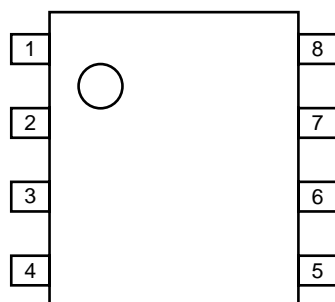


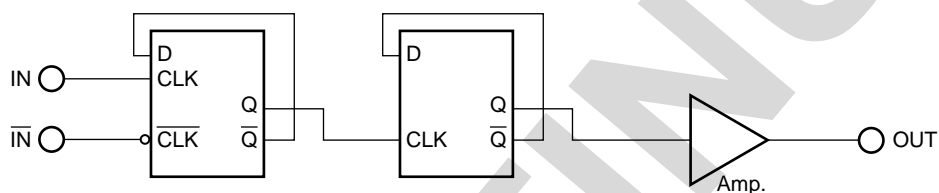
PIN CONNECTIONS

(Top View)



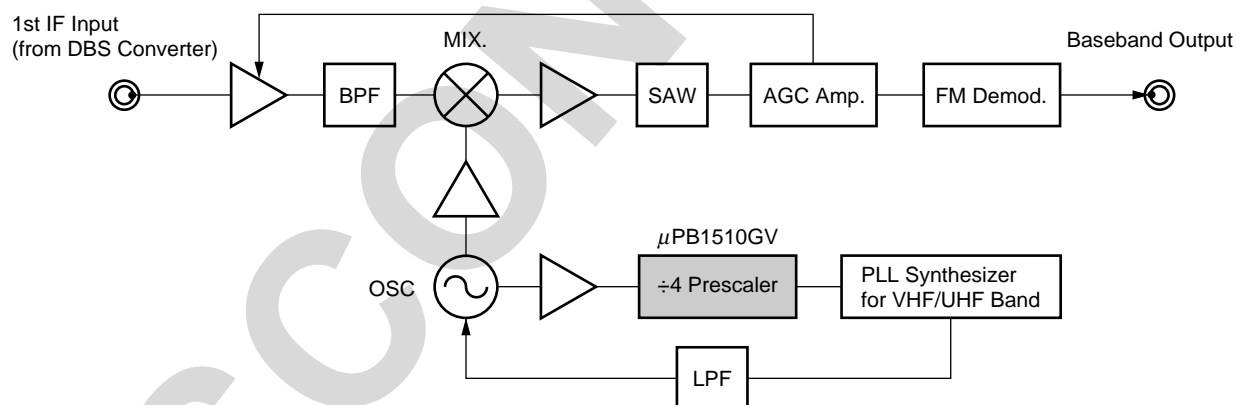
Pin No.	Pin Name
1	V _{CC}
2	IN
3	$\overline{\text{IN}}$
4	GND
5	GND
6	NC
7	OUT
8	NC

INTERNAL BLOCK DIAGRAM



SYSTEM APPLICATION EXAMPLE

RF unit block of DBS tuners



PIN EXPLANATION

Pin No.	Pin Name	Applied Voltage (V)	Pin Voltage (V)	Function and Application
1	V _{cc}	4.5 to 5.5	–	Supply voltage pin. This pin must be equipped with bypass capacitor (example: 1 000 pF) to minimize ground impedance.
2	IN	–	1.7 to 4.95	Signal input pin. This pin should be coupled to signal source with capacitor (example: 1 000 pF) for DC cut.
3	$\overline{\text{IN}}$	–	1.7 to 4.95	Signal input bypass pin. This pin must be equipped with bypass capacitor (example: 1 000 pF) to minimize ground impedance.
4, 5	GND	0	–	Ground pin. Ground pattern on the board should be formed as wide as possible to minimize ground impedance.
6, 8	NC	–	–	Non connection pins. These pins should be opened.
7	OUT	–	1.0 to 4.7	Divided frequency output pin. This pin is designed as emitter follower output. This pin can be connected to input of prescaler within PLL synthesizer through DC cut capacitor.

