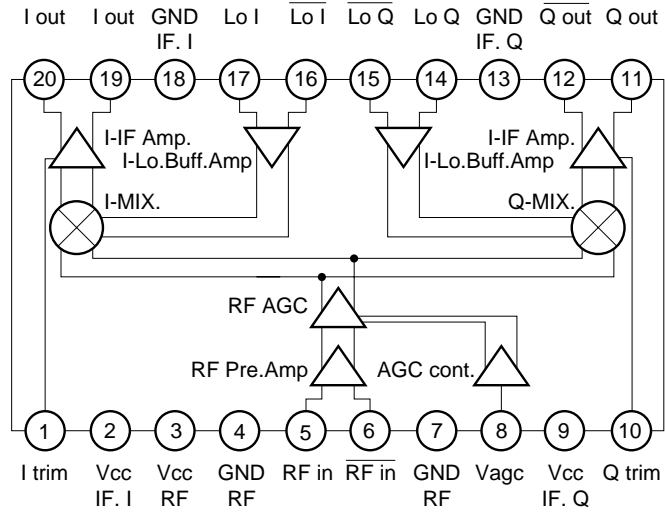
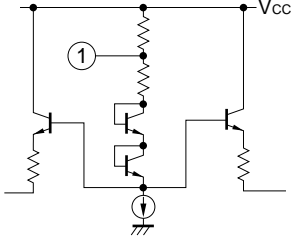
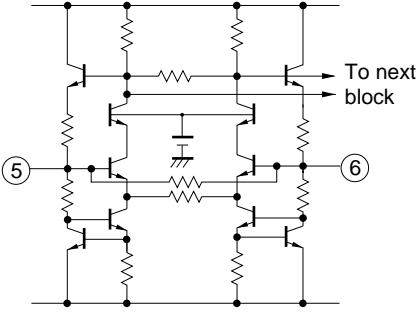
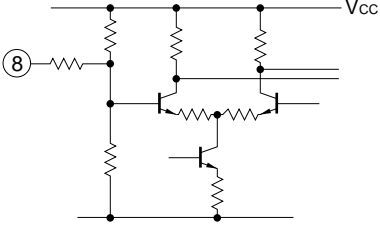
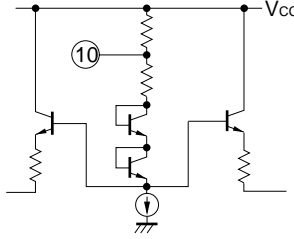


INTERNAL BLOCK DIAGRAM



PIN FUNCTIONS

PIN No.	PIN NAME	PIN VOLTAGE TYP. (V)	FUNCTION AND EXPLANATION	EQUIVALENT CIRCUIT
1	I Trim	4.2	Trimming pin for I-IF output.	
2	V _{cc} IF I	5.0	Power supply pin for I-MIXER.	
3	V _{cc} RF	5.0	Power supply pin for RF and AGC block.	
4	GND RF	0.0	Ground pin of RF and AGC block.	
5	RFin	2.6	RF input pin. In case of single input, 6 pin should be grounded through capacitor.	
6	RFin	2.6		
7	GND RF	0.0	Ground pin of RF and AGC block.	
8	V _{AGC}	0 to 5	Gain control pin. <ul style="list-style-type: none"> V_{AGC} = 0 V: Full gain V_{AGC} = 5 V: Maximum reduction 	
9	V _{cc} IF Q	5.0	Power supply pin for Q-MIXER.	
10	Q Trim	4.2	Trimming pin for Q-IF output.	

PIN No.	PIN NAME	PIN VOLTAGE TYP. (V)	FUNCTION AND EXPLANATION	EQUIVALENT CIRCUIT
11	Qout	3.3	Q-IF output pin. 11 pin and 12 pin are balance outputs.	
12	$\overline{\text{Qout}}$	3.3		
13	GNDIF Q	0.0	Ground pin of Q-IF block.	
14	Lo Q	2.2	Oscillator signal input pin of Q-MIXER. In case of single input, 15 pin should be grounded through capacitor.	
15	$\overline{\text{Lo Q}}$	2.2		
16	$\overline{\text{Lo I}}$	2.2	Oscillator signal input pin of I-MIXER. In case of single input, 16 pin should be grounded through capacitor.	
17	Lo I	2.2		
18	GNDIF I	0.0	Ground pin of I-IF block.	
19	$\overline{\text{lout}}$	3.3	I-IF output pin. 19 pin and 20 pin are balance outputs.	
20	lout	3.3		

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C)

μPC2766GR

PARAMETER	SYMBOL	RATING	UNIT	TEST CONDITIONS
Supply voltage	V _{CC}	6.0	V	
Power dissipation	P _D	430	mW	T _A = 85 °C ^{Note 1}
Operating temperature range	T _A	-40 to +85	°C	
Storage temperature range	T _{stg}	-55 to +150	°C	

μPC2766GS

PARAMETER	SYMBOL	RATING	UNIT	TEST CONDITIONS
Supply voltage	V _{CC}	6.0	V	
Power dissipation	P _D	650	mW	T _A = 85 °C ^{Note 1}
Operating temperature range	T _A	-40 to +85	°C	
Storage temperature range	T _{stg}	-55 to +150	°C	

Note 1 Mounted on 50 × 50 × 1.6 mm double epoxy glass board.

