AOS SEMICONDUCTOR

产品规格说明书

Product Data Sheet

AOS805xx

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100kHz, 670nA, Non-Unity Gain,Rail-to-Rail I/O CMOS Operational Amplifier

DESCRIPTIONS

The AOS8051, AOS8052, AOS8054, families of products offer low voltage operation and rail-to-rail input and output, as well as excellent speed/power consumption ratio, providing an excellent bandwidth (100kHz) and slew rate of 30V/ms. The op-amps arestable for gains ⩾ 10 and feature an ultra-low input bias current.

The devices are ideal for sensor interfaces, active filters and portable applications. The AOS8051, AOS8052, AOS8054 families of operational amplifiers are specified at the full temperature range of −40℃ to +125℃ under single or dual power supplies of 1.4V to 5.5V.

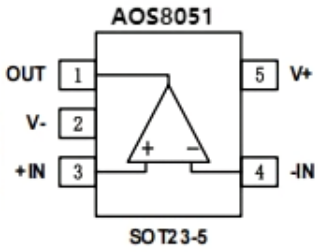
FEATURES

★ GAIN BANDWIDTH:100kHz
★ RAIL-TO-RAIL INPUT AND OUTPUT 1mV Typical Vos
★ INPUT VOLTAGE RANGE: -0.1V to +5.6V with Vs = 5.5V
★ SUPPLY RANGE: +1.4V to +5.5V
★ STABLE FOR GAINS ⩾ 10
★ SPECIFIED UP TO +125℃
★ Micro SIZE PACKAGES: SOT23-5

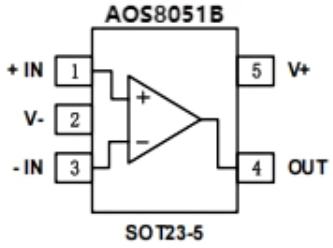
APPLICATIONS

★ SENSORS
★ PHOTODIODE AMPLIFICATIONWEARABLE
★ WEARABLE PRODUCTS
★ TEMPERATURE MEASUREMENT
★ BATTERY POWERED SYSTEM

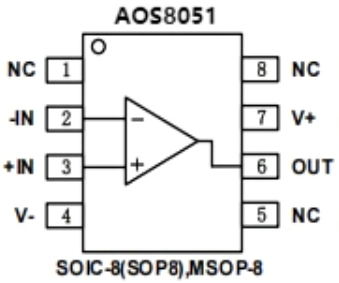
PIN CONFIGURATIONS



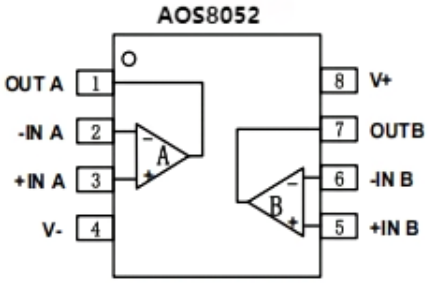
SOT23-5



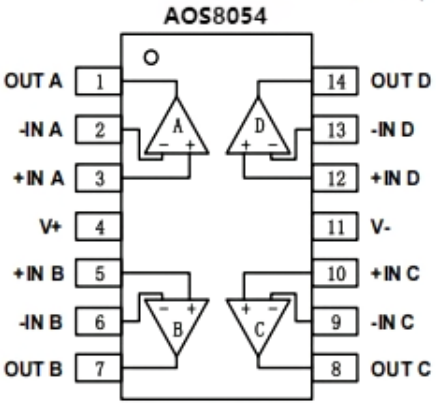
SOT23-5



SOIC-8(SOP8),MSOP-8



SOIC-8(SOP8),MSOP-8,
TDFN2x2-8



SOIC-14(SOP14),TSSOP-14

Note: NC indicates no internal connection

ABSOLUTE MAXIMUM RATINGS (1)

