30-V INPUT CURRENT MODE BOOST CONTROLLER

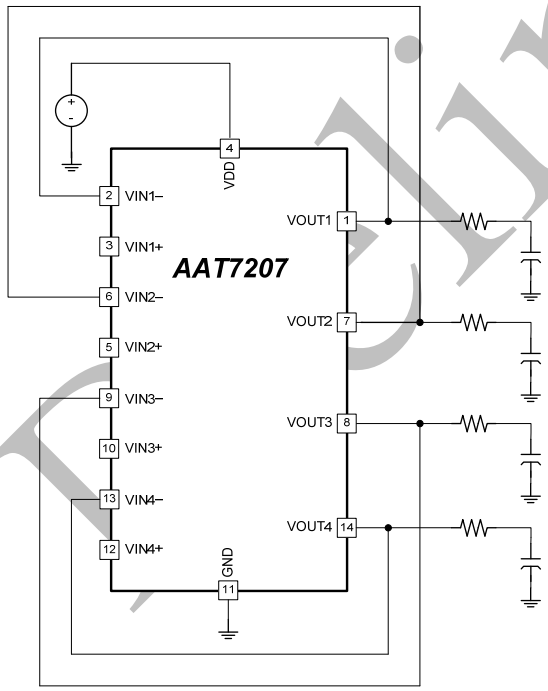
FEATURES

- **4-Channels Rail-to-Rail VCOM/ Gamma Buffer**
- **Peak Output Current of ±600mA(MAX);**
- **30MHz -3dB Bandwidth**
- **High Slew Rate: 50V/μS**
- **V_{DD} Specified for 4.5V to 18V**
- **Thermal Fault Protection**
- **Low Supply Current Per Channel: 1.2mA**
- **TSSOP-14 (Power Pad) Package / WQFN16 4x4x0.75 Package**

APPLICATIONS

- **TFT-LCD Panels**

TYPICAL APPLICATION

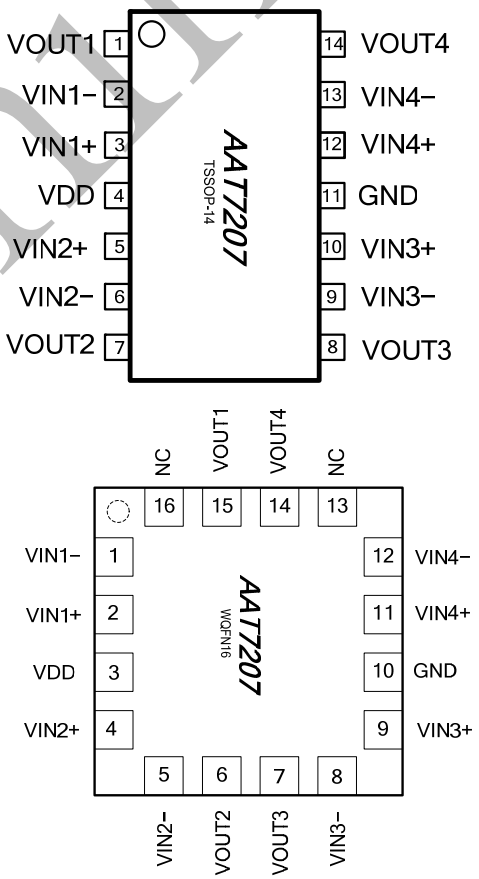


GENERAL DESCRIPTION

The AAT7207 is rail-to-rail buffer amplifier, designed for thin film transistor liquid crystal display (TFT LCD). The AAT7207 has high slew rate, over 600mA peak drive current to driving heavy capacitive loads and providing fast load current.

AAT7207 comes in a compact TQFN-16 package, which makes it an ideal component for space-sensitive designs of LCD monitors and LCD TVs.

PIN CONFIGURATION



ORDERING INFORMATION

DEVICE TYPE	PART NUMBER	PACKAGE	PACKING	TEMPRANGE	MARKING	MARKING DESCRIPTION
AAT7207	AAT7207-T 12-T	T12:TSSOP14 (Power Pad)	T: Tape and Reel	–40°C to +85°C	AAT7207 XXXXXX	Device Type Lot no. (6~9 Digits)
AAT7207	AAT7207-Q 24-T	Q24 : WQFN16-4X4	T: Tape and Reel	–40°C to +85°C	AAT7207 XXXXX XXXX	Device Type Lot no. (6~9 Digits) Date Code (4 Digits)

Note: All AAT products are lead free and halogen free.

