



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

## LA1225MC — Monolithic Linear IC 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 $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC \text{ max}}$		9.0	V
Allowable power dissipation	$P_d \text{ max}$	$T_a \leq 85^\circ\text{C}$	100	mW
Operating temperature	$T_{opr}$		-20 to +85	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

#### Operating Conditions at $T_a = 25^\circ\text{C}$

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

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# LA1225MC

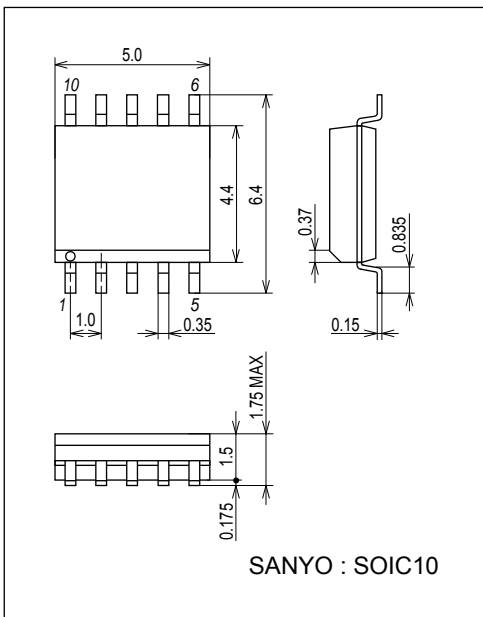
**Operating Characteristics** at  $T_a = 25^\circ\text{C}$ ,  $V_{CC} = 3.0\text{V}$ ,  $f_C = 10.7\text{MHz}$

