Ordering number : ENA2052

SANYO Semiconductors
DATA SHEET

An ON Semiconductor Company

Monolithic Linear IC

LA1225MC — FM IF Detector IC

Overview

The LA1225MC is a Low-voltage operation (1.8V or higher) FM IF detector IC for the electronic tuning system.

Features

- Low-voltage operation (1.8V or higher)
- Supports electronic tuning systems (provides built-in SD output and IF count output functions)
- FM detector circuit accepts an even wider input frequency range. (Supports the use of an external phase capacitor.)
- Miniature package: SOIC10

Functions

- IF amplifier
- Quadrature detector
- Signal meter
- SD
- IF buffer

Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		9.0	V
Allowable power dissipation	Pd max	Ta ≤ 85°C	100	mW
Operating temperature	Topr		-20 to +85	°C
Storage temperature	Tstg		-55 to +150	°C

Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		3.0	V
Operating supply voltage range	V_{CC} op		1.8 to 8.0	V

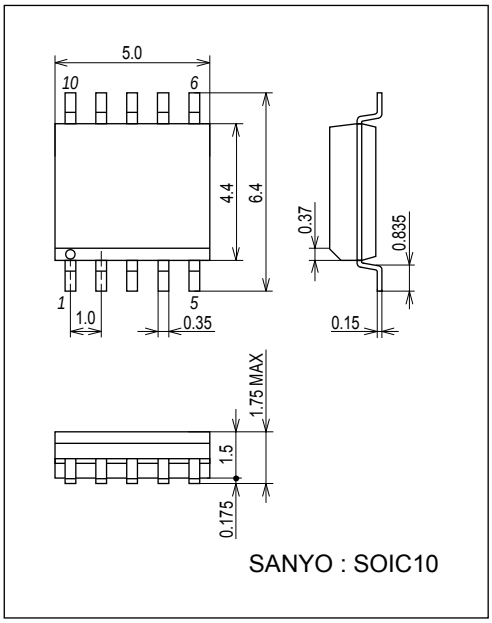
Operating Characteristics at Ta = 25°C, V_{CC} = 3.0V, f_C = 10.7MHz

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current drain	I_{CCO}	No input	3.0	4.0	5.0	mA
Demodulator output	V_O	100dBμV, 100% mod., fm = 1kHz	70	150	220	mV
Total harmonic distortion	THD	100dBμV, 100% mod., fm = 1kHz		0.5	0.8	%
Signal-to-noise ratio	S/N	100dBμV, 100% mod., fm = 1kHz	65	73		dB
3dB sensitivity	-3dBL.S	100dBμV, 100% mod., fm = 1kHz output reference, when the input is -3dB	19	28	37	dBμV
SD sensitivity	SD_{ON}	0% mod.	35	50	65	dBμV
IF counter buffer output	V_{IFBuff}	100dBμV	90	130	170	mV

