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# 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 Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V <sub>CC</sub> max		9.0	V
Allowable power dissipation	P <sub>d</sub> max	Ta ≤ 85°C	100	mW
Operating temperature	T <sub>opr</sub>		-20 to +85	°C
Storage temperature	T <sub>stg</sub>		-55 to +150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

#### Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V <sub>CC</sub>		3.0	V
Operating supply voltage range	V <sub>CC</sub> op		1.8 to 8.0	V

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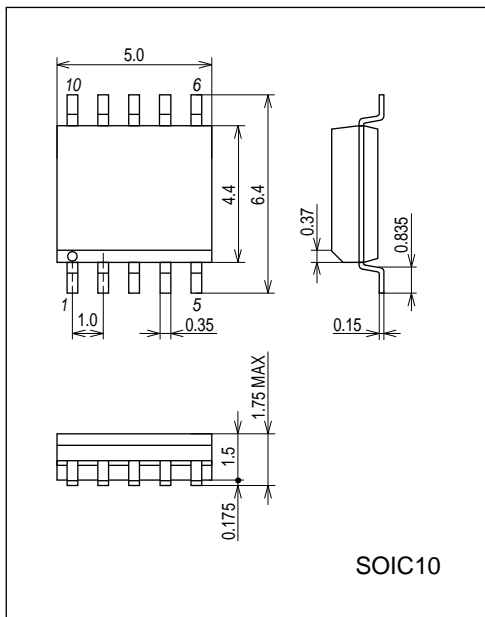
**Operating Characteristics** at  $T_a = 25^\circ\text{C}$ ,  $V_{CC} = 3.0\text{V}$ ,  $f_C = 10.7\text{MHz}$