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

## Package Dimensions

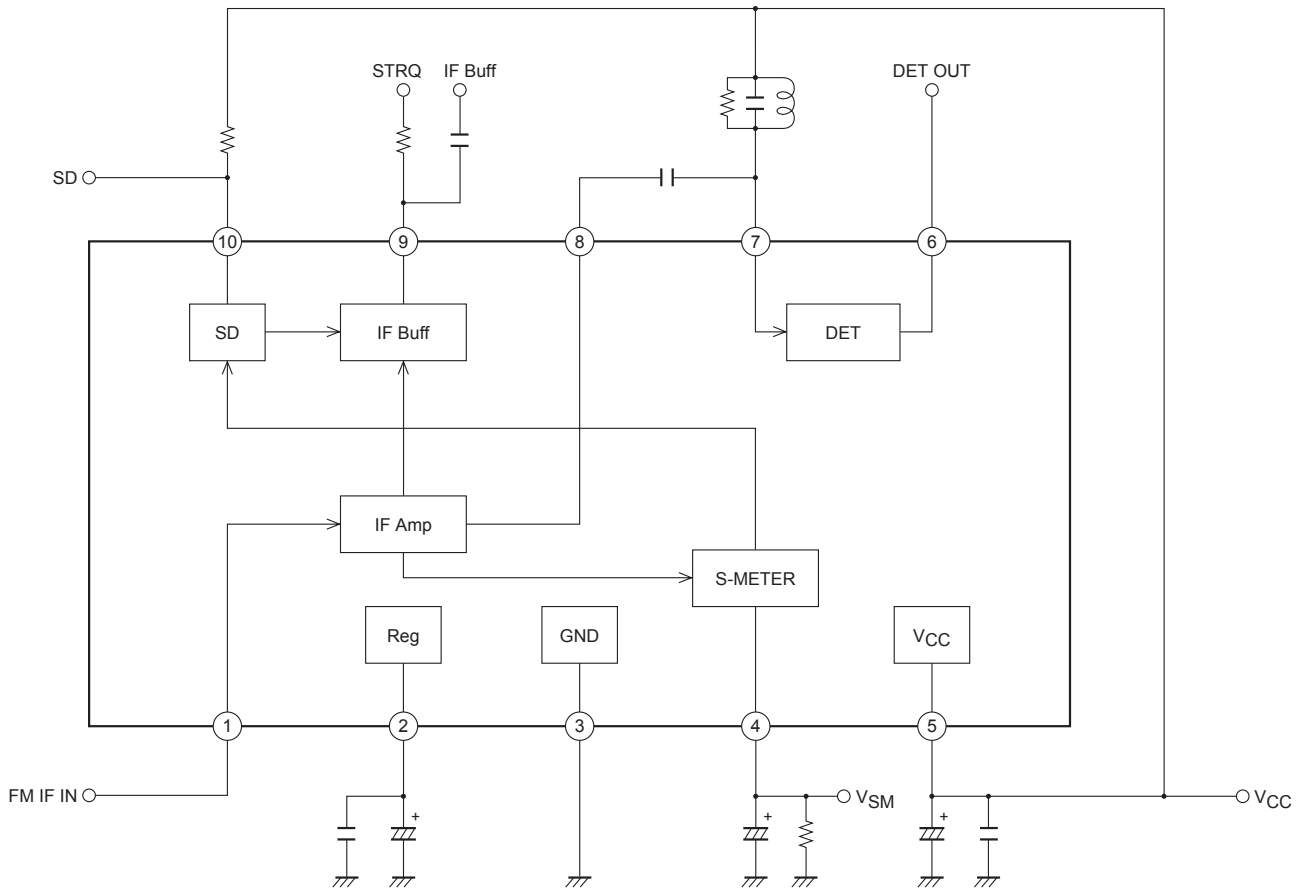
Unit : mm

3426

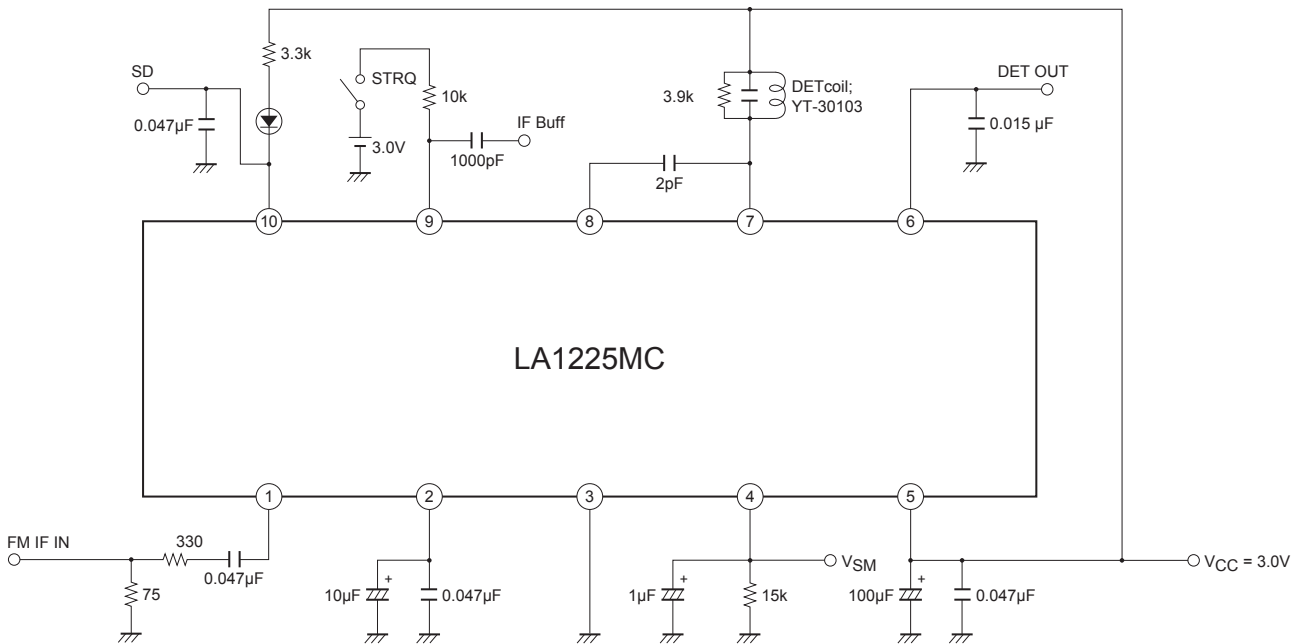


# LA1225MC

## Block Diagram and Test Circuit

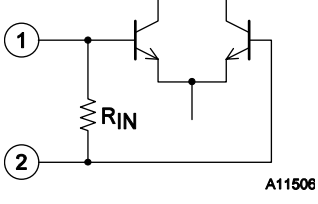
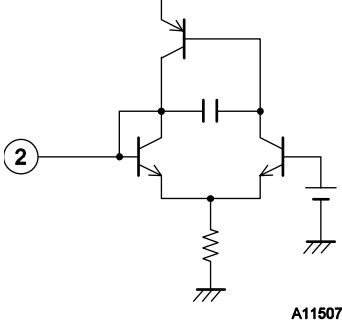
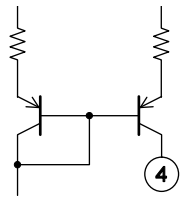
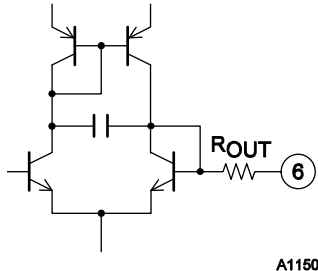
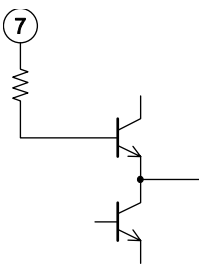


## Sample Application Circuit



# LA1225MC

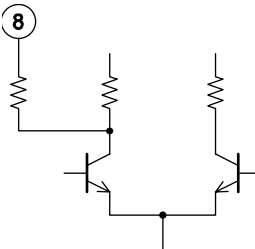
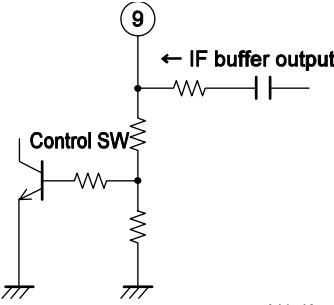
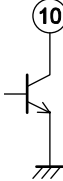
## Pin Functions No-Signal Voltage at $V_{CC} = 3.0V$

Pin No.	Function	No-signal voltage (V)	Equivalent circuit	Notes
1	IF input	1.2		Input impedance $R_{IN} = 330\Omega$
2	Reg	1.2		$V_{reg} = 1.2V$
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 $R_{OUT} = 3k\Omega$