RECOMMENDED OPERATING RANGE

μPC2766GR/GS

PARAMETER	SYMBOL	MAX.	TYP.	MIN.	UNIT
Supply voltage	V _{CC}	4.5	5.0	5.5	V
Operating temperature range	T _A	-40	+25	+85	°C

ELECTRICAL CHARACTERISTICS (V_{CC} = 5 V, T_A = 25 °C, Z_L = 250 Ω)

μPC2766GR/GS

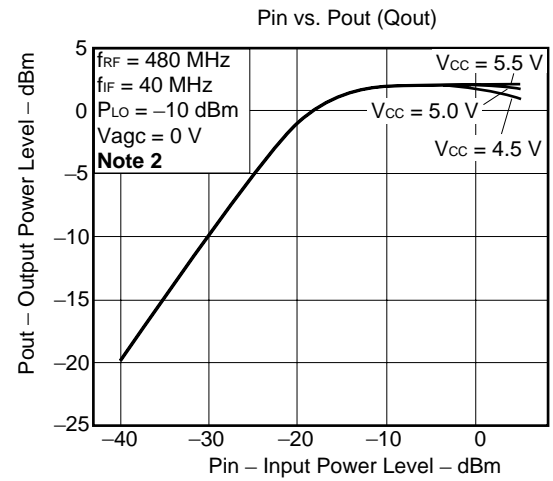
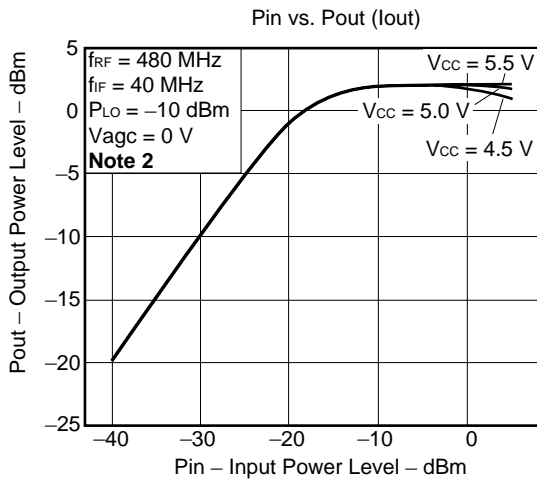
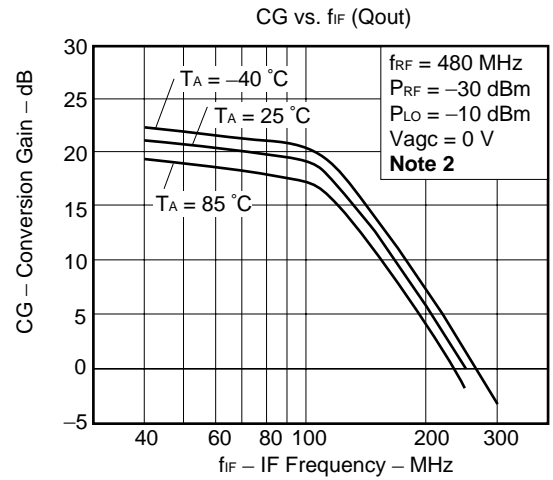
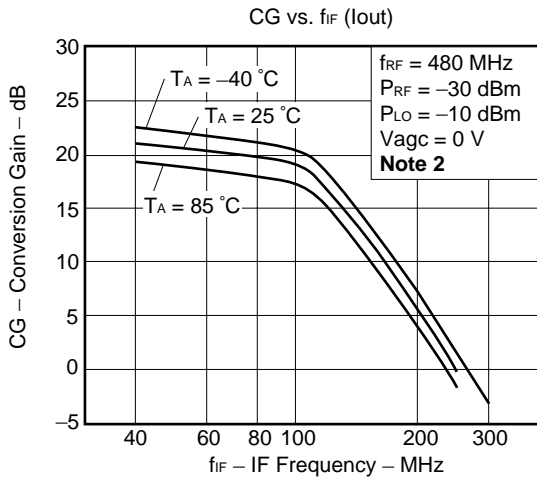
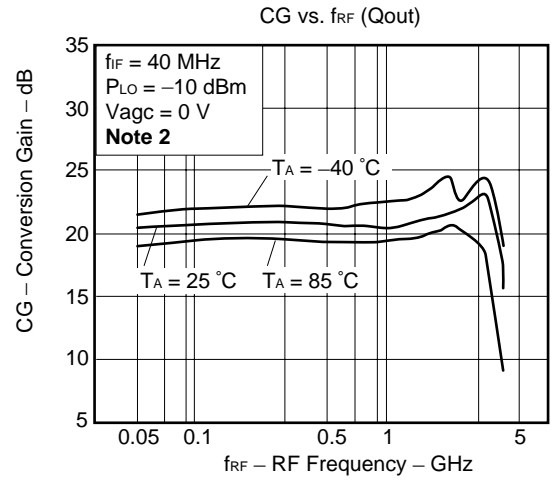
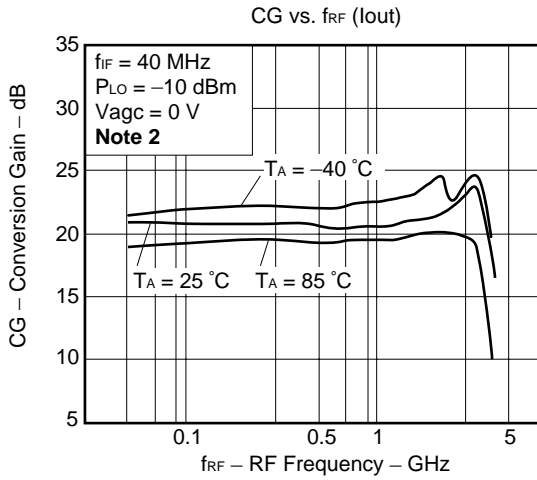
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Supply current	I _{CC}	–	60	78	mA	no input signal
RF input bandwidth	RF BW	DC - 750	DC - 1000	–	MHz	f _{IF} = 40 MHz, f _{RF} > f _{LO} IQ phase balance ≤ ±1.5°
IF output bandwidth	IF BW	DC	200	–	MHz	f _{RF} = 480 MHz, P _{LO} = –10 dBm f _{RF} > f _{LO} , –3 dB down, V _{agc} = 0 V
Gain control range	G _{GC}	40	45	–	dB	f _{RF} = 480 MHz, f _{IF} = 40 MHz P _{RF} = –30 dBm, P _{LO} = –10 dBm V _{agc} = 0 – 5 V
IQ phase balance	Δφ	–	±0.3	±1.5	deg	f _{RF} = 480 MHz, f _{IF} = 40 MHz P _{RF} = –30 dBm, P _{LO} = –10 dBm
IQ amplitude balance	ΔG	–	±0.3	±0.5	dB	f _{RF} = 480 MHz, f _{IF} = 40 MHz P _{RF} = –30 dBm, P _{LO} = –10 dBm V _{agc} = 0 V
Output voltage	V _O	1.2	1.5	–	V _{P-P}	f _{RF} = 480 MHz, f _{IF} = 40 MHz P _{LO} = –10 dBm, Z _L = 250 Ω
Conversion gain	CG	15	20	25	dB	f _{RF} = 480 MHz, f _{IF} = 40 MHz V _{agc} = 0 V

