



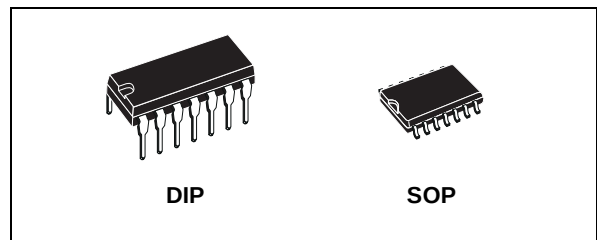
HCF4086B

EXPANDABLE 4-WIDE 2-INPUT AND-OR INVERTER GATE

- MEDIUM-SPEED OPERATION
 $t_{PHL} = 90\text{ns}$, $t_{PLH} = 140\text{ns}$ (Typ.) at 10V
- INHIBIT AND ENABLE INPUTS
- QUIESCENT CURRENT SPECIFIED UP TO 20V
- STANDARDIZED SYMMETRICAL OUTPUT CHARACTERISTICS
- 5V, 10V AND 15V PARAMETRIC RATINGS
- INPUT LEAKAGE CURRENT
 $I_I = 100\text{nA}$ (MAX) AT $V_{DD} = 18\text{V}$ $T_A = 25^\circ\text{C}$
- 100% TESTED FOR QUIESCENT CURRENT
- MEETS ALL REQUIREMENTS OF JEDEC JESD13B "STANDARD SPECIFICATIONS FOR DESCRIPTION OF B SERIES CMOS DEVICES"

DESCRIPTION

HCF4086B is a monolithic integrated circuit fabricated in Metal Oxide Semiconductor technology available in DIP and SOP packages.

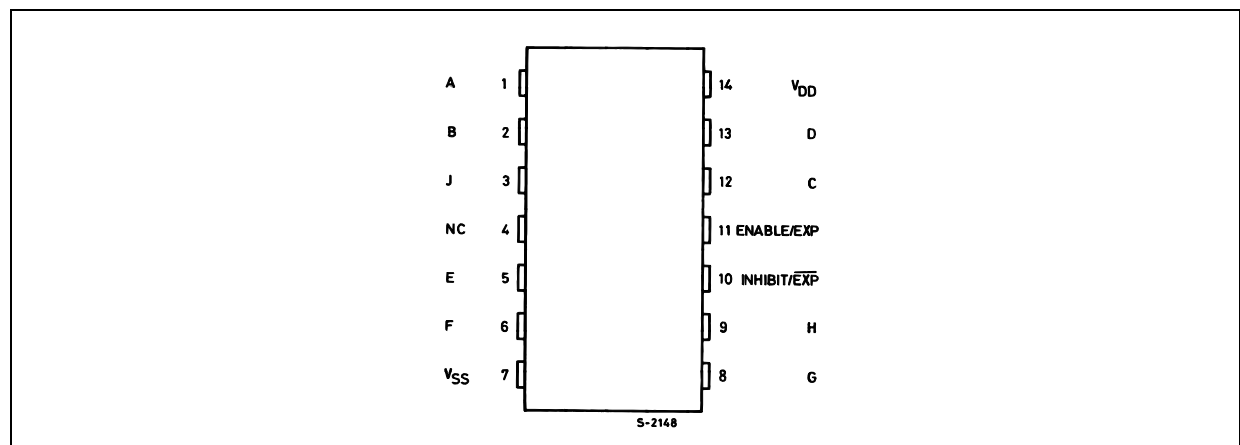


ORDER CODES

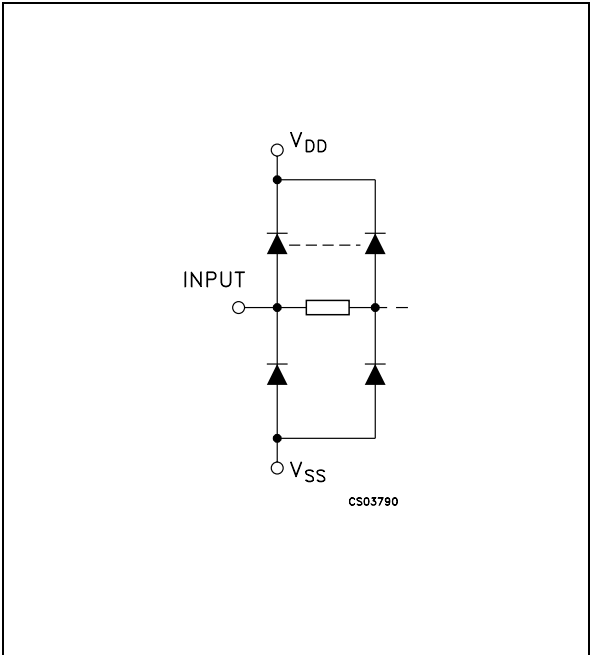
PACKAGE	TUBE	T & R
DIP	HCF4086BEY	
SOP	HCF4086BM1	HCF4086M013TR