7	DET	3.0		The detector coil is inserted between pin 7 and pin 5 ( $V_{CC}$ ).

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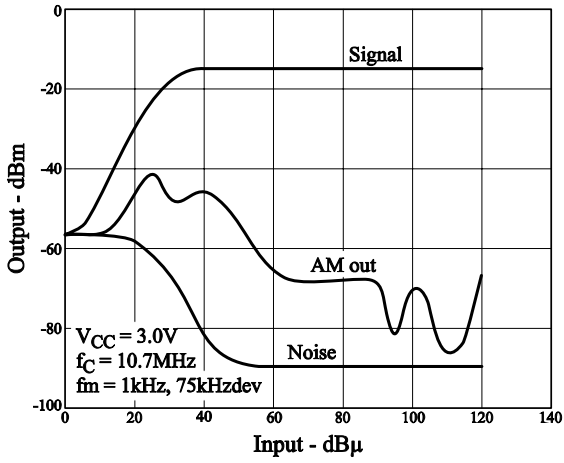
# LA1225MC

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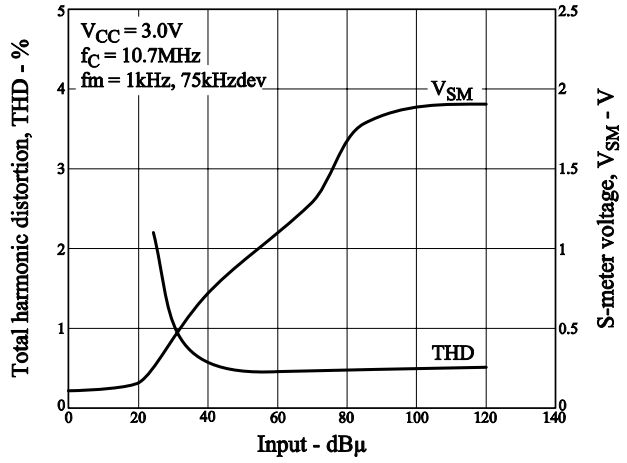
Pin No.	Function	No-signal voltage (V)	Equivalent circuit	Notes
8	Limiter amplifier output	2.8	 <p style="text-align: right;">A11511</p>	Pin 8 and pin 7 (DET) are connected through a capacitor.
9	IF buffer (Also used for control SW)	0	 <p style="text-align: right;">A11512</p>	The IF buffer output is turned on when the voltage applied to the pin is the recommended 1.5V or higher.
10	SD	1.6	 <p style="text-align: right;">A11513</p>	This is an active-low output. This is an open-collector output and can directly drive an LED. ( $I_{Cmax} = 20mA$ )