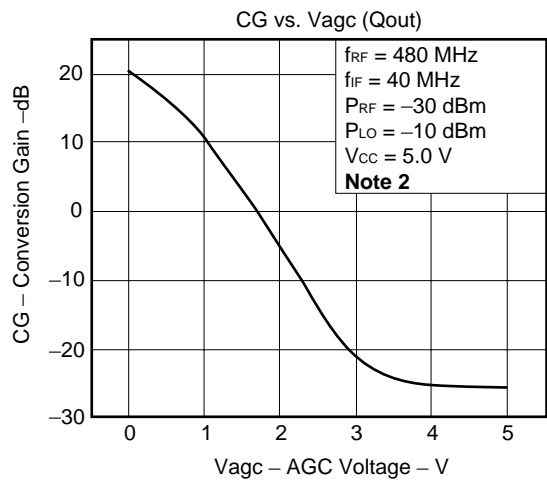
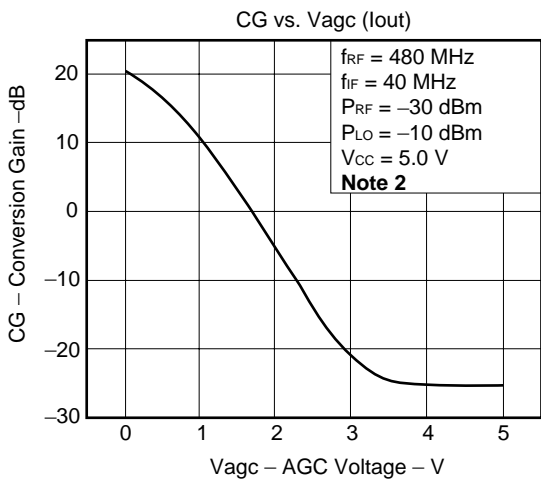
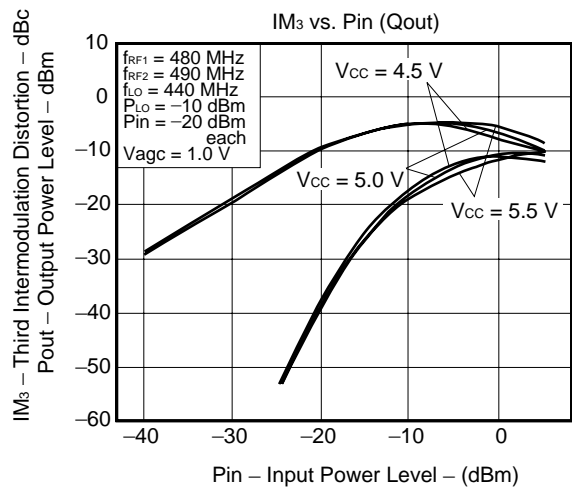
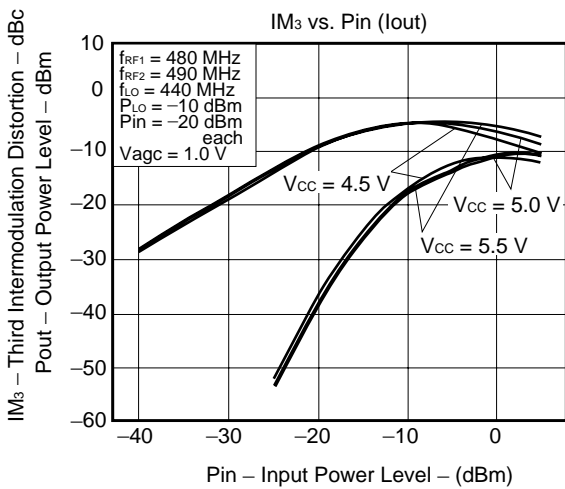
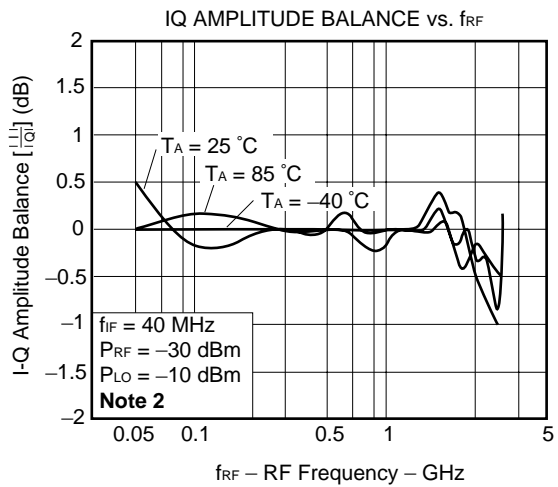
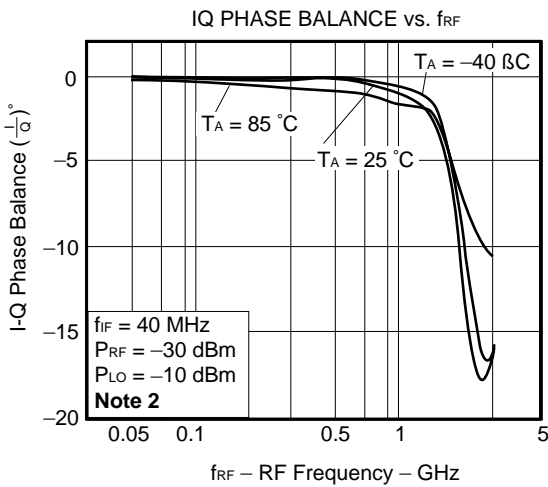
STANDARD CHARACTERISTICS (REFERENCE VALUES) (V_{CC} = 5 V, T_A = 25 °C, Z_L = 250 Ω)