Supply Voltage, V+ to V-	7.0V
Input Terminals, Voltage (2)	– 0.5 to (V+) + 0.5V
Current (2)	±10mA
Storage Temperature	−65°C to +150°C
Operating Temperature	−40°C to +125°C
Junction Temperature	150°C
Package Thermal Resistance @ T_A = +25°C	
SOT23-5, SOT23-6	200°C/W
MSOP-10, SOIC-8	150°C/W
SOIC-14, TSSOP-14	100°C/W
Lead Temperature (Soldering, 10s)	260°C
ESD Susceptibility	
HBM	5000V
MM	400V

(1) Stresses above these ratings may cause permanent damage. Exposure to absolute maximum conditions for extended periods may degrade device reliability. These are stress ratings only , and functional operation of the device at these or any other conditions beyond those specified is not implied.
(2) Input terminals are diode-clamped to the power-supply rails. Input signals that can swing more than 0.5V beyond the supply rails should be current-limited to 10mA or less.

ESD SENSITIVITY CAUTION

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

PACKAGE/ORDERING INFORMATION

PRODUCT	ORDERING NUMBER	TEMPERATURE RANGE	PACKAGE LEAD	PACKAGE MARKING	PACKAGE OPTION
AOS8051	AOS8051XK	-40°C~125°C	SOIC-8(SOP8)	AOS8051	Tape andReel,2500
	AOS8051XF	-40°C~125°C	SOT23-5	8051	Tape andReel,3000
	AOS8051BXF	-40°C~125°C	SOT23-5	8051B	Tape andReel,3000
	AOS8051XM	-40°C~125°C	MSOP-8	AOS8051	Tape andReel,3000
AOS8052	AOS8052XK	-40°C~125°C	SOIC-8(SOP8)	AOS8052	Tape andReel,2500
	AOS8052XM	-40°C~125°C	MSOP-8	AOS8052	Tape andReel,3000
	AOS8052XTDE8	-40°C~125°C	TDFN2x2-8	AOS8052	Tape andReel,3000
AOS8054	AOS8054XP	-40°C~125°C	SOIC-14(SOP14)	AOS8054	Tape andReel,2500
	AOS8054XQ	-40°C~125°C	TSSOP-14	AOS8054	Tape andReel,3000

ELECTRICAL CHARACTERISTICS

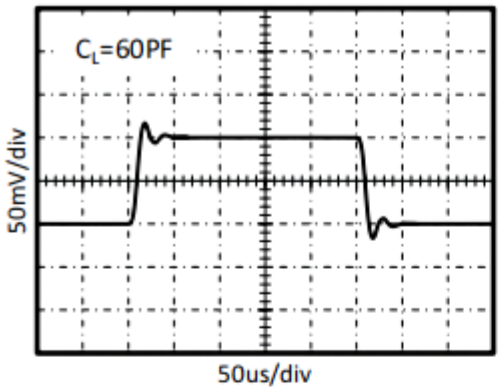
(At T_A= +25℃, V_S=5.0V, R_L= 1MΩ connected to V_S/2, and V_{OUT}= V_S/2, unless otherwise noted.)

PARAMETER		CONDITIONS	AOS8051,AOS8052, AOS8054			UINTS
			MIN	TYP	MAX	
POWER SUPPLY						
Vs	Operating Voltage Range		1.4		5.5	V
IQ	Quiescent Current/ Amplifier			670	1500	nA
PSRR	Power-Supply Rejection Ratio	Vs=1.4V to 5.5V, Vcm=(V-)+0.5V	60	70		dB
INPUT						
Vos	Input Offset Voltage	Vcm=Vs/2		1	5	mV
ΔVos/ΔT	Input Offset Voltage Drift	Vcm=Vs/2, -40°C≤T_A≤125°C		2.3		μV/°C
IB	Input Bias Current			1	10	pA
Ios	Input Offset Current			1	10	pA
Vcm	Common-Mode Voltage Range	Vs= 5.5V	-0.1		5.6	V
CMRR	Common-Mode Rejection Ratio	Vs= 5.5V, Vcm=-0.1V to 4V	63	75		dB
		Vs= 5.5V, Vcm=-0.1V to 5.6V	58	70		dB
OUTPUT						
AOL	Open-Loop Voltage Gain	Vs=1.4V,R_L=50KΩ, Vo=Vs-0.1V	62	80		dB
		Vs=5.0V,R_L=50kΩ, Vo=Vs-0.1V	65	85		dB
	Output Swing From Rail	R_L=50KΩ		5		mV
Iout	Output Short-Circuit Current			30		mA
FREQUENCY RESPONSE						
SR	Slew Rate			30		V/ms
GBP	Gain-Bandwidth Product			100		kHz
PM	Phase Margin			60		°
NOISE						
enp-p	Input Voltage Noise	f = 0.1 Hz to 10 Hz		2.4		μVpp
en	Input Voltage Noise Density	f = 1 kHz		160		nV/√Hz