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Test Conditions	Ratings	Unit
Supply Voltage	V_{CC}	$T_A = +25^{\circ}\text{C}$	6.0	V
Power Dissipation	P_D	$T_A = +85^{\circ}\text{C}$ Note	250	mW
Operating Ambient Temperature	T_A		-40 to +85	$^{\circ}\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^{\circ}\text{C}$

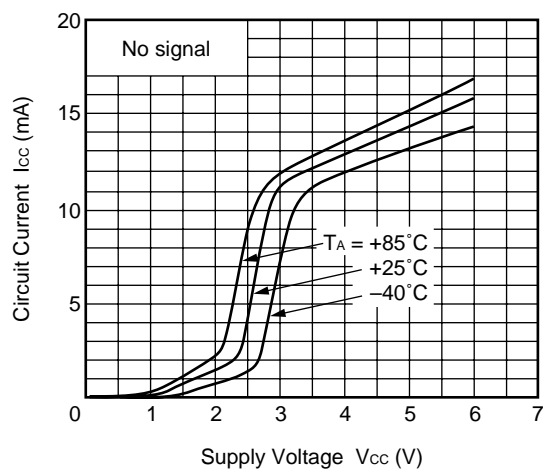
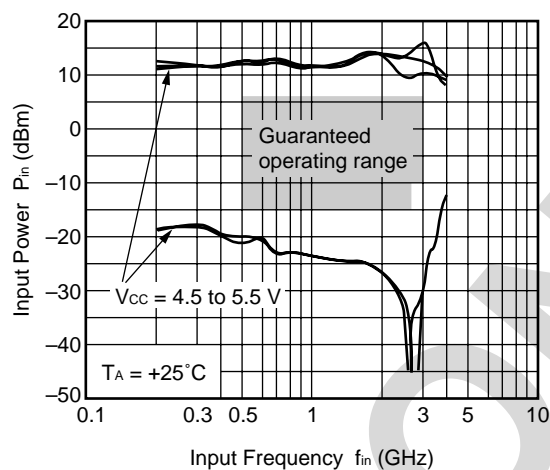
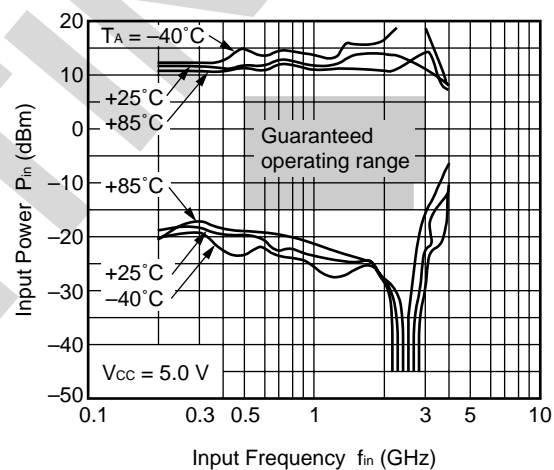
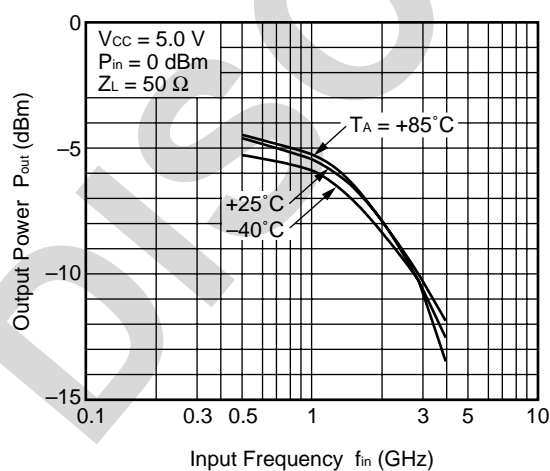
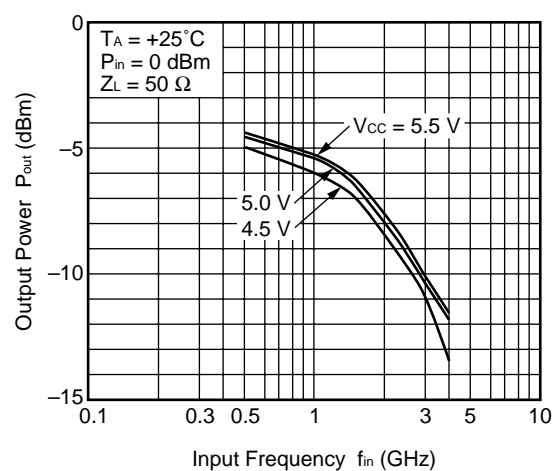
Note Mounted on double-sided copper-clad 50 × 50 × 1.6 mm epoxy glass PWB

