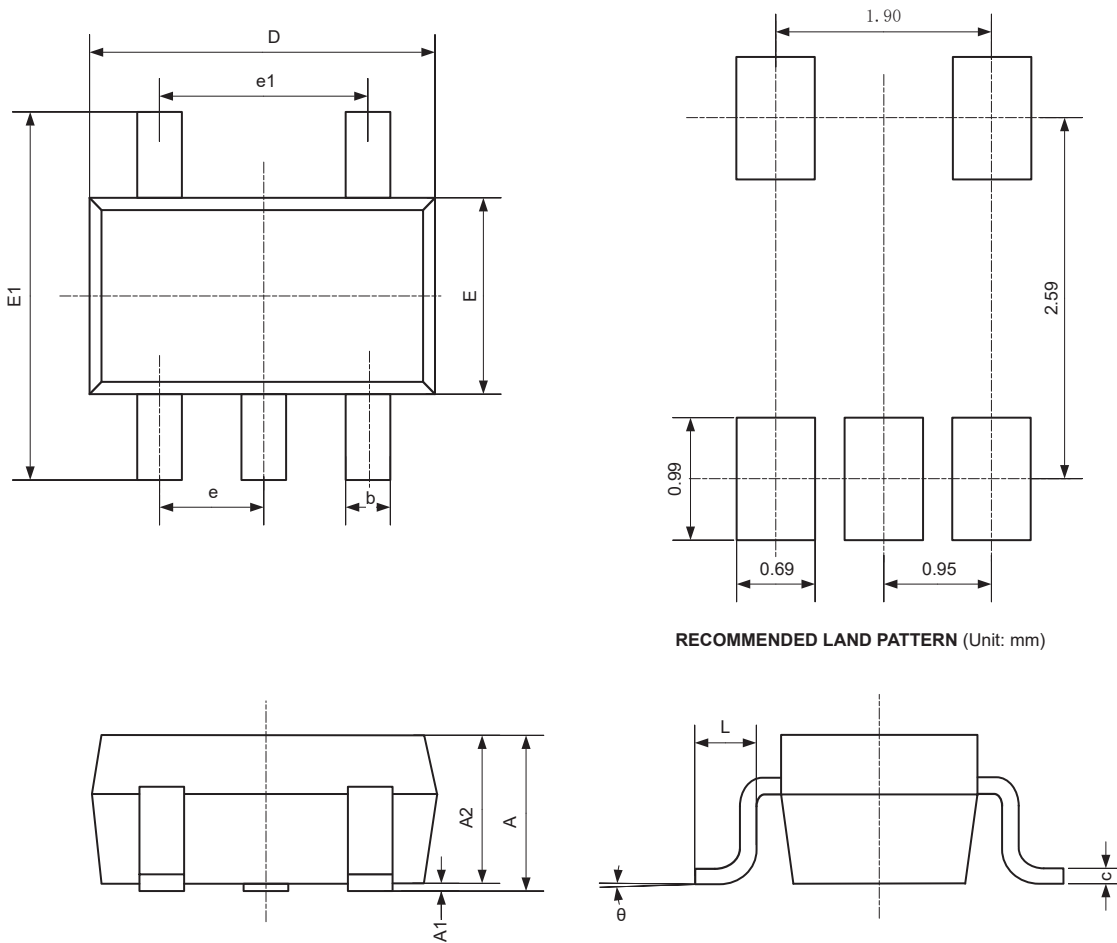
**Package Outline(SOT89-3)**


Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TPY		0.060 TPY	
e1	3.000 TPY		0.118 TPY	
L	0.900	1.200	0.035	0.047

**Package Outline(T092)**


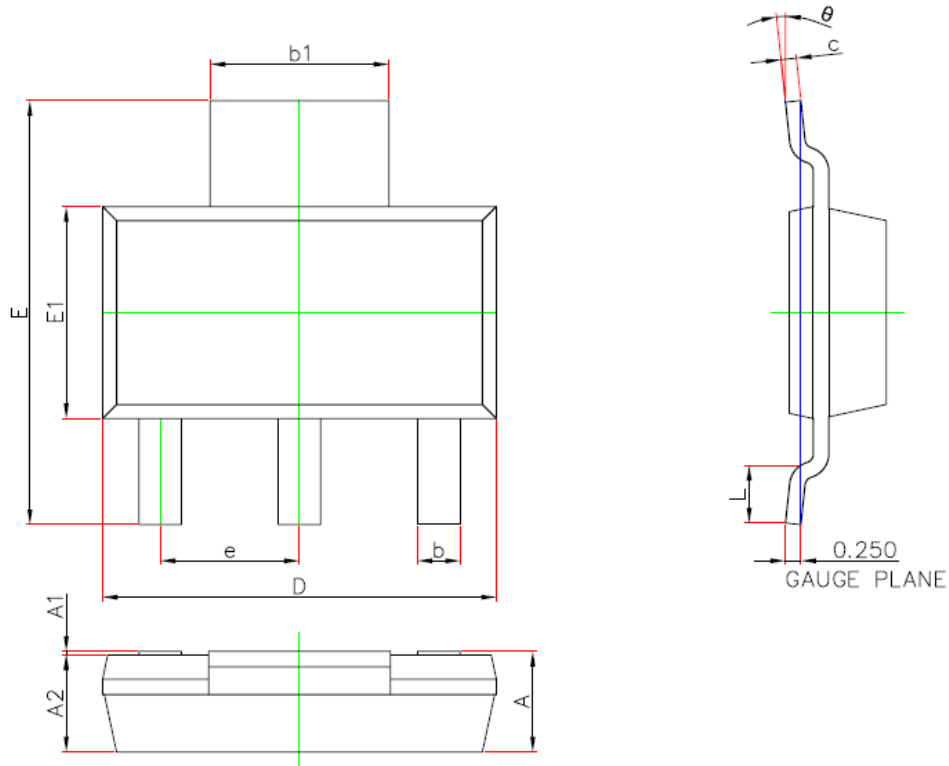
Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	4.450	4.700	0.177	0.185
b	0.360	0.510	0.014	0.020
b1	0.360	0.760	0.016	0.023
c	0.360	0.510	0.016	0.020
D	4.440	4.700	0.175	0.185
E	3.300	3.810	0.130	0.150
L	12.700		0.500	
e1	1.150	1.390	0.045	0.055
e	2.420	2.660	0.095	0.105
S1	1.020		0.040	

## Package Outline(SOT23-5)



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	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°



**Package Outline(SOT223)**


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	—	1.800	—	0.071
A1	0.020	0.100	0.001	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.840	0.026	0.033
b1	2.900	3.100	0.114	0.122
c	0.230	0.350	0.009	0.014
D	6.300	6.700	0.248	0.264
E	6.700	7.300	0.264	0.287
E1	3.300	3.700	0.130	0.146
e	2.300(BSC)		0.091(BSC)	
L	0.750	—	0.030	—
θ	0°	10°	0°	10°