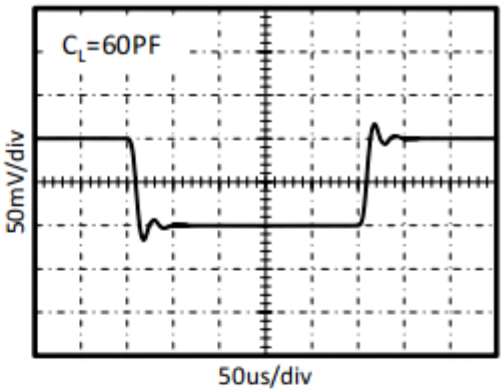
TYPICAL CHARACTERISTICS

At T_A= +25℃, Vs=5V, R_L= 1MΩ connected to V_S/2,C_L=60pF, V_{CM}= V_S/2, unless otherwise noted.

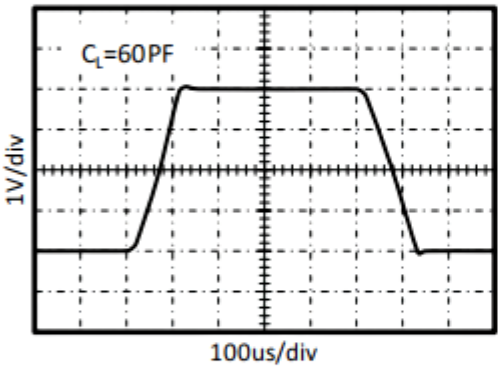
SMALL-SIGNAL STEP RESPONSE



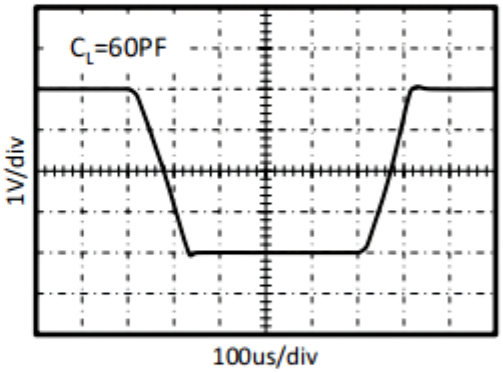
SMALL-SIGNAL STEP RESPONSE



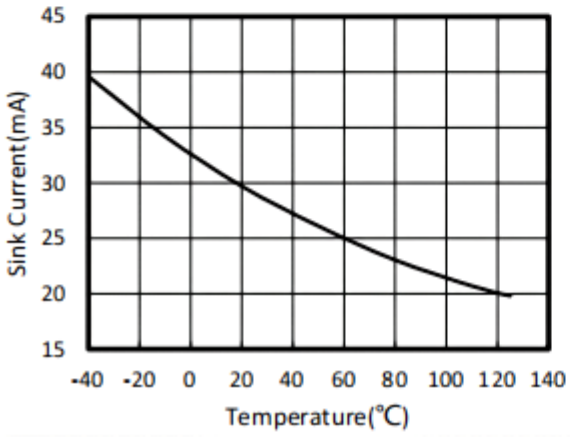
LARGE-SIGNAL STEP RESPONSE



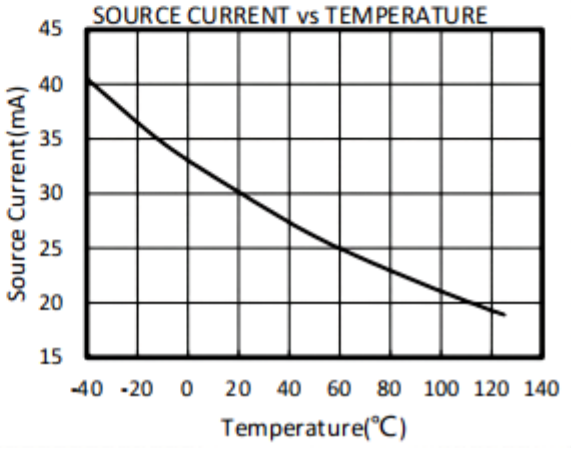
LARGE-SIGNAL STEP RESPONSE



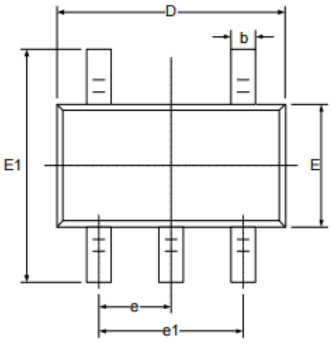