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

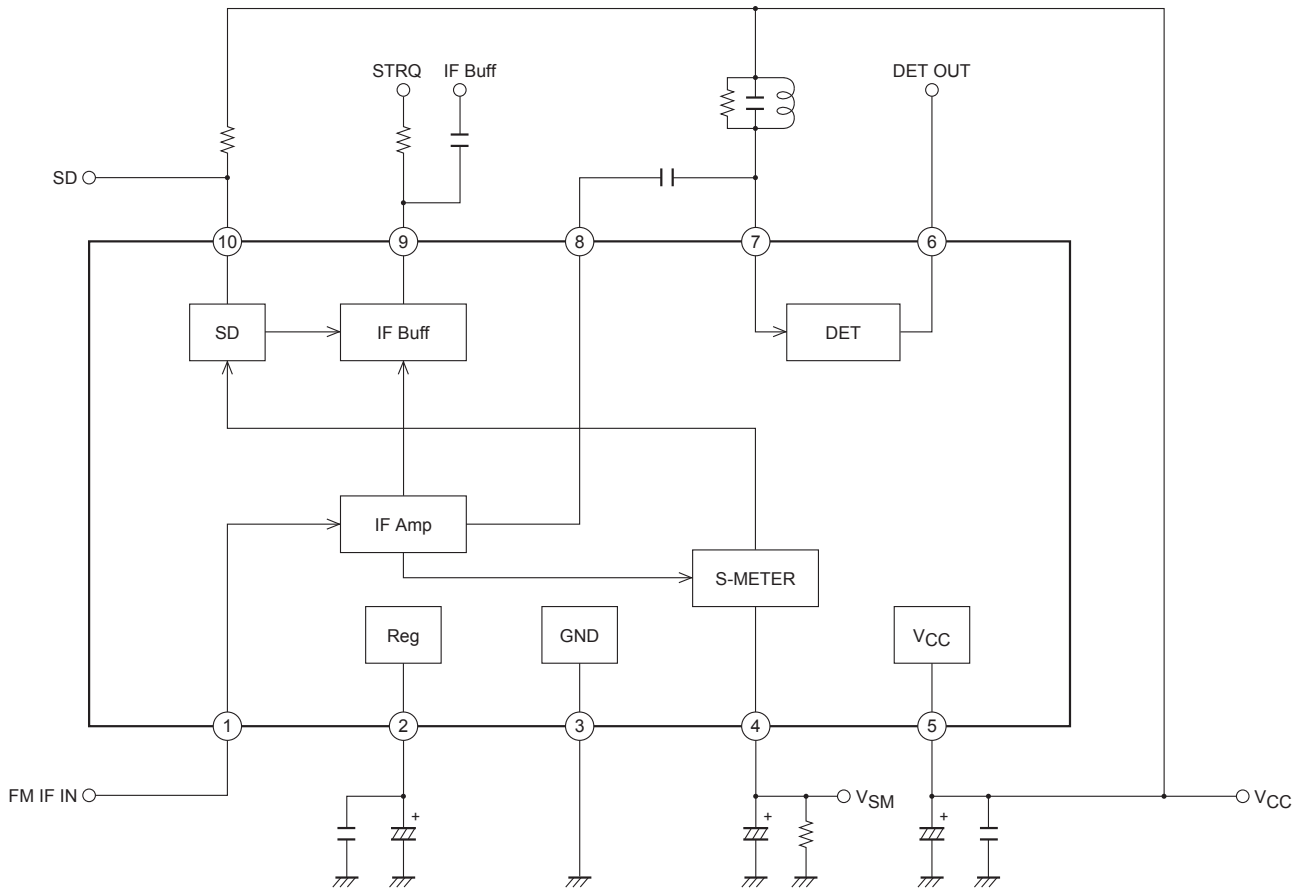
Unit : mm

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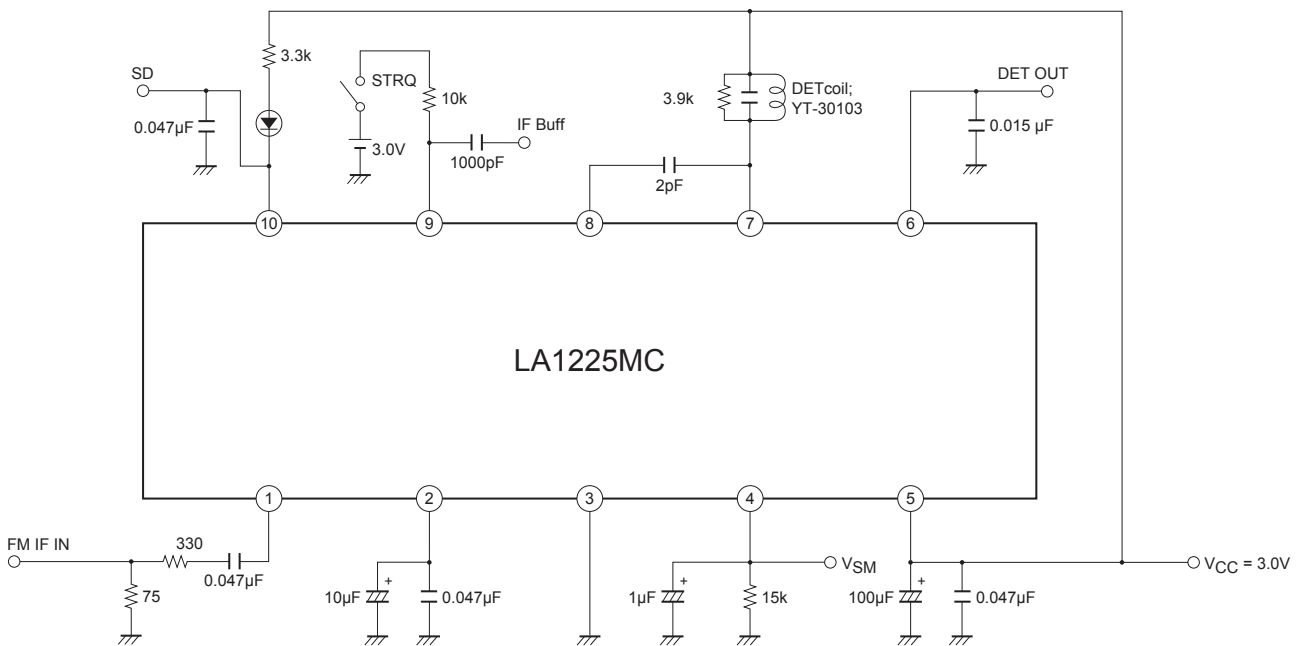


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## Block Diagram and Test Circuit