HCF4086B contains one 4-wide 2-input AND-OR INVERT gates with an INHIBIT EXP input and an ENABLE/EXP input. INHIBIT/EXP is tied to V_{SS} and ENABLE/EXP to V_{DD} . For a 4 wide A-O-I function.

PIN CONNECTION



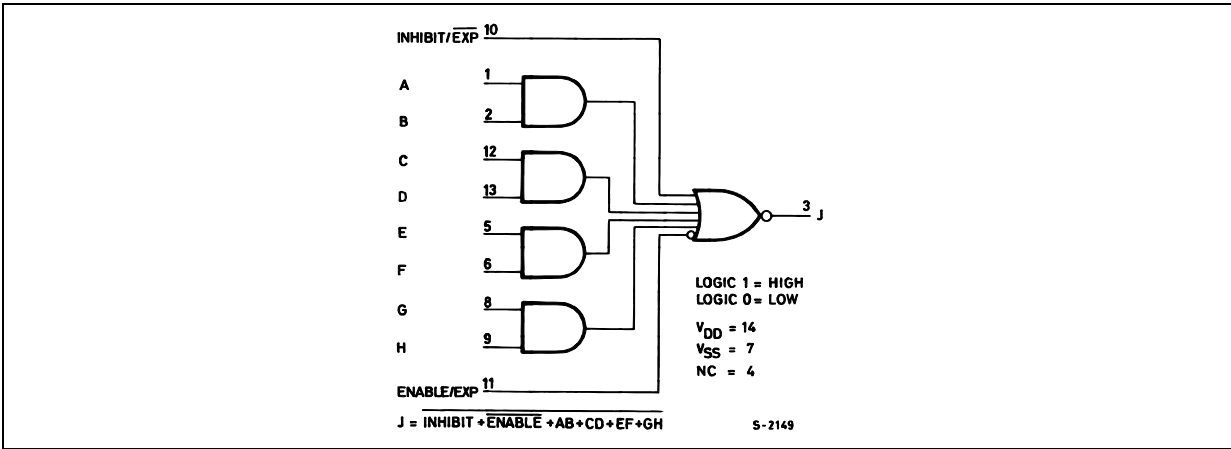
INPUT EQUIVALENT CIRCUIT



PIN DESCRIPTION

PIN No	SYMBOL	NAME AND FUNCTION
1, 2, 12, 13, 5, 6, 8, 9	A to H	Data Inputs
3	J	Output
10	INHIBIT/EXP	Inhibit Input
10	ENABLE/ EXP	Enable Input
4	NC	Not Connected
7	V _{SS}	Negative Supply Voltage
14	V _{DD}	Positive Supply Voltage

FUNCTIONAL DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{DD}	Supply Voltage	-0.5 to +22	V
V _I	DC Input Voltage	-0.5 to V _{DD} + 0.5	V
I _I	DC Input Current	± 10	mA
P _D	Power Dissipation per Package	200	mW
	Power Dissipation per Output Transistor	100	mW
T _{op}	Operating Temperature	-55 to +125	°C
T _{stg}	Storage Temperature	-65 to +150	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied.
All voltage values are referred to V_{SS} pin voltage.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
V_{DD}	Supply Voltage	3 to 20	V
V_I	Input Voltage	0 to V_{DD}	V
T_{op}	Operating Temperature	-55 to 125	°C