SINK CURRENT vs TEMPERATURE

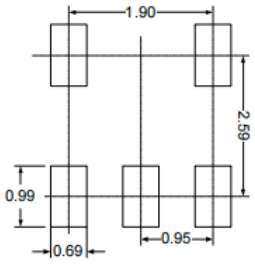


SOURCE CURRENT vs TEMPERATURE

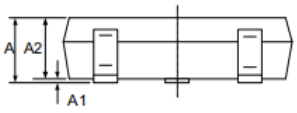


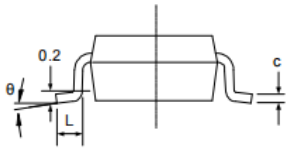
PACKAGE OUTLINE DIMENSIONS
SOT23-5





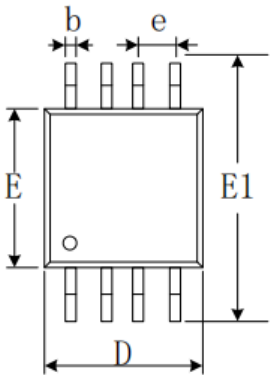
RECOMMENDED LAND PATTERN (Unit: mm)

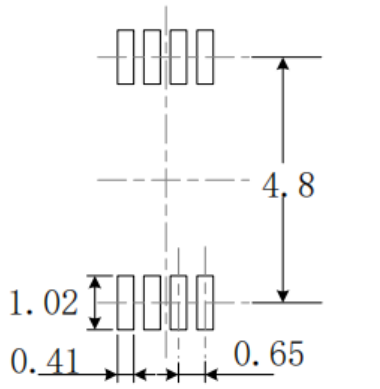




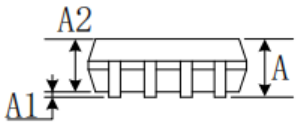
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)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