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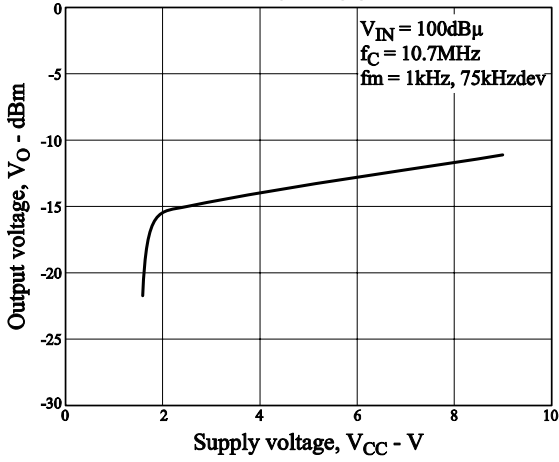
I/O Characteristics



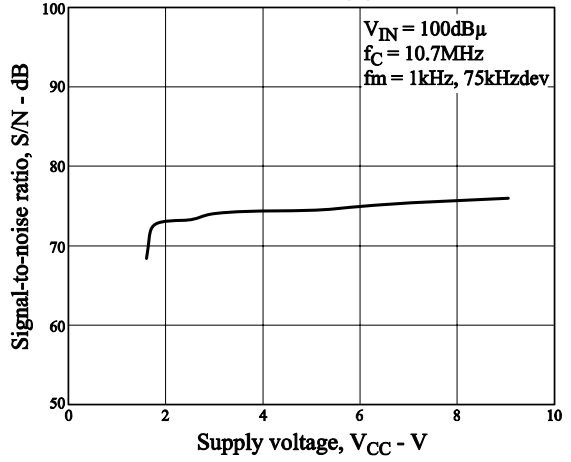
I/O Characteristics



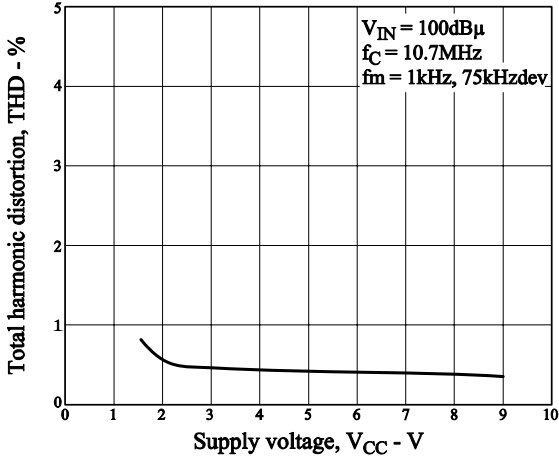
$V_O - V_{CC}$



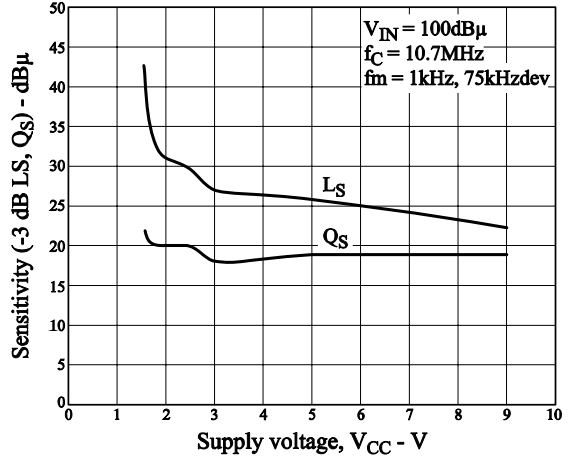