DC SPECIFICATIONS

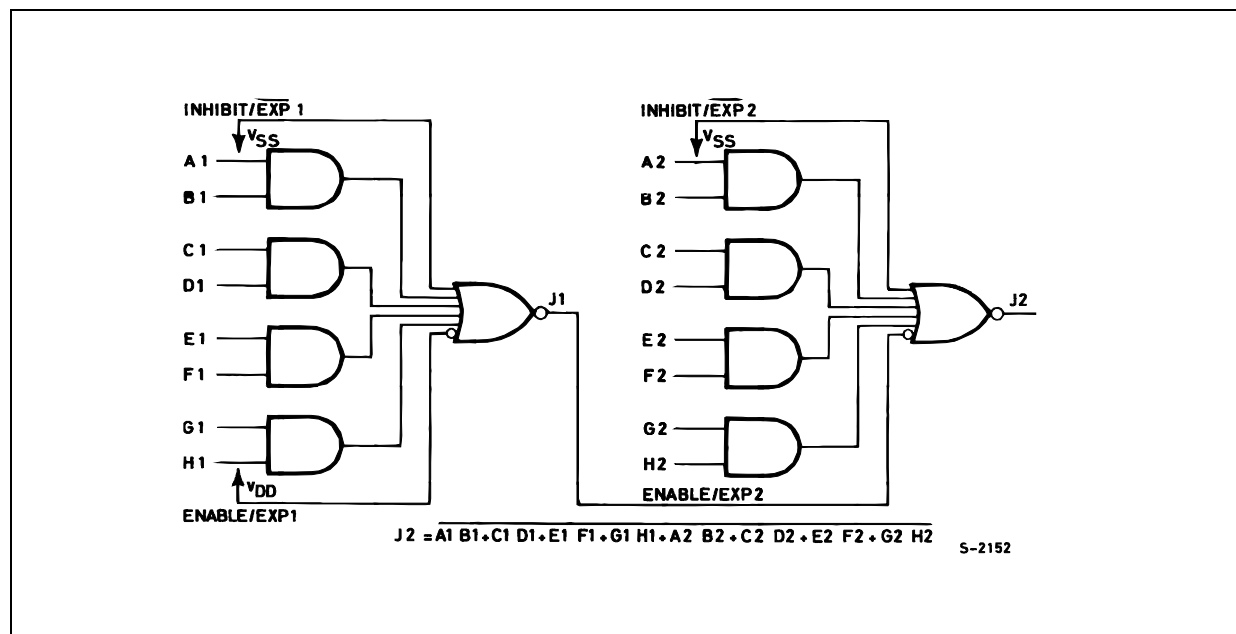
Symbol	Parameter	Test Condition				Value								Unit
		V _I (V)	V _O (V)	I _O (μA)	V _{DD} (V)	T _A = 25°C			-40 to 85°C		-55 to 125°C			
						Min.	Typ.	Max.	Min.	Max.	Min.	Max.		
I _L	Quiescent Current	0/5			5		0.02	1		30		30	μA	
		0/10			10		0.02	2		60		60		
		0/15			15		0.02	4		120		120		
		0/20			20		0.04	20		600		600		
V _{OH}	High Level Output Voltage	0/5		<1	5	4.95			4.95		4.95		V	
		0/10		<1	10	9.95			9.95		9.95			
		0/15		<1	15	14.95			14.95		14.95			
V _{OL}	Low Level Output Voltage	5/0		<1	5		0.05			0.05		0.05	V	
		10/0		<1	10		0.05			0.05		0.05		
		15/0		<1	15		0.05			0.05		0.05		
V _{IH}	High Level Input Voltage		0.5/4.5	<1	5	3.5			3.5		3.5		V	
			1/9	<1	10	7			7		7			
			1.5/13.5	<1	15	11			11		11			
V _{IL}	Low Level Input Voltage		4.5/0.5	<1	5			1.5		1.5		1.5	V	
			9/1	<1	10			3		3		3		
			13.5/1.5	<1	15			4		4		4		
I _{OH}	Output Drive Current	0/5	2.5	<1	5	-1.36	-3.2		-1.15		-1.1		mA	
		0/5	4.6	<1	5	-0.44	-1		-0.36		-0.36			
		0/10	9.5	<1	10	-1.1	-2.6		-0.9		-0.9			
		0/15	13.5	<1	15	-3.0	-6.8		-2.4		-2.4			
I _{OL}	Output Sink Current	0/5	0.4	<1	5	0.44	1		0.36		0.36		mA	
		0/10	0.5	<1	10	1.1	2.6		0.9		0.9			
		0/15	1.5	<1	15	3.0	6.8		2.4		2.4			
I _I	Input Leakage Current	0/18	Any Input		18		±10 ⁻⁵	±0.1		±1		±1	μA	
C _I	Input Capacitance		Any Input				5	7.5					pF	