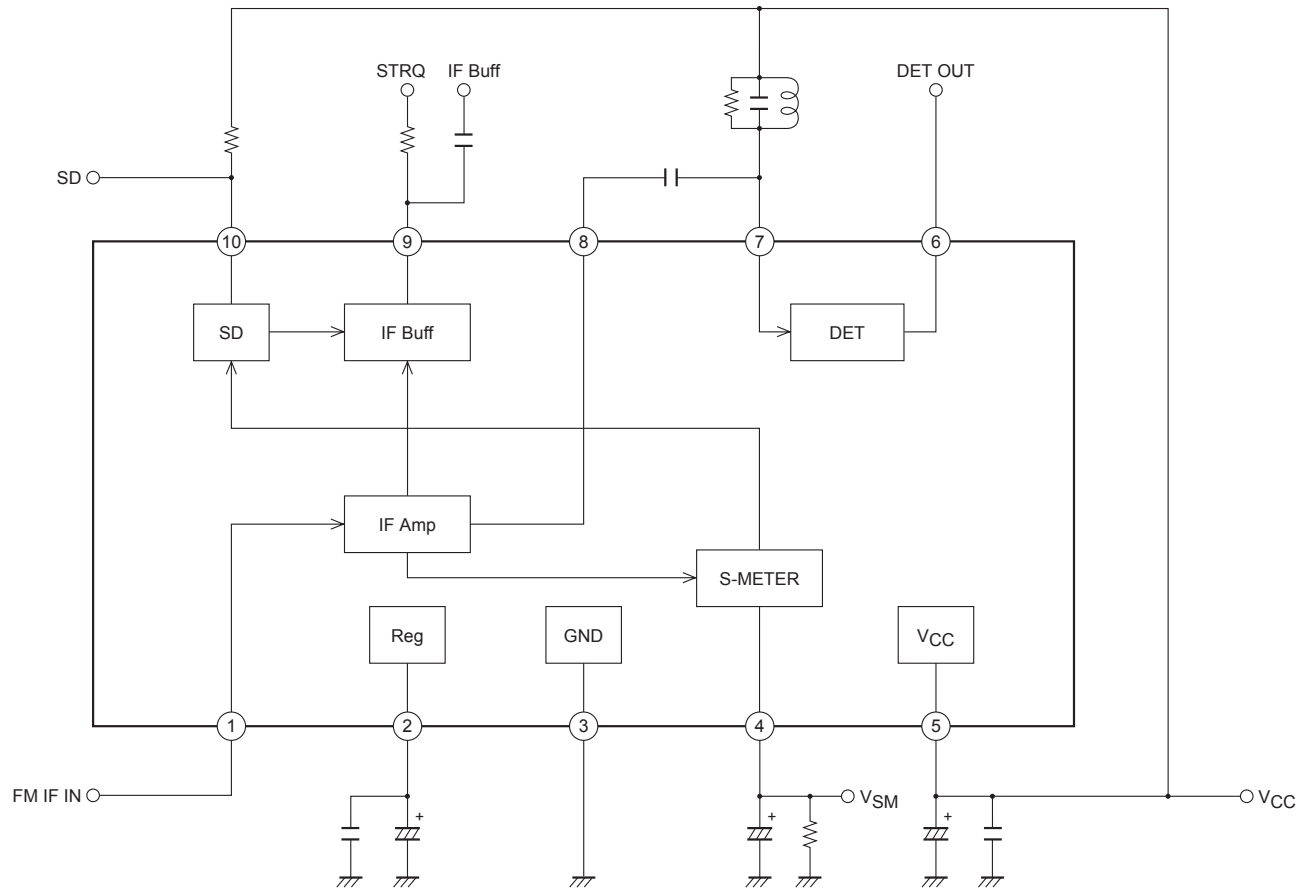
Package Dimensions

Unit : mm

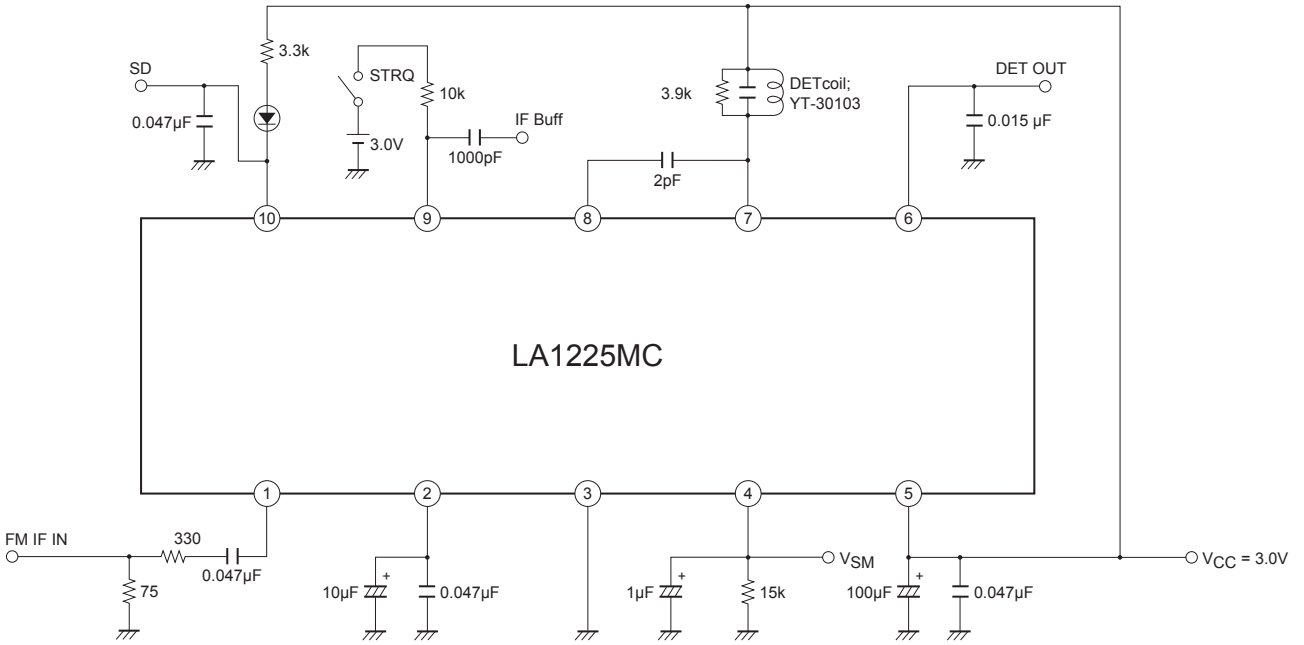
3426



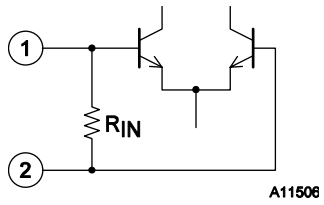
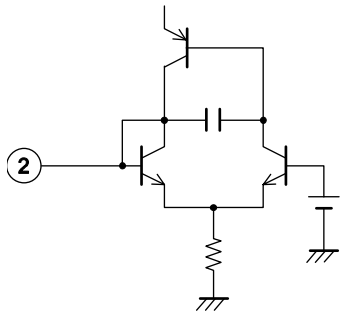
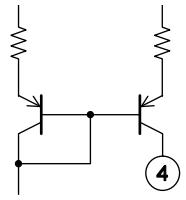
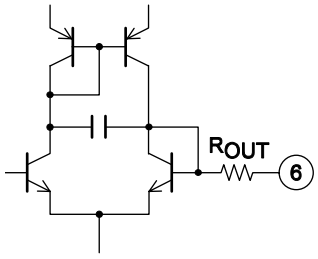
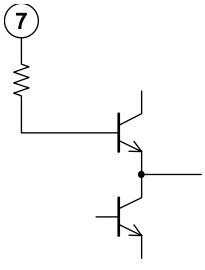
Block Diagram and Test Circuit



Sample Application Circuit

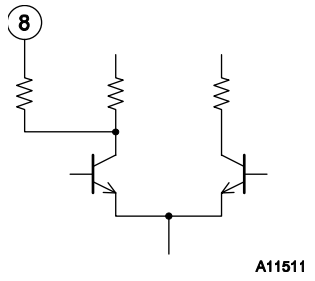
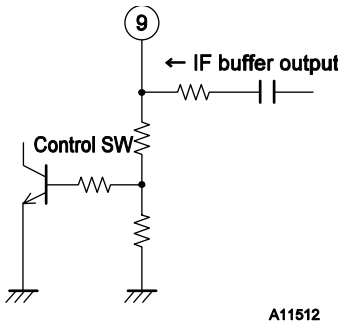
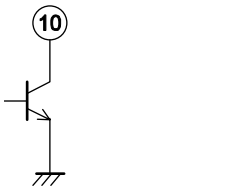