RECOMMENDED OPERATING RANGE

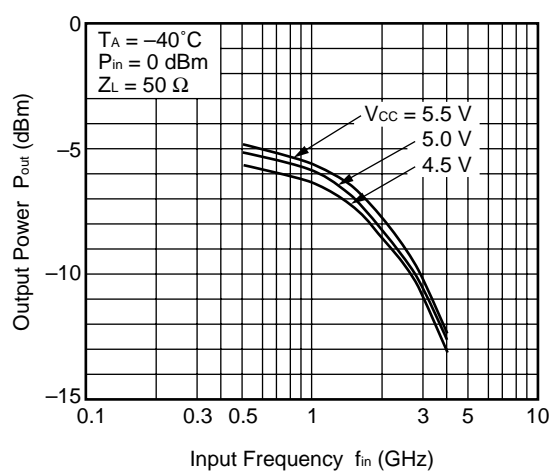
Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Supply Voltage	V_{CC}	4.5	5.0	5.5	V
Operating Ambient Temperature	T_A	-40	+25	+85	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS ($T_A = -40$ to $+85^{\circ}\text{C}$, $V_{CC} = 4.5$ to 5.5 V, $Z_s = Z_L = 50\ \Omega$)

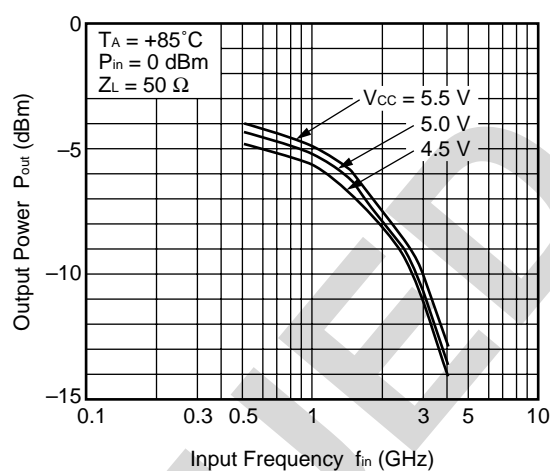
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Circuit Current	I_{CC}	No Signals	10.5	14	17	mA
Upper Limit Operating Frequency 1	$f_{in(U)1}$	$P_{in} = -10$ to $+6$ dBm	3.0	—	—	GHz
Upper Limit Operating Frequency 2	$f_{in(U)2}$	$P_{in} = -15$ to $+6$ dBm	2.7	—	—	GHz
Lower Limit Operating Frequency	$f_{in(L)}$	$P_{in} = -15$ to $+6$ dBm	—	—	0.5	GHz
Input Power 1	P_{in1}	$f_{in} = 2.7$ to 3.0 GHz	-10	—	+6	dBm
Input Power 2	P_{in2}	$f_{in} = 0.5$ to 2.7 GHz	-15	—	+6	dBm
Output Power	P_{out}	$P_{in} = 0$ dBm, $f_{in} = 2.0$ GHz	-12	-7	—	dBm

TYPICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, $V_{CC} = 5\text{ V}$, unless otherwise specified)**CIRCUIT CURRENT vs. SUPPLY VOLTAGE****INPUT POWER vs. INPUT FREQUENCY****INPUT POWER vs. INPUT FREQUENCY****OUTPUT POWER vs. INPUT FREQUENCY****OUTPUT POWER vs. INPUT FREQUENCY**

OUTPUT POWER vs. INPUT FREQUENCY



OUTPUT POWER vs. INPUT FREQUENCY

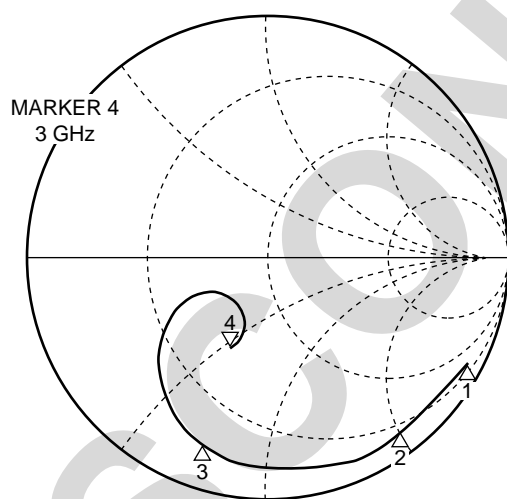


Remark The graphs indicate nominal characteristics.