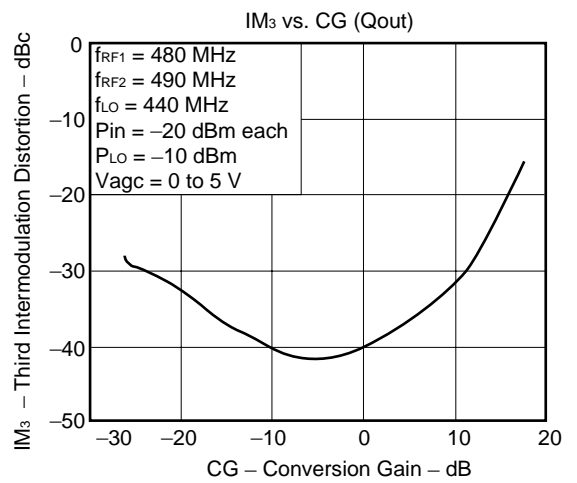
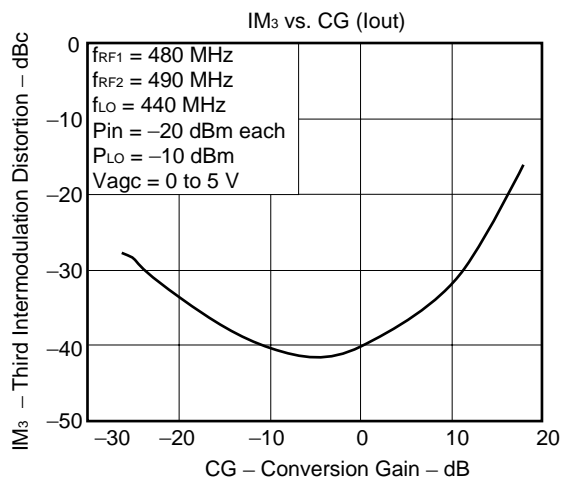
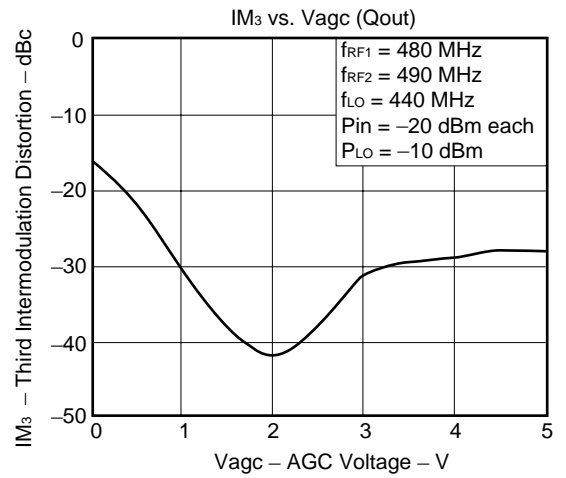
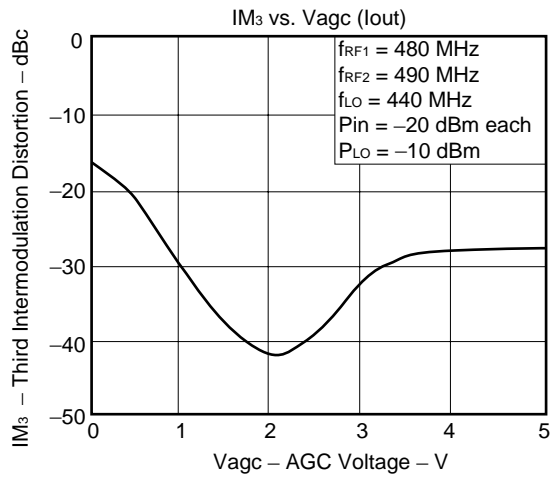
μPC2766GR/GS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Noise figure	NF	–	21	–	dB	f _{RF} = 480 MHz, f _{IF} = 40 MHz P _{LO} = –10 dBm, V _{agc} = 0 V
LO to RF isolation	LO-RF _{isol}	–	55	–	dB	f _{LO} = 440 MHz, P _{LO} = –10 dBm V _{agc} = 0 V
LO to IF isolation	LO-IF _{isol}	–	10	–	dB	f _{LO} = 440 MHz, P _{LO} = –10 dBm V _{agc} = 0 V
3rd order intermodulation distortion	IM ₃	–	30	–	dBc	f _{RF1} = 480 MHz, f _{RF2} = 490 MHz f _{LO} = 440 MHz, P _{in} = –20 dBm P _{LO} = –10 dBm, V _{agc} = 1 V
Saturated output level	P _{O(SAT)}	–	+2	–	dBm	f _{RF} = 480 MHz, f _{IF} = 40 MHz P _{RF} = –10 dBm