Pin Functions No-Signal Voltage at V_{CC} = 3.0V

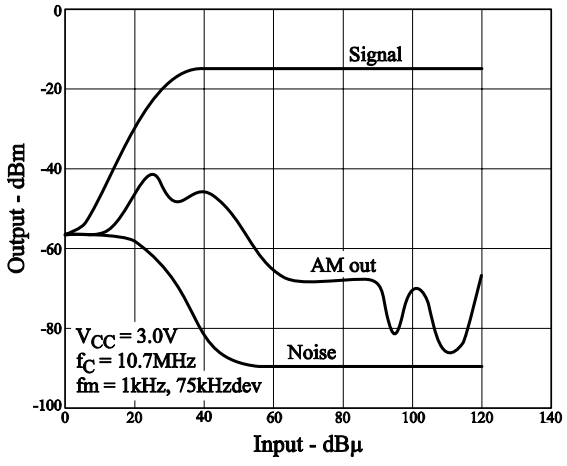
Pin No.	Function	No-signal voltage (V)	Equivalent circuit	Notes
1	IF input	1.2		Input impedance R_{IN} = 330Ω
2	Reg	1.2		Vreg = 1.2V
3	GND	0		
4	S-meter output	0.1		Open collector output. The SD sensitivity can be adjusted with an external resistor connected to this pin.
5	V_{CC}	3.0		
6	Demodulated output	1.5		Output impedance R_{OUT} = 3kΩ
7	DET	3.0		The detector coil is inserted between pin 7 and pin 5 (V_{CC}).