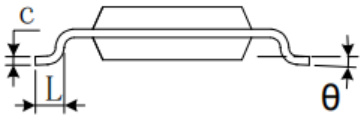
MSOP-8





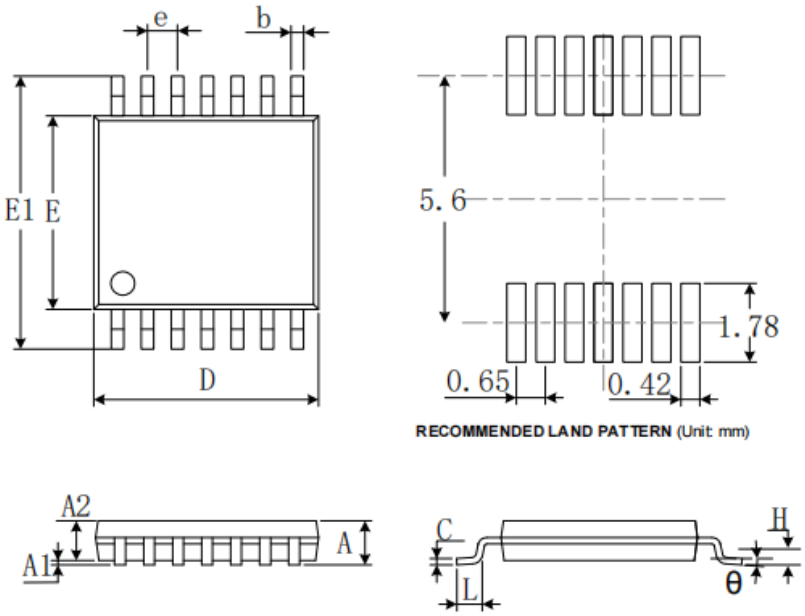
RECOMMENDED LAND PATTERN (Unit: mm)





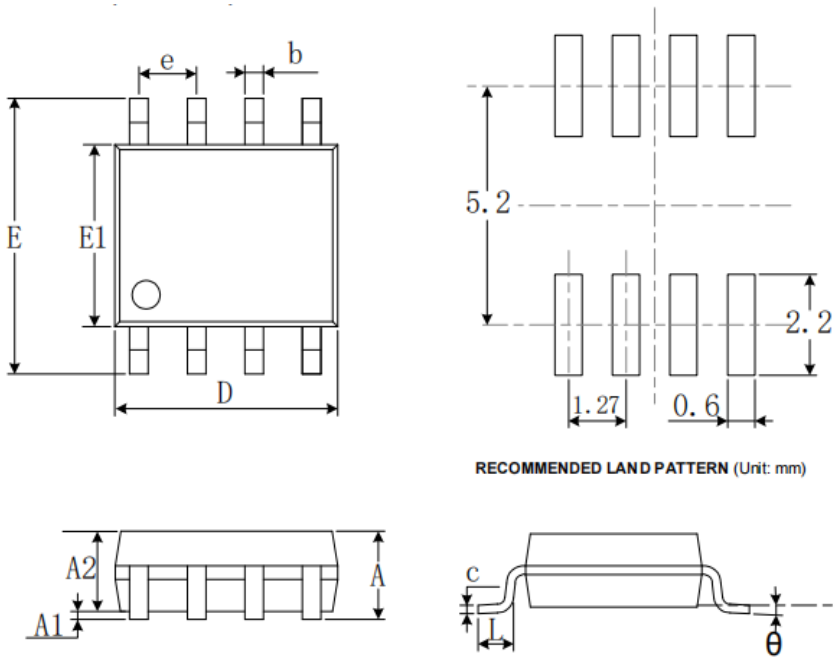
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.820	1.100	0.032	0.043
A1	0.020	0.150	0.001	0.006
A2	0.750	0.950	0.030	0.037
b	0.250	0.380	0.010	0.015
c	0.090	0.230	0.004	0.009
D	2.900	3.100	0.114	0.122
e	0.650(BSC)		0.026(BSC)	
E	2.900	3.100	0.114	0.122
E1	4.750	5.050	0.187	0.199
L	0.400	0.800	0.016	0.031
θ	0 °	6 °	0 °	6 °