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNIT
Power Supply Voltage (VDD Pin)	V_{IN}	+20	V
Input Voltage	V_{INX}	+20	V
MAX Continuous Output Current	$I_{CON.}$	85	mA
Junction Temperature	T_J	+150	°C
Operating Temperature Range	T_C	–40 to +85	°C
Storage Temperature Range	$T_{STORAGE}$	–65 to +150	°C
ESD Susceptibility Human Body Mode		2k	V
ESD Susceptibility Machine Mode		200	V

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	MAX	UNIT
Operating Ambient Temperature	T_C	–40	+85	°C
Power Supply Voltage (VIN)	V_{IN}	8	18	V

ELECTRICAL CHARACTERISTICS

(VDD = 18V, T_C = 25°C , with R_L = 10kΩ and CL = 10pF, unless Otherwise Specified.)

Input Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Input Offset Voltage	V_{OS}	V_{CM} = 10V	-	±2	15	mV
Input Bias Current	I_B	V_{CM} = 10V	-	2	50	nA
Input Impedance	R_{IN}		-	1	-	GΩ
Input Capacitance	C_{IN}		-	1.5	-	pF
Common-Mode Input Range	C_{MIR}		–0.5	-	+18.5	V
Common-Mode Rejection Ratio	C_{MRR}		50	70	-	dB
Open-Loop Gain	A_{VOL}		60	70	-	dB

Output Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Output Swing Low	V_{OL}	I_L = −5mA	-	100	150	mV
Output Swing High	V_{OH}	I_L = +5mA	17.85	17.90	-	V
Peak Output Current	I_{OUT}		-	±600	-	mA

Power Supply Performance

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Power Supply Rejection Ratio	P_{SRR}	+6V < VS+ < +18V	54	80	-	dB
Supply Current (Per Amplifier)	I_S	No Load	-	1.2	-	mA

ELECTRICAL CHARACTERISTICS

(VDD = 18V, T_C = 25°C , with R_L = 10kΩ and CL = 10pF, unless Otherwise Specified.)