Continued on next page.

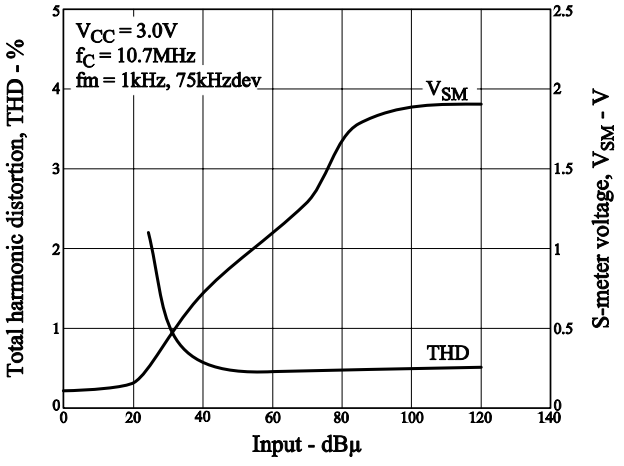
Continued from preceding page.

Pin No.	Function	No-signal voltage (V)	Equivalent circuit	Notes
8	Limiter amplifier output	2.8		Pin 8 and pin 7 (DET) are connected through a capacitor.
9	IF buffer (Also used for control SW)	0		The IF buffer output is turned on when the voltage applied to the pin is the recommended 1.5V or higher.
10	SD	1.6		This is an active-low output. This is an open-collector output and can directly drive an LED. ($I_C$max = 20mA)