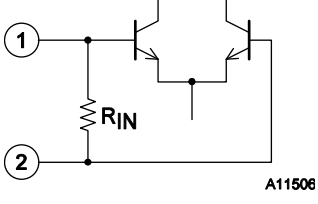
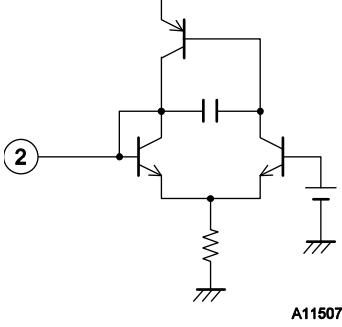
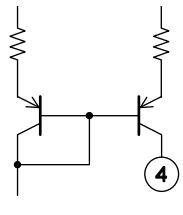
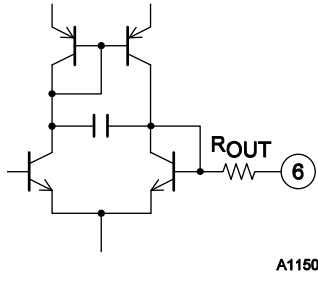
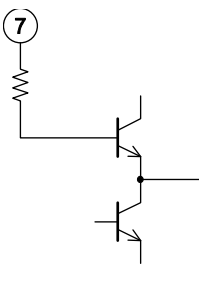


## Sample Application Circuit



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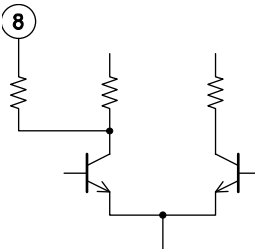
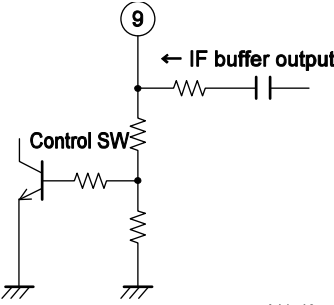
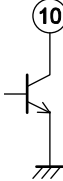
## Pin Functions No-Signal Voltage at V<sub>CC</sub> = 3.0V

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 <sub>CC</sub>	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 <sub>CC</sub> ).

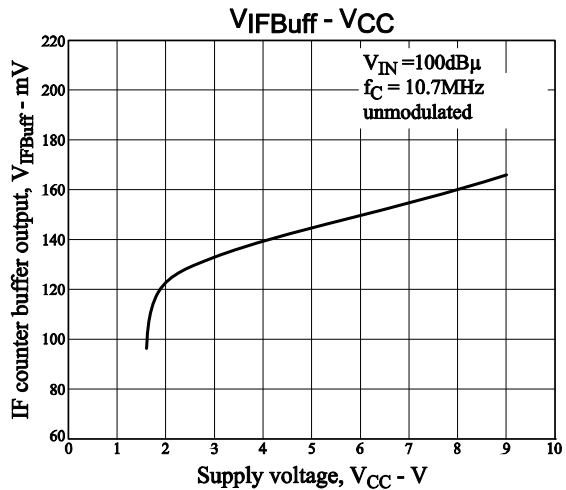
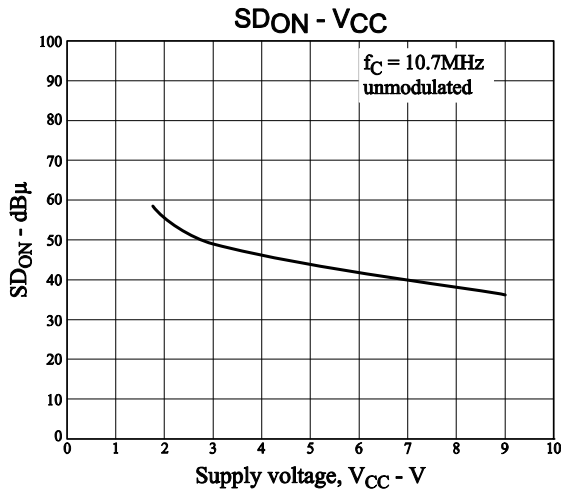
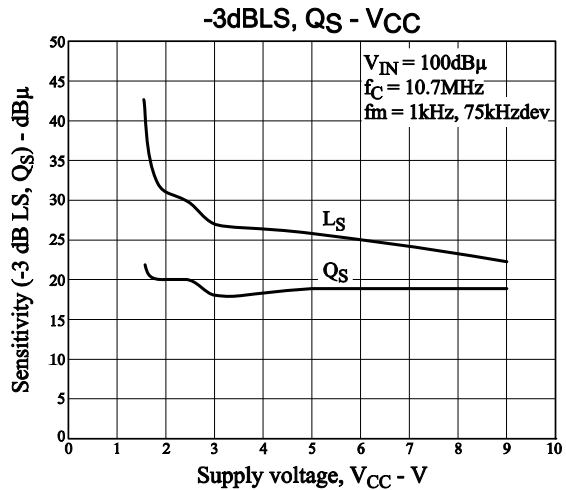