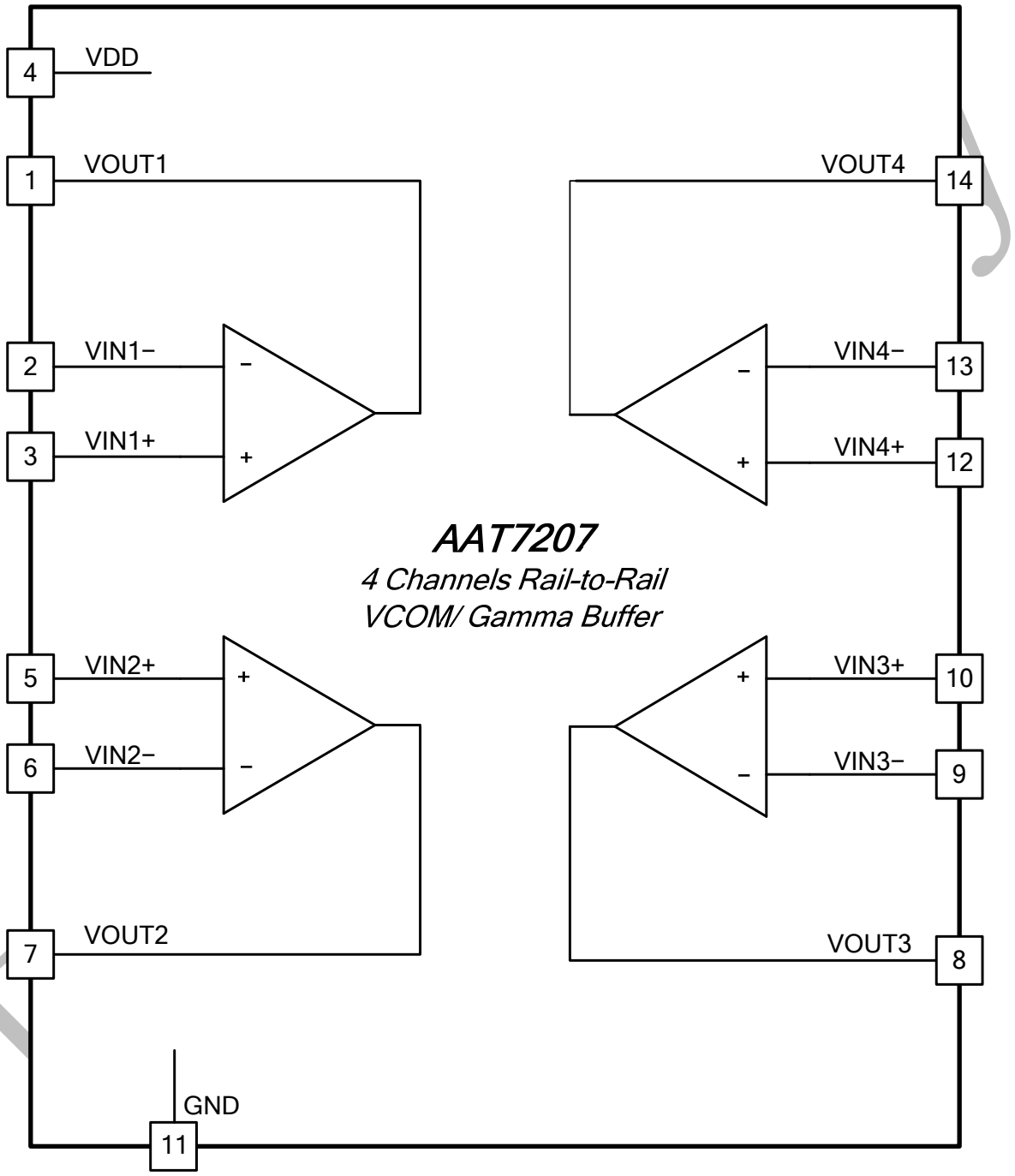
Dynamic Performance

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Slew Rate	S_R	+0.5V < V_{OUT} < 19.5V; 20% to 80%	-	50	-	V/μS
Setting to ±0.1%	ts		-	200	-	nS
–3dB Bandwidth	B_W	No Load	-	30	-	MHz
Gain-Bandwidth Product	B_{GWP}	No Load	-	24	-	MHz
Phase Margin	P_M	No Load	-	50	-	◦
Thermal Shutdown	T_{SD}		-	150	-	°C