The Noise Margin for both "1" and "0" level is: 1V min. with $V_{DD}=5V$, 2V min. with $V_{DD}=10V$, 2.5V min. with $V_{DD}=15V$

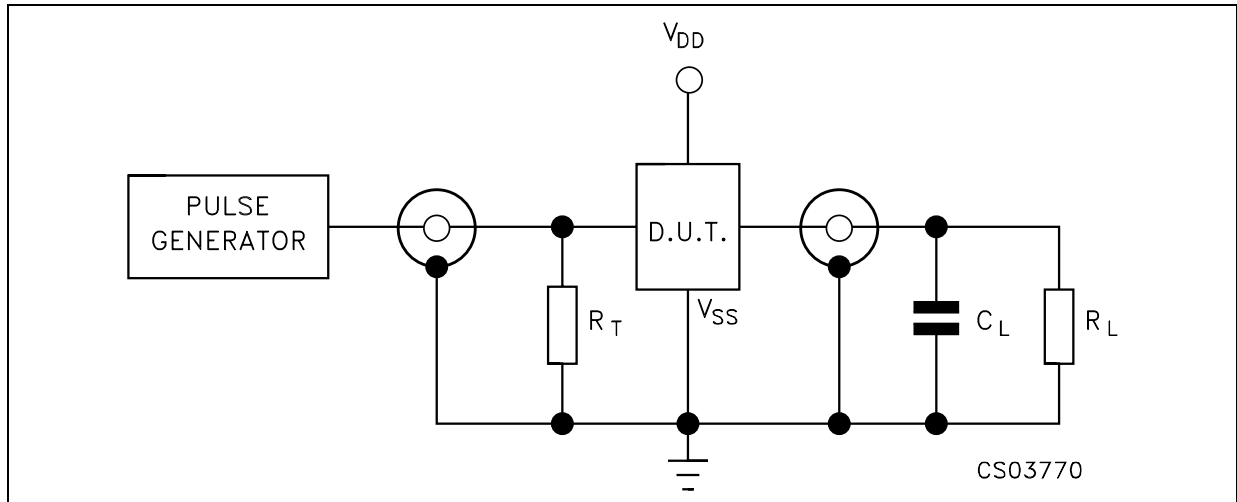
DYNAMIC ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$, $C_L = 50\text{pF}$, $R_L = 200\text{K}\Omega$, $t_r = t_f = 20\text{ ns}$)

Symbol	Parameter	Test Condition		Value (*)			Unit
		V_{DD} (V)		Min.	Typ.	Max.	
t_{PHL}	Propagation Delay Time (DATA)	5			225	450	ns
		10			90	180	
		15			60	120	
t_{PLH}	Propagation Delay Time (DATA)	5			310	620	ns
		10			125	250	
		15			90	180	
t_{PHL}	Propagation Delay Time (INHIBIT)	5			150	300	ns
		10			60	120	
		15			40	80	
t_{PLH}	Propagation Delay Time (INHIBIT)	5			250	500	ns
		10			100	200	
		15			70	140	
t_{TLH} t_{THL}	Transition Time	5			100	200	ns
		10			50	100	
		15			40	80	