S_{11} vs. INPUT FREQUENCY

$V_{CC} = 5.0\text{ V}$, $T_A = +25^\circ\text{C}$, $Z_O = 50\ \Omega$

S_{11} Z
 REF 1.0 Units
 4 200.0 mUnits/
 ∇ 27.159 Ω -27.582 Ω
 hp

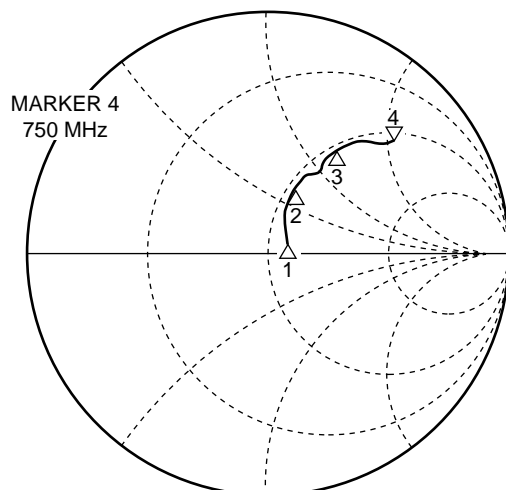


START 0.500000000 GHz
 STOP 3.000000000 GHz

Frequency (MHz)	S_{11} (Ω)
500	37.1-j207.8
1 000	14.2-j105.1
2 000	7.9-j35.8
3 000	27.1-j27.5

S₂₂ vs. OUTPUT FREQUENCYV_{CC} = 5.0 V, f_{in} = 500 MHz, T_A = +25°C, Z_O = 50 Ω

S₂₂ Z
 REF 1.0 Units
 4 200.0 mUnits/
 ▽ 60.925 Ω 104.77 Ω
 hp



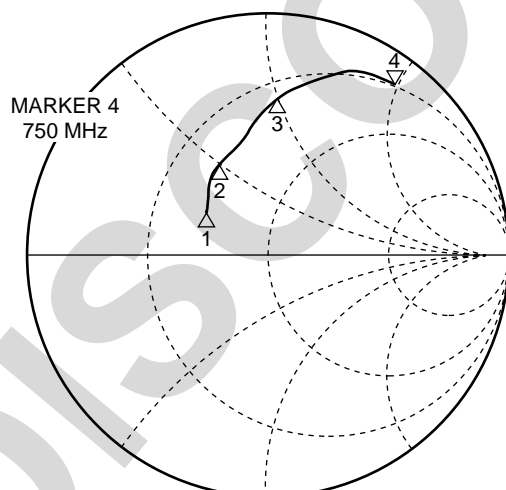
START 0.125000000 GHz
 STOP 0.750000000 GHz

▽ 1 : 125 MHz
 ▽ 2 : 250 MHz
 ▽ 3 : 500 MHz
 ▽ 4 : 750 MHz

Frequency (MHz)	S ₂₂ (Ω)
125	55.5+j6.7
250	53.7+j30.4
500	55.0+j60.3
750	60.9+j104.8