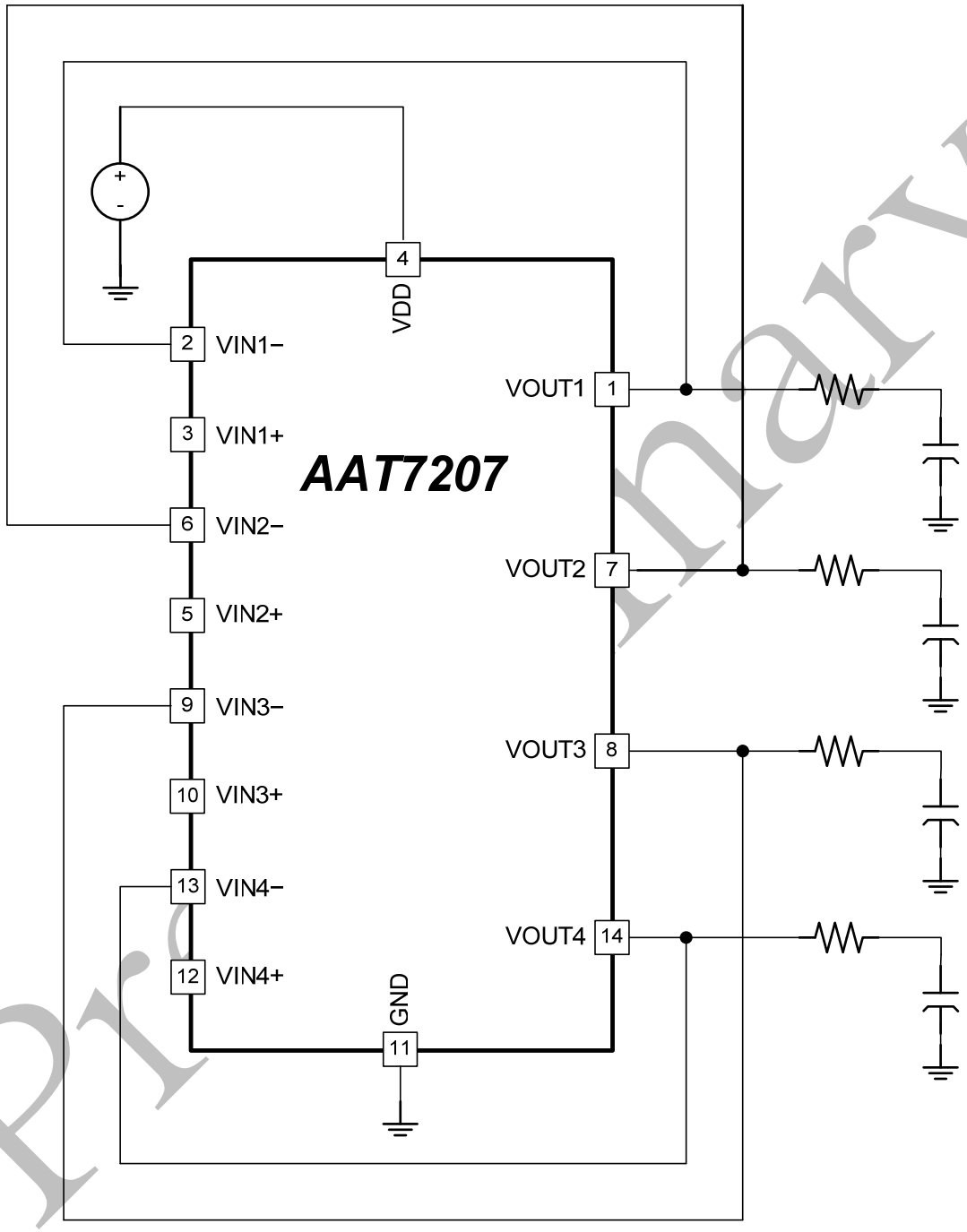
PIN DESCRIPTION

PIN	NAME	I/O	FUNCTION
1	VOUT1	I	Output of the Amplifier-1
2	VIN1−	I	Inverted input pin of the Amplifier-1
3	VIN1+	I	Non-inverted input pin of the Amplifier-1
4	VDD	I	Positive Power Supply
5	VIN2+	O	Non-inverted input pin of the Amplifier-2
6	VIN2−	I	Inverted input pin of the Amplifier-2
7	VOUT2	I	Output of the Amplifier-2
8	VOUT3	O	Output of the Amplifier-3
9	VIN3−	I	Inverted input pin of the Amplifier-3
10	VIN3+	O	Non-inverted input pin of the Amplifier-3
11	GND	O	Ground Pin
12	VIN4+	I	Non-inverted input pin of the Amplifier-4
13	VIN4−	I	Inverted input pin of the Amplifier-4
14	VOUT4	I	Output of the Amplifier-4