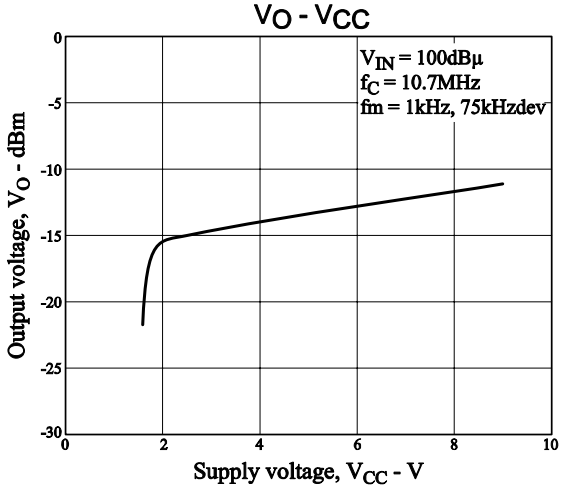
I/O Characteristics



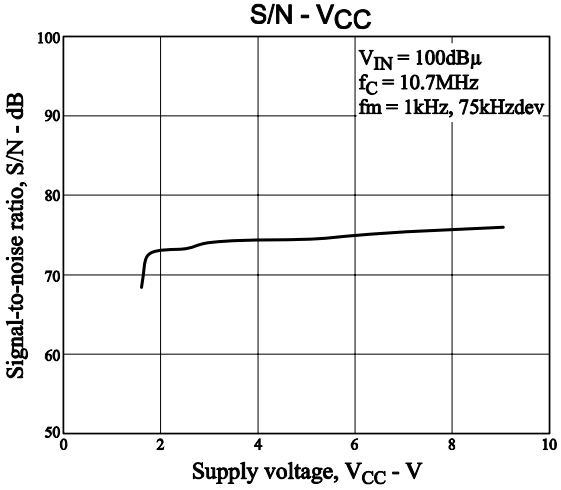
I/O Characteristics



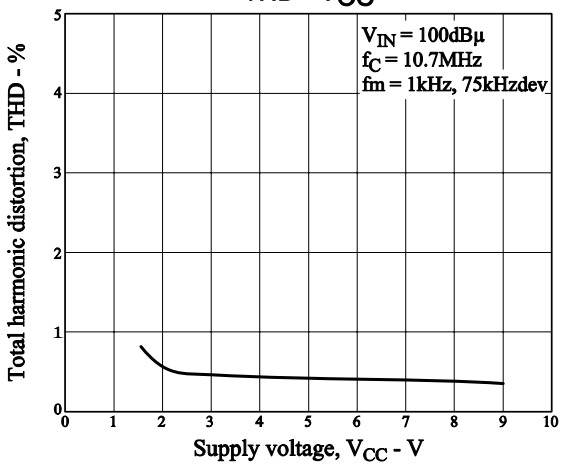
V_O - V_{CC}



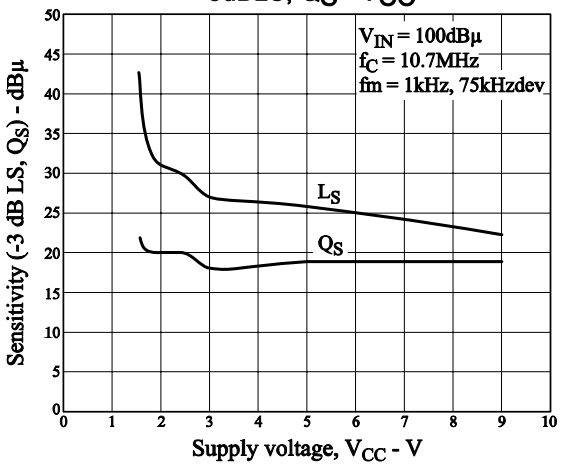
S/N - V_{CC}



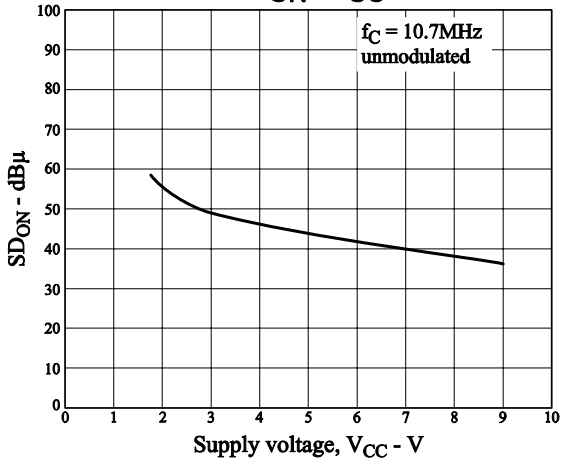
THD - V_{CC}



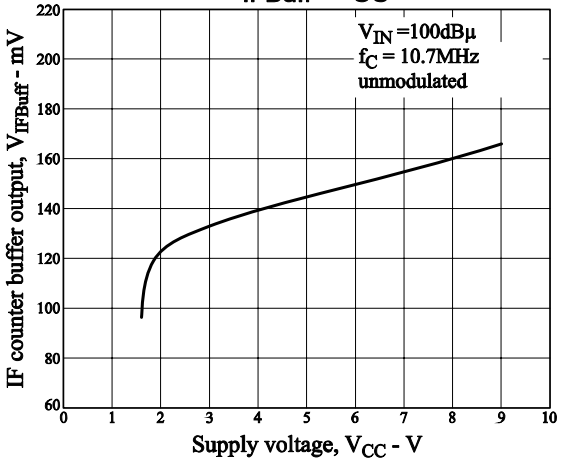
-3dBLS, Q_S - V_{CC}

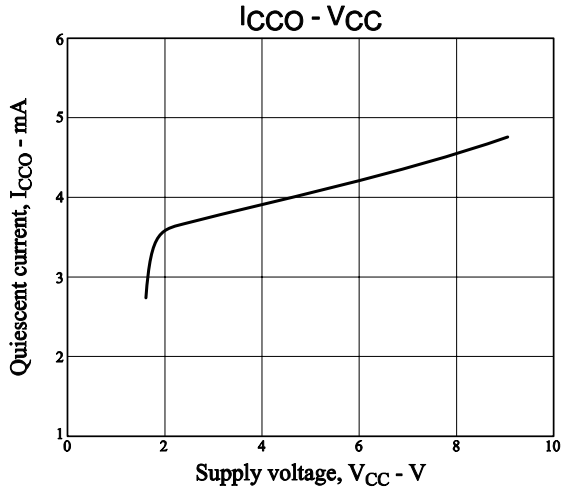


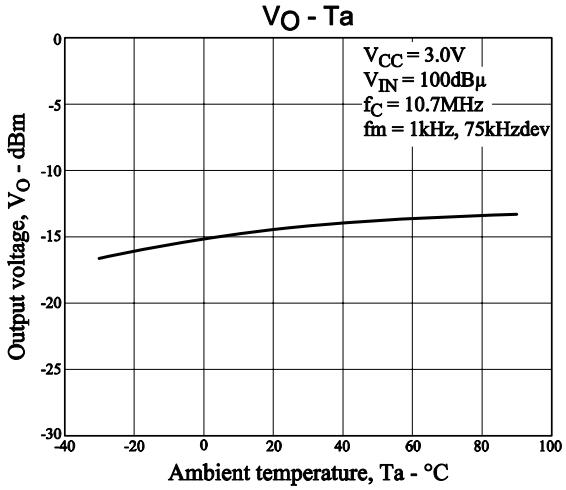
SD_{ON} - V_{CC}

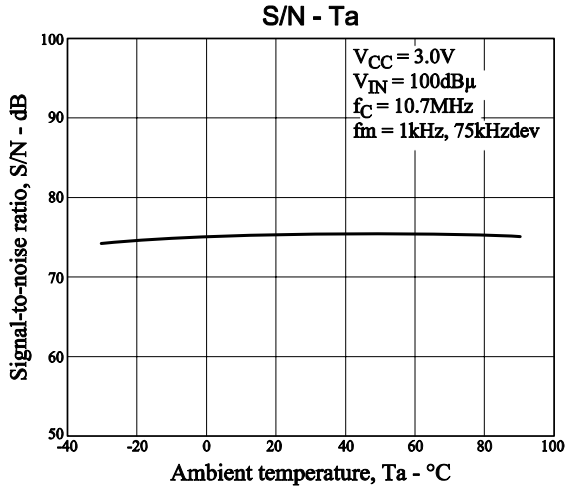


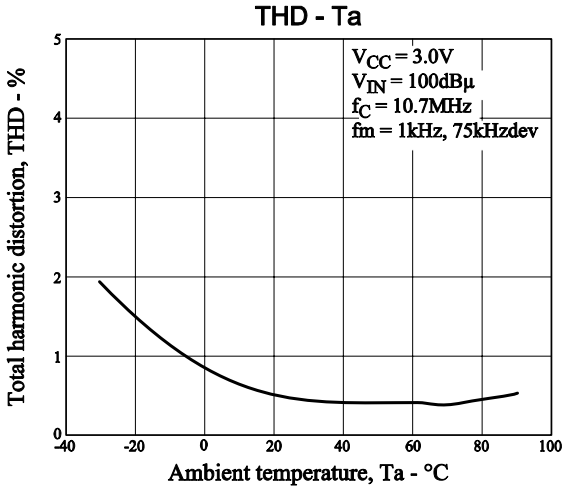