V_{CC} = 5.0 V, f_{in} = 3.0 GHz, T_A = +25°C, Z_O = 50 Ω

S₂₂ Z
 REF 1.0 Units
 4 200.0 mUnits/
 ▽ 15.613 Ω 98.168 Ω
 hp

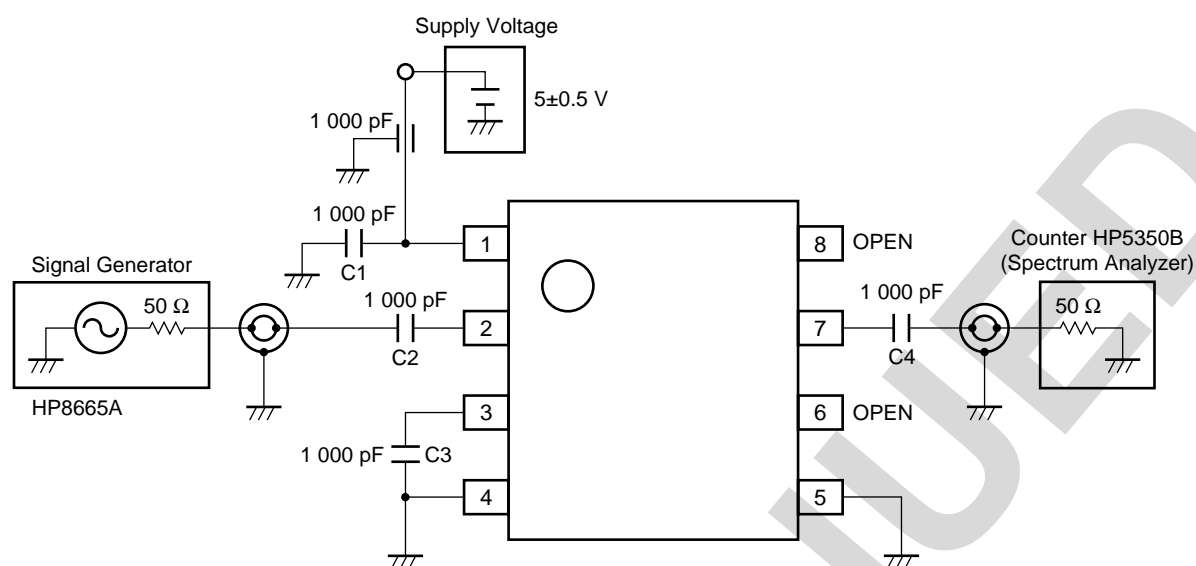


START 0.125000000 GHz
 STOP 0.750000000 GHz

▽ 1 : 125 MHz
 ▽ 2 : 250 MHz
 ▽ 3 : 500 MHz
 ▽ 4 : 750 MHz

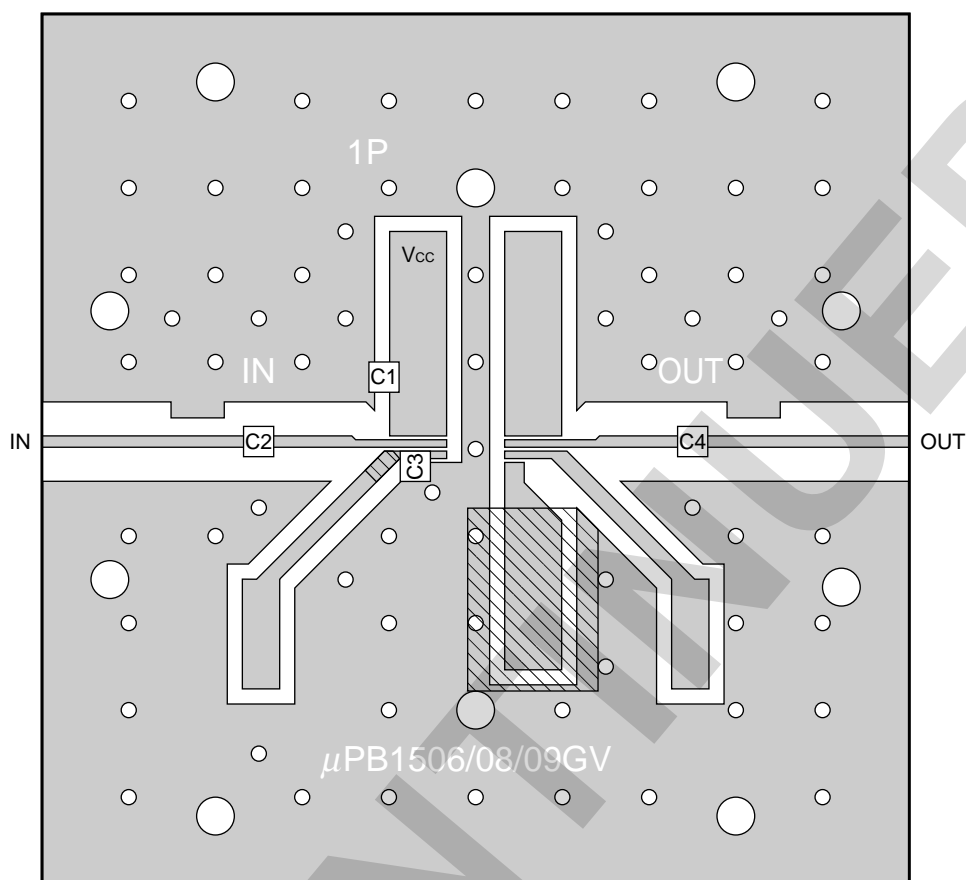
Frequency (MHz)	S ₂₂ (Ω)
125	28.5+j11.5
250	27.6+j23.6
500	20.5+j50.7
750	15.6+j98.2

TEST CIRCUIT



The application circuits and their parameters are for reference only and are not intended for use in actual design-ins.