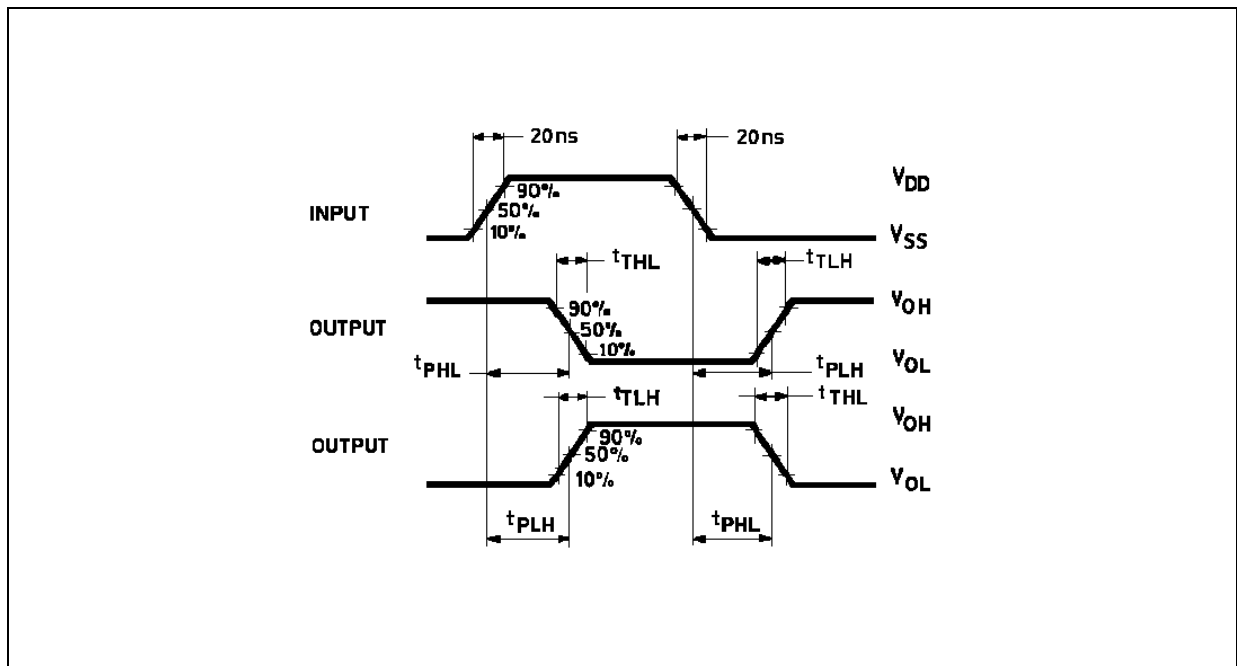
(*) Typical temperature coefficient for all V_{DD} value is 0.3 %/°C.