S/N - VCC



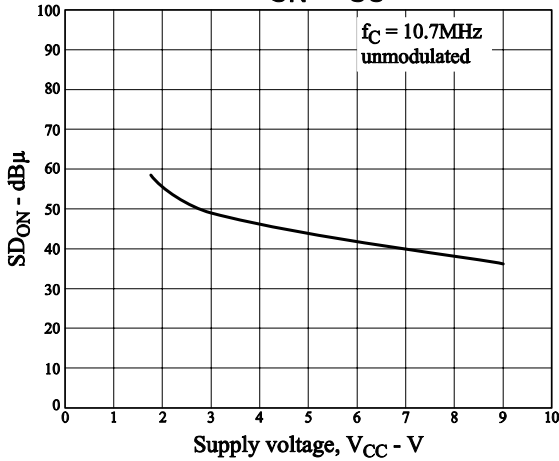
THD - VCC



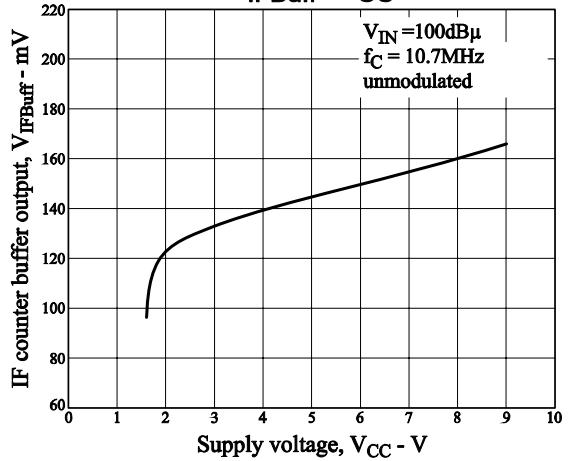
-3dBLS, QS - VCC



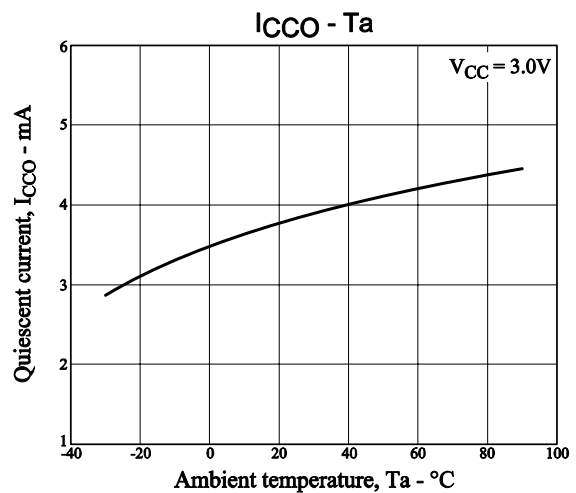
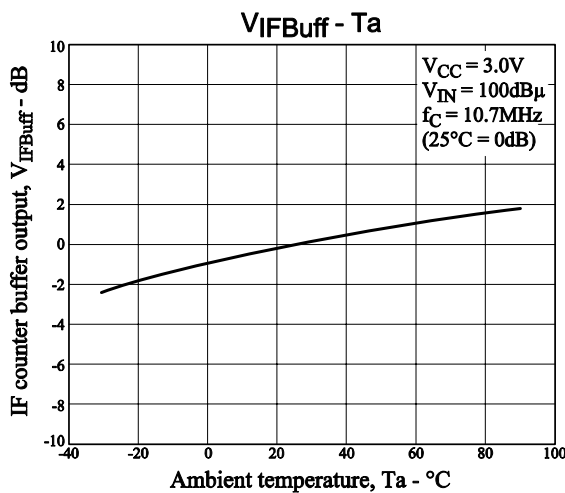
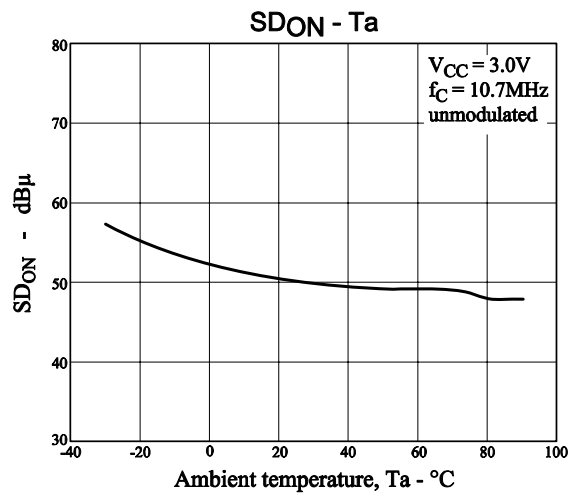