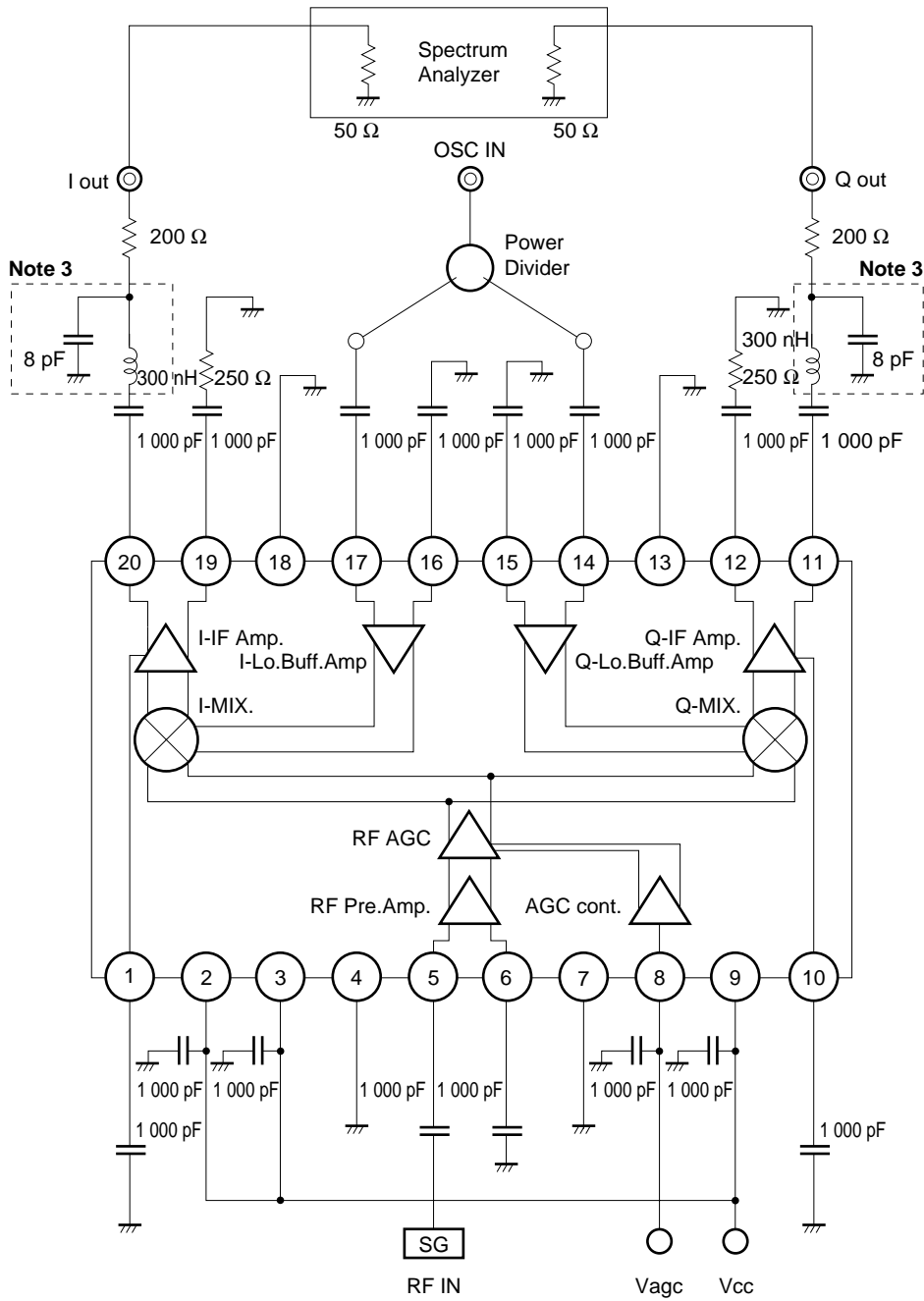
TYPICAL CHARACTERISTICS – on Measurement Circuit – (Note 2 Lower local)