ILLUSTRATION OF THE TEST CIRCUIT ASSEMBLED ON EVALUATION BOARD



COMPONENT LIST

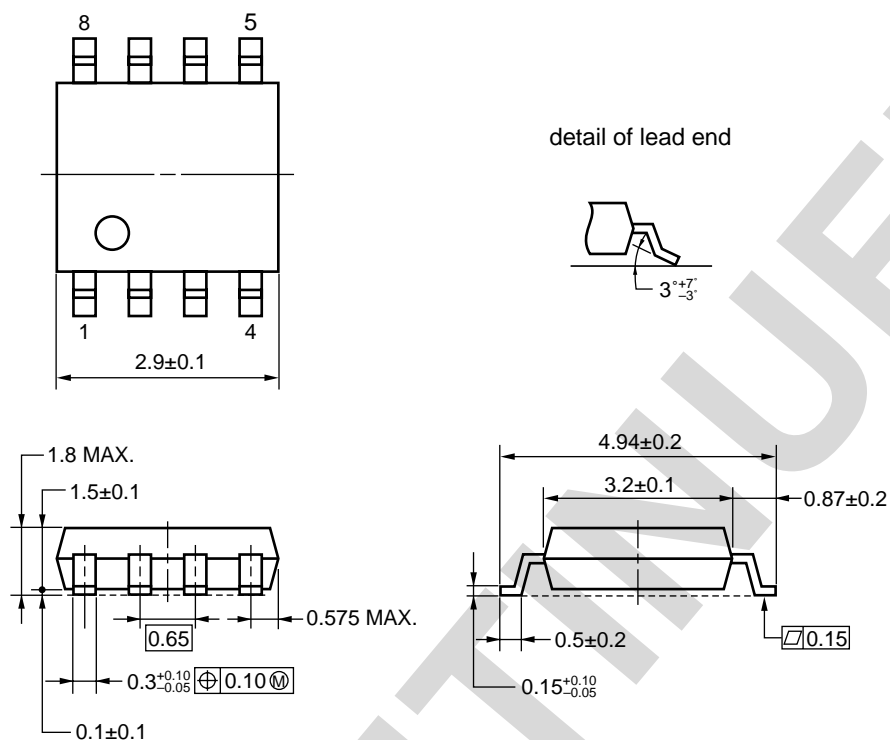
	Value
C1 to C4	1 000 pF

Notes

- (1) 35 μ m thick double-sided copper-clad 50 \times 50 \times 0.4 mm polyimide board.
- (2) Back side : GND pattern
- (3) Solder plated on pattern
- (4) \circ \circ : Through holes
- (5)  of pin 3 : Pattern should be removed.
- (6)  of pin 5 : Short chip must be attached to be grounded.

★ PACKAGE DIMENSIONS

8-PIN PLASTIC SSOP (4.45 mm (175)) (UNIT: mm)



NOTES ON CORRECT USE

- (1) Observe precautions for handling because of electro-static sensitive devices.
- (2) Form a ground pattern as widely as possible to minimize ground impedance (to prevent undesired oscillation).
- (3) Keep the wiring length of the ground pins as short as possible.
- (4) Connect a bypass capacitor (example: 1 000 pF) to the V_{cc} pin.

★ **RECOMMENDED SOLDERING CONDITIONS**

This product should be soldered and mounted under the following recommended conditions. For soldering methods and conditions other than those recommended below, contact your nearby sales office.

Soldering Method	Soldering Conditions	Condition Symbol
Infrared Reflow	Peak temperature (package surface temperature) : 260°C or below Time at peak temperature : 10 seconds or less Time at temperature of 220°C or higher : 60 seconds or less Preheating time at 120 to 180°C : 120±30 seconds Maximum number of reflow processes : 3 times Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	IR260
VPS	Peak temperature (package surface temperature) : 215°C or below Time at temperature of 200°C or higher : 25 to 40 seconds Preheating time at 120 to 150°C : 30 to 60 seconds Maximum number of reflow processes : 3 times Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	VP215
Wave Soldering	Peak temperature (molten solder temperature) : 260°C or below Time at peak temperature : 10 seconds or less Preheating temperature (package surface temperature) : 120°C or below Maximum number of flow processes : 1 time Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	WS260
Partial Heating	Peak temperature (pin temperature) : 350°C or below Soldering time (per side of device) : 3 seconds or less Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	HS350

Caution Do not use different soldering methods together (except for partial heating).