TSSOP-14



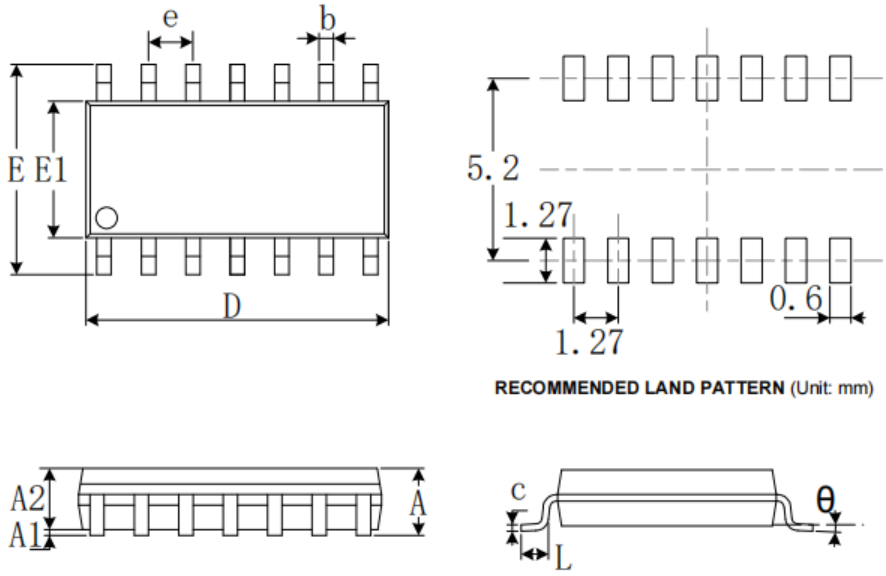
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A		1.200		0.047
A1	0.050	0.150	0.002	0.006
A2	0.800	1.050	0.031	0.041
b	0.190	0.300	0.007	0.012
c	0.090	0.200	0.004	0.008
D	4.860	5.100	0.191	0.201
E	4.300	4.500	0.169	0.177
E1	6.250	6.550	0.246	0.258
e	0.650(BSC)		0.026(BSC)	
L	0.500	0.700	0.020	0.028
H	0.25(TYP)		0.01(TYP)	
θ	1°	7°	1°	7°

SOIC-8(SOP8)



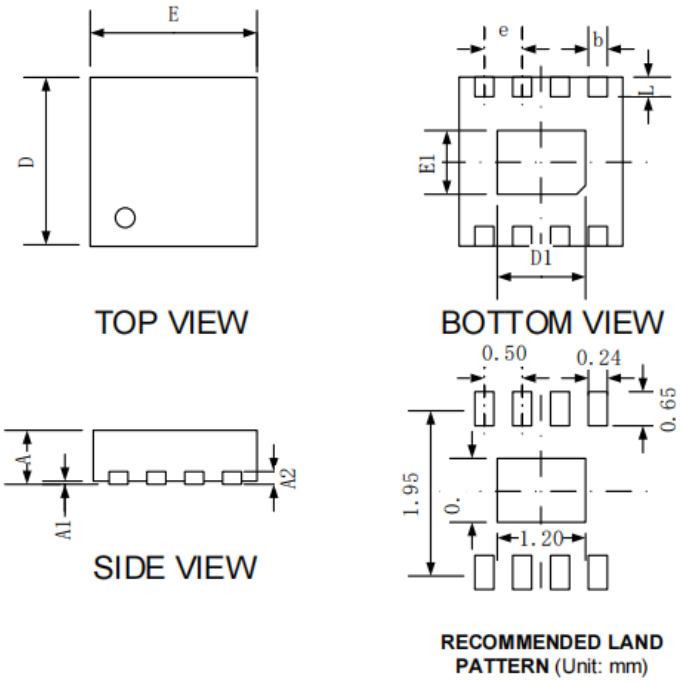
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270(BSC)		0.050(BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0 °	8 °	0 °	8 °

SOIC-14(SOP14)



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	0.310	0.510	0.012	0.020
c	0.100	0.250	0.004	0.010
D	8.450	8.850	0.333	0.348
e	1.270(BSC)		0.050(BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0 °	8 °	0 °	8 °

TDFN-2x2-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A2	0.203(TYP)		0.008(TYP)	
b	0.180	0.300	0.007	0.012
D	1.900	2.100	0.075	0.083
D1	1.100	1.300	0.043	0.051
E	1.900	2.100	0.075	0.083
E1	0.600	0.800	0.024	0.031
e	0.500(TYP)		0.020(TYP)	
L	0.250	0.450	0.010	0.018