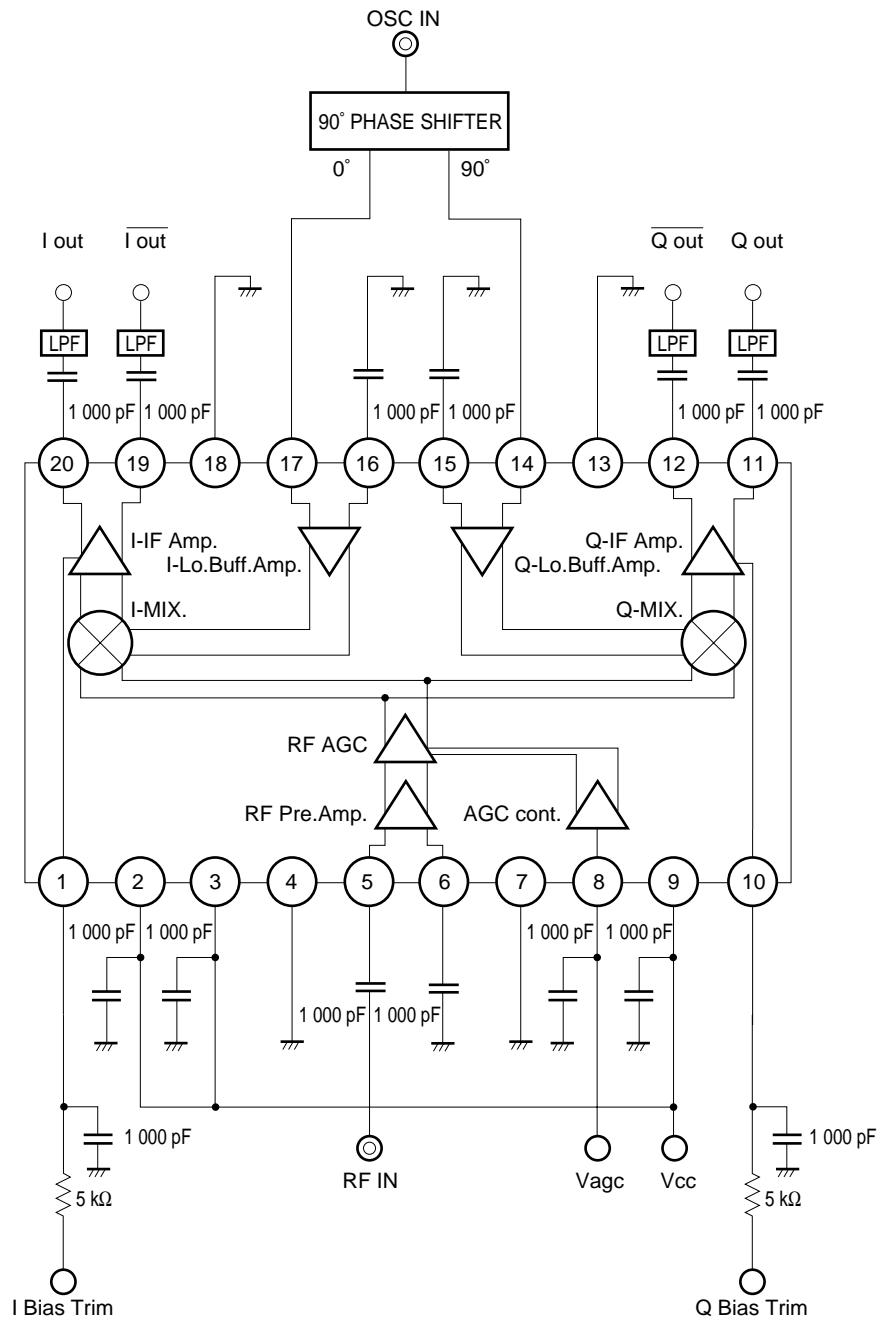


MEASUREMENT CIRCUIT
 (@ $Z_L = 250 \Omega$)



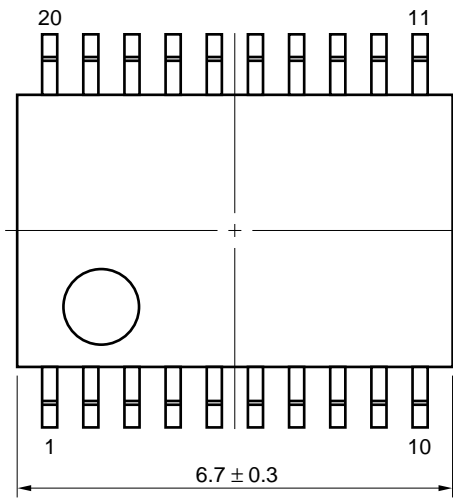
Note 3 [] is Low pass filter in order to eliminate local leak.

APPLICATION CIRCUIT EXAMPLE

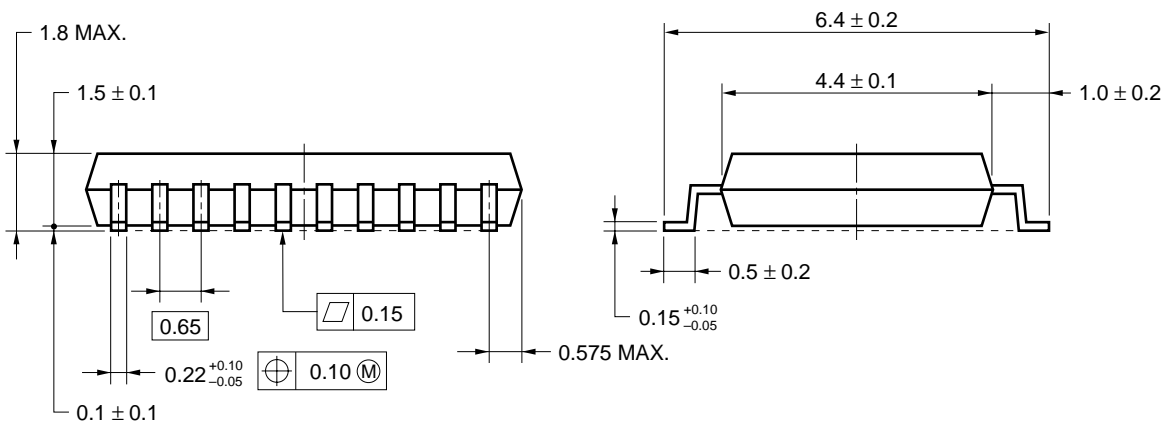
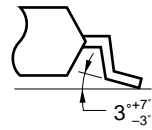


PACKAGE DIMENSIONS

★ 20 PIN PLASTIC SSOP (225 mil) (UNIT: mm)

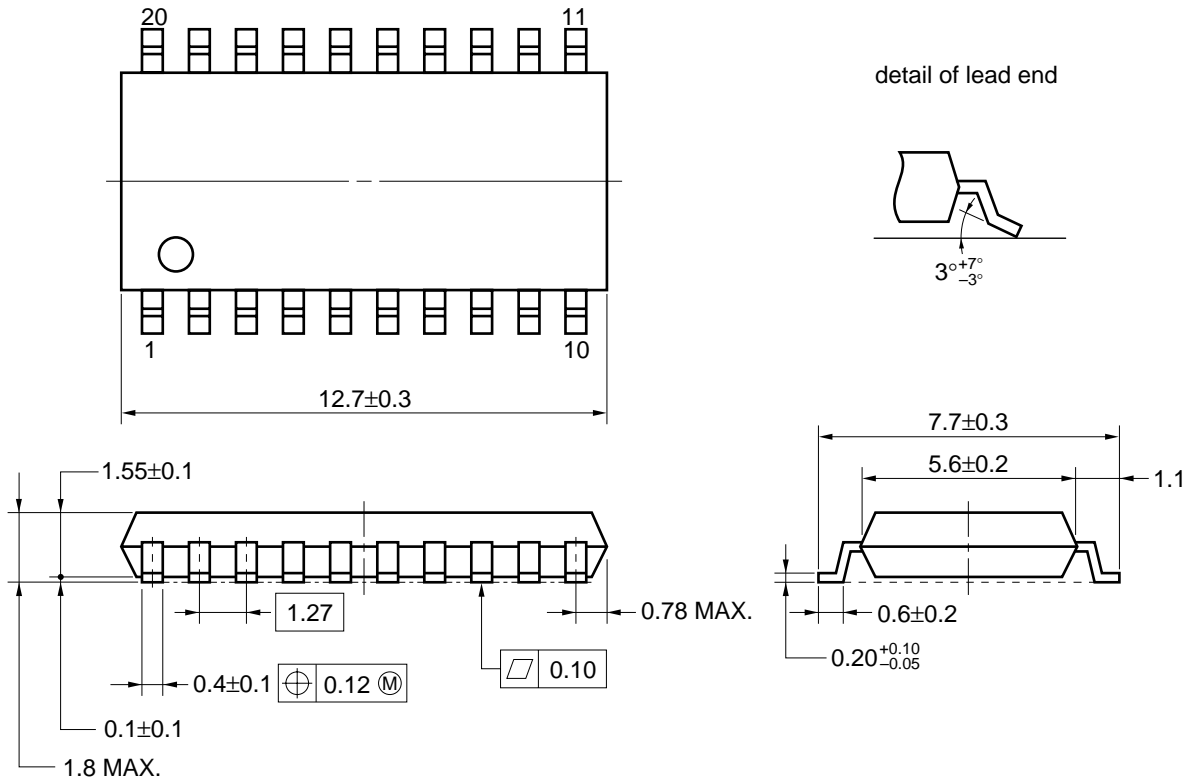


detail of lead end



NOTE Each lead centerline is located within 0.10 mm of its true position (T.P.) at maximum material condition.

★ 20 PIN PLASTIC SOP (300 mil) (UNIT: mm)



NOTE Each lead centerline is located within 0.12 mm of its true position (T.P.) at maximum material condition.

RECOMMENDED SOLDERING CONDITIONS

The following conditions (see table below) must be met when soldering this product.

Please consult with our sales offices in case other soldering process is used or in case soldering is done under different conditions.

For details of recommended soldering conditions for surface mounting, refer to information document **SEMICONDUCTOR DEVICE MOUNTING TECHNOLOGY MANUAL (C10535E)**.

μPC2766GR

Soldering process	Soldering conditions	Symbol
Infrared ray reflow	Peak package's surface temperature: 235 °C or below, Reflow time: 30 seconds or below (210 °C or higher), Number of reflow process: 3, Exposure limit ^{Note} : None	IR35-00-3
VPS	Peak package's surface temperature: 215 °C or below, Reflow time: 40 seconds or below (200 °C or higher), Number of reflow process: 3, Exposure limit ^{Note} : None	VP15-00-3
Wave soldering	Solder temperature: 260 °C or below, Flow time: 10 seconds or below, Number of flow process: 1, Exposure limit ^{Note} : None	WS60-00-1
Partial heating method	Terminal temperature: 300 °C or below, Flow time: 3 seconds or below, Exposure limit ^{Note} : None	

Note Exposure limit before soldering after dry-pack package is opened.
Storage conditions: 25 °C and relative humidity at 65 % or less.

Caution Do not apply more than single process at once, except for "Partial heating method".

[MEMO]

- **The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.**
 - No part of this document may be copied or reproduced in any form or by any means without the prior written consent of NEC Corporation. NEC Corporation assumes no responsibility for any errors which may appear in this document.
 - NEC Corporation does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from use of a device described herein or any other liability arising from use of such device. No license, either express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC Corporation or others.
 - Descriptions of circuits, software, and other related information in this document are provided for illustrative purposes in semiconductor product operation and application examples. The incorporation of these circuits, software, and information in the design of the customer's equipment shall be done under the full responsibility of the customer. NEC Corporation assumes no responsibility for any losses incurred by the customer or third parties arising from the use of these circuits, software, and information.
 - While NEC Corporation has been making continuous effort to enhance the reliability of its semiconductor devices, the possibility of defects cannot be eliminated entirely. To minimize risks of damage or injury to persons or property arising from a defect in an NEC semiconductor device, customers must incorporate sufficient safety measures in its design, such as redundancy, fire-containment, and anti-failure features.
 - NEC devices are classified into the following three quality grades:
"Standard", "Special", and "Specific". The Specific quality grade applies only to devices developed based on a customer designated "quality assurance program" for a specific application. The recommended applications of a device depend on its quality grade, as indicated below. Customers must check the quality grade of each device before using it in a particular application.
 - Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots
 - Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)
 - Specific: Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.
- The quality grade of NEC devices is "Standard" unless otherwise specified in NEC's Data Sheets or Data Books. If customers intend to use NEC devices for applications other than those specified for Standard quality grade, they should contact an NEC sales representative in advance.