TYPICAL APPLICATION : Two HCF4086B Connected as an 8 wide 2 input A-O-I Gate

TEST CIRCUIT

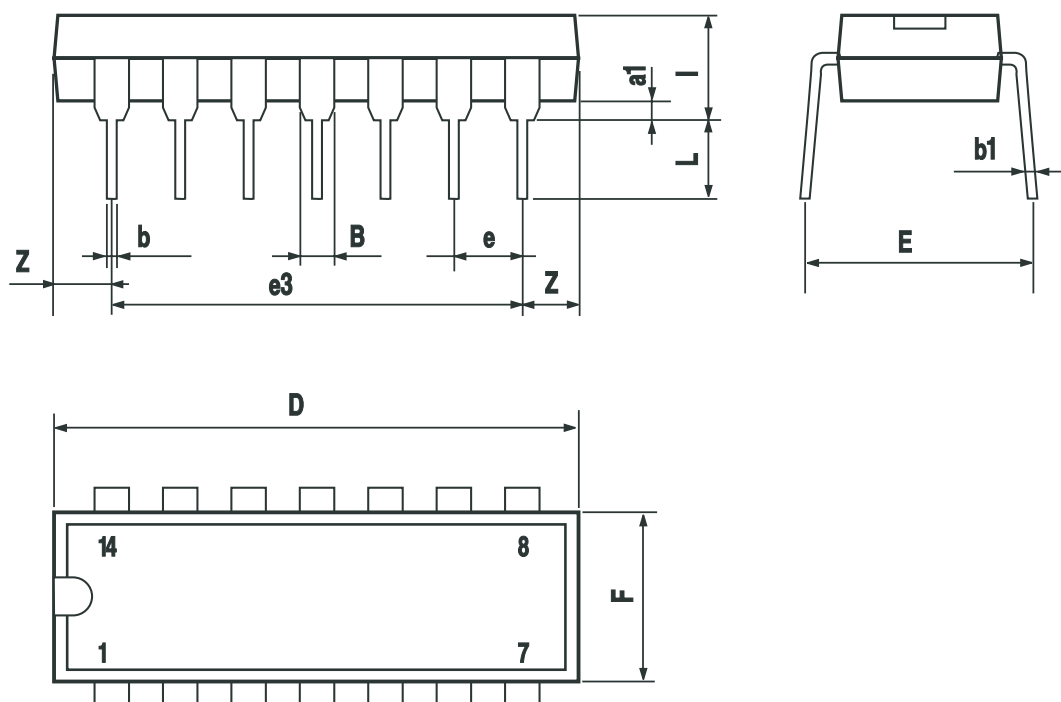


$C_L = 50\text{pF}$ or equivalent (includes jig and probe capacitance)
 $R_L = 200\text{k}\Omega$
 $R_T = Z_{\text{OUT}}$ of pulse generator (typically 50Ω)

WAVEFORM : PROPAGATION DELAY TIMES ($f=1\text{MHz}$; 50% duty cycle)

Plastic DIP-14 MECHANICAL DATA

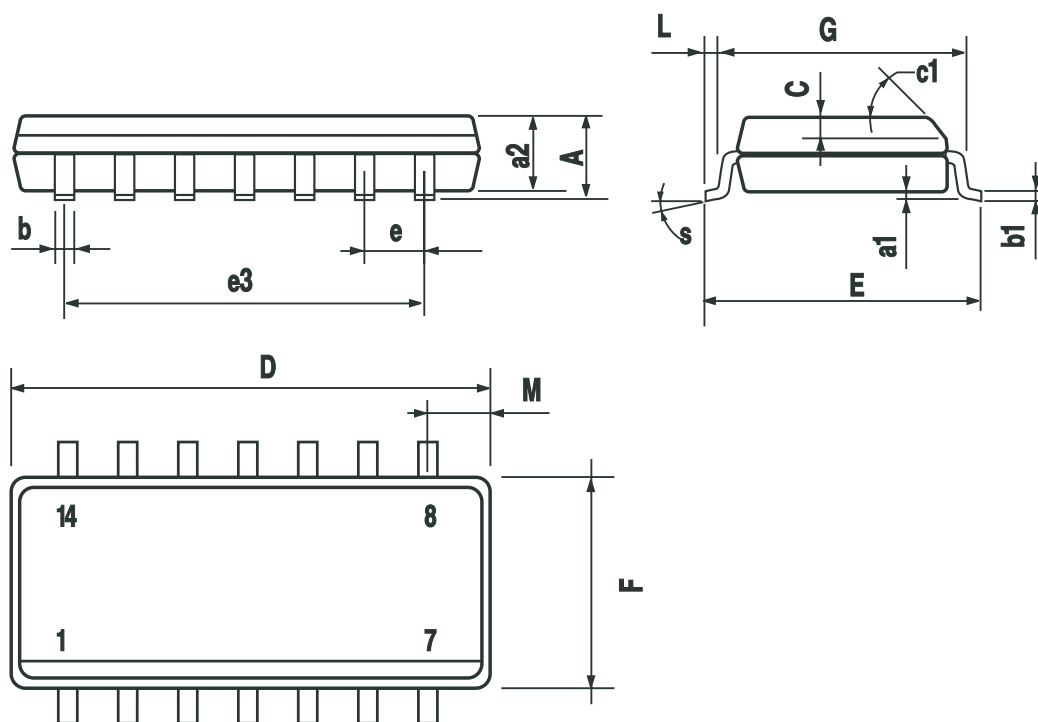
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	1.39		1.65	0.055		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		15.24			0.600	
F			7.1			0.280
I			5.1			0.201
L		3.3			0.130	
Z	1.27		2.54	0.050		0.100



P001A

SO-14 MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			1.75			0.068
a1	0.1		0.2	0.003		0.007
a2			1.65			0.064
b	0.35		0.46	0.013		0.018
b1	0.19		0.25	0.007		0.010
C		0.5			0.019	
c1	45° (typ.)					
D	8.55		8.75	0.336		0.344
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		7.62			0.300	
F	3.8		4.0	0.149		0.157
G	4.6		5.3	0.181		0.208
L	0.5		1.27	0.019		0.050
M			0.68			0.026
S	8° (max.)					



PO13G

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