FUNCTION BLOCK DIAGRAM

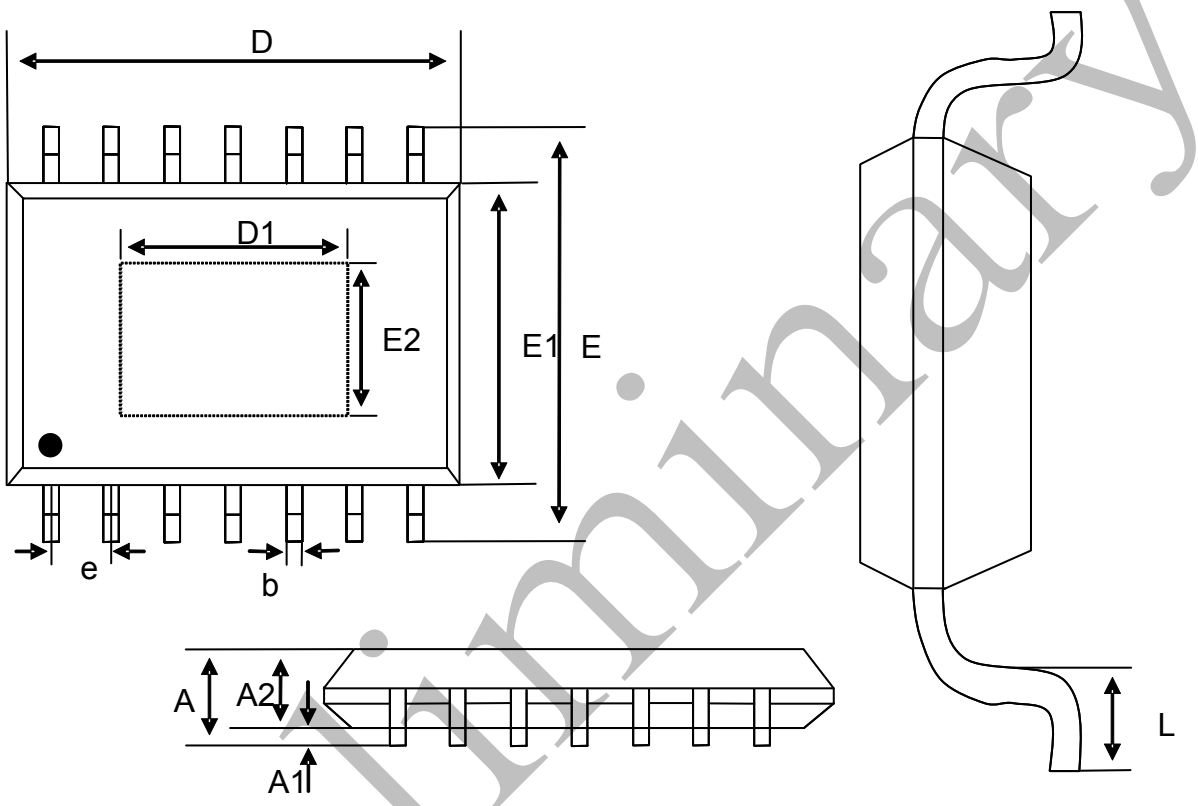


TYPICAL APPLICATION CIRCUIT



PACKAGE DIMENSION

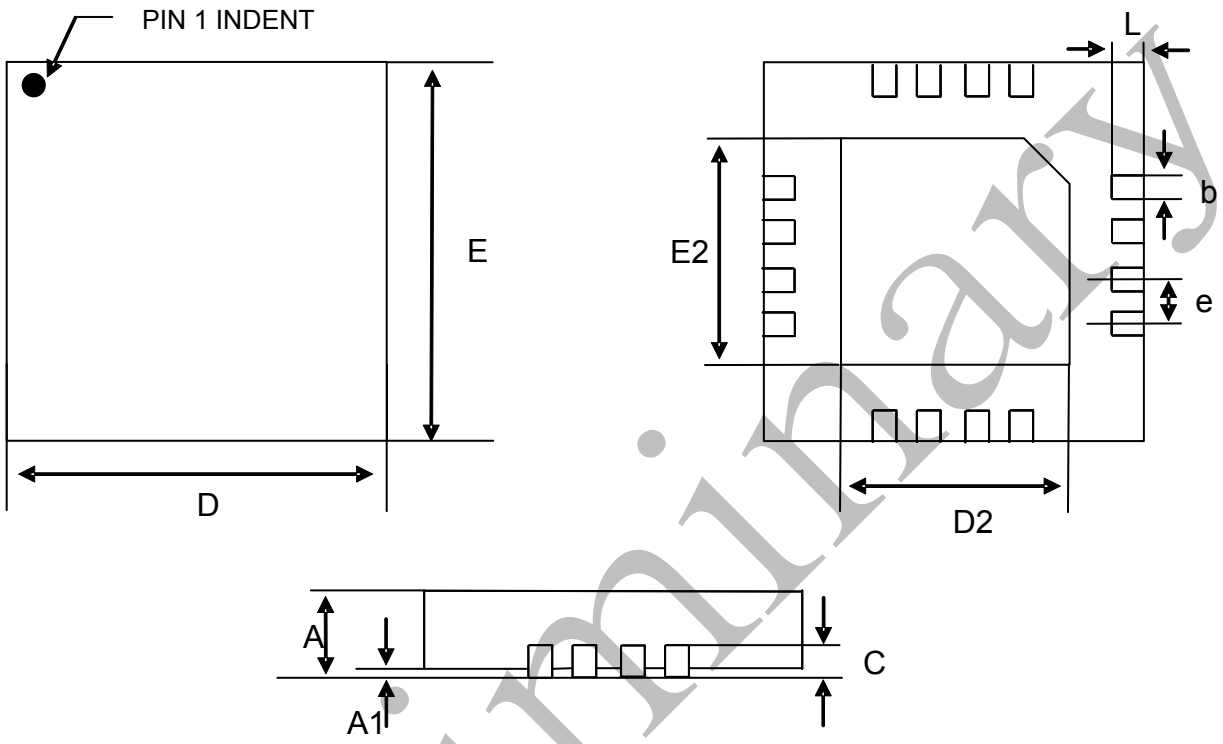
TSSOP14 (Power Pad)



Symbol	Dimensions In Millimeters		
	MIN	TYP	MAX
A	1.00	-----	1.20
A1	0.05	-----	0.15
A2	0.80	1.00	1.05
b	0.19	-----	0.30
D	4.90	5.00	5.10
E	6.20	6.40	6.60
E1	4.30	4.40	4.50
e	-----	0.65	-----
L	0.50	0.60	0.75
D1	2.64	-----	3.10
E2	2.55	-----	3.00

PACKAGE DIMENSION

WQFN16-4X4



Symbol	Dimensions In Millimeters		
	MIN	TYP	MAX
A	0.70	0.75	0.80
A1	0	0.02	0.05
b	0.25	0.30	0.35
C	-----	0.20	-----
D	3.90	4.00	4.10
D2	2.60	2.65	2.70
E	3.90	4.00	4.10
E2	2.60	2.65	2.70
e	-----	0.65	-----
L	0.35	0.40	0.45