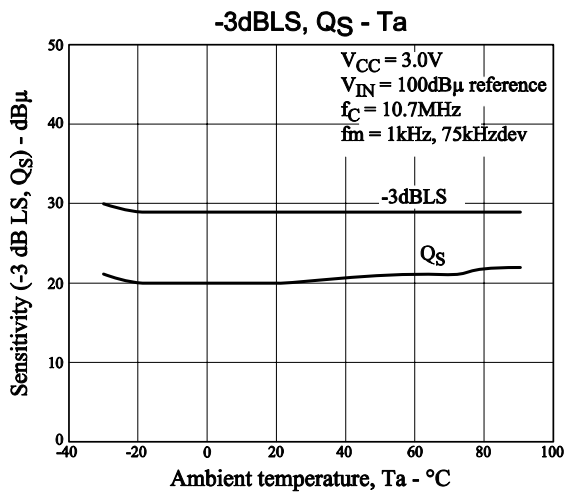
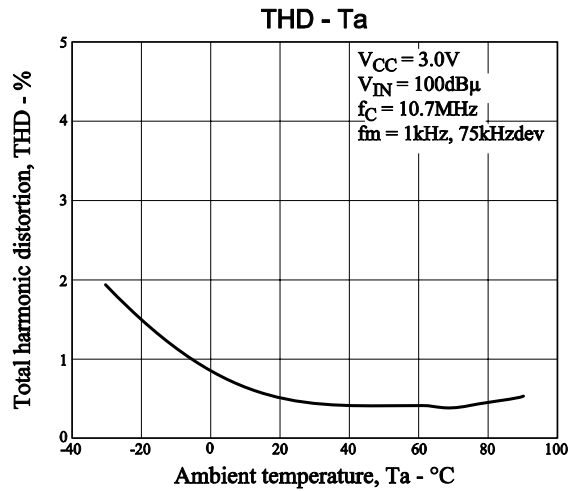
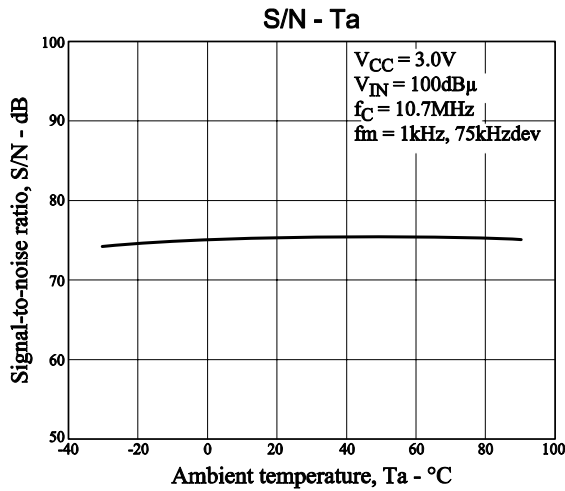
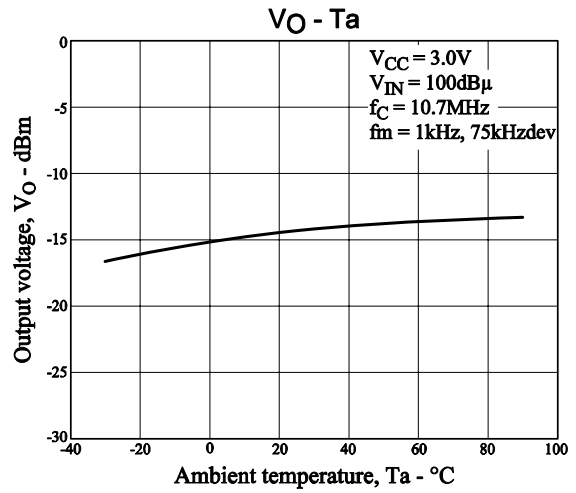
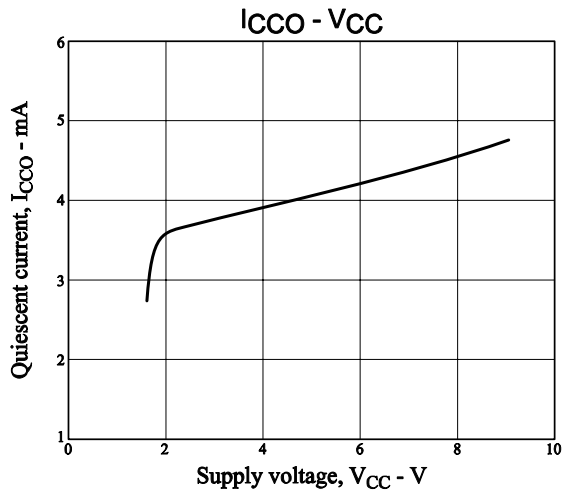
SDON - VCC



VIFBuff - VCC



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