V_{IFBuff} - V_{CC}

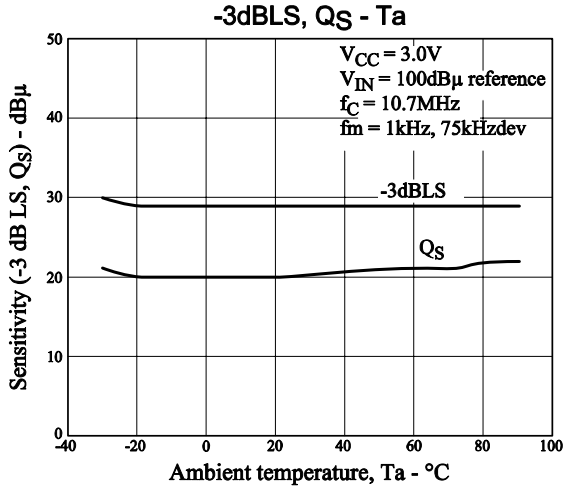


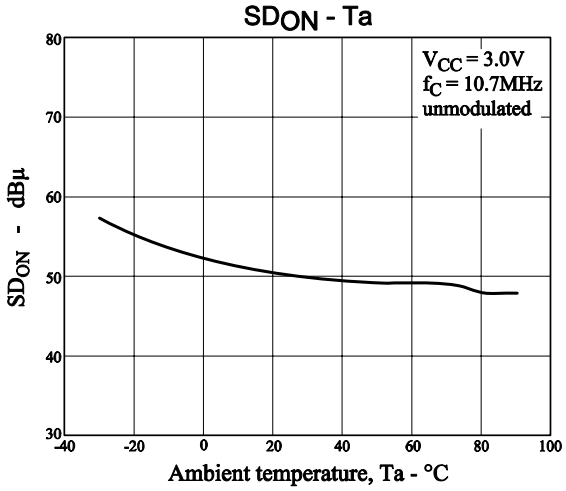

ICCO - VCC
Quiescent current, ICCO - mA
Supply voltage, VCC - V

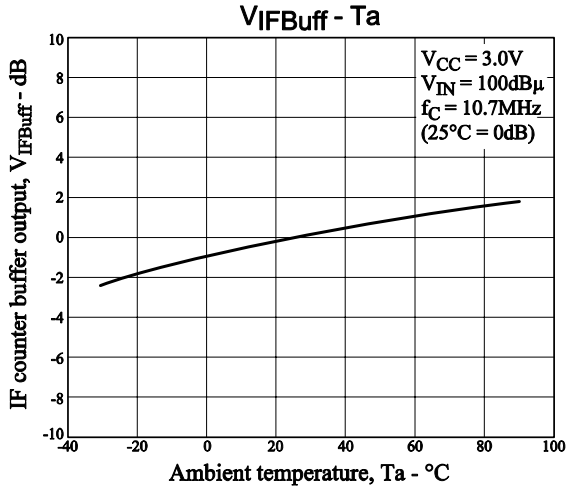

VO - Ta
VCC = 3.0V
VIN = 100dBμ
fC = 10.7MHz
fm = 1kHz, 75kHzdev
Output voltage, VO - dBm
Ambient temperature, Ta - °C

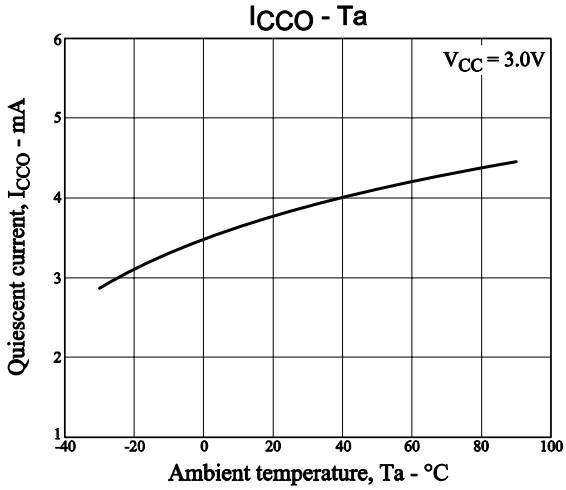

S/N - Ta
VCC = 3.0V
VIN = 100dBμ
fC = 10.7MHz
fm = 1kHz, 75kHzdev
Signal-to-noise ratio, S/N - dB
Ambient temperature, Ta - °C


THD - Ta
VCC = 3.0V
VIN = 100dBμ
fC = 10.7MHz
fm = 1kHz, 75kHzdev
Total harmonic distortion, THD - %
Ambient temperature, Ta - °C


-3dBLS, QS - Ta
VCC = 3.0V
VIN = 100dBμ reference
fC = 10.7MHz
fm = 1kHz, 75kHzdev
-3dBLS
QS
Sensitivity (-3 dB LS, QS) - dBμ
Ambient temperature, Ta - °C


SDON - Ta
VCC = 3.0V
fC = 10.7MHz
unmodulated
SDON - dBμ
Ambient temperature, Ta - °C


VIFBuff - Ta
VCC = 3.0V
VIN = 100dBμ
fC = 10.7MHz
(25°C = 0dB)
IF counter buffer output, VIFBuff - dB
Ambient temperature, Ta - °C


ICCO - Ta
VCC = 3.0V
Quiescent current, ICCO - mA
Ambient temperature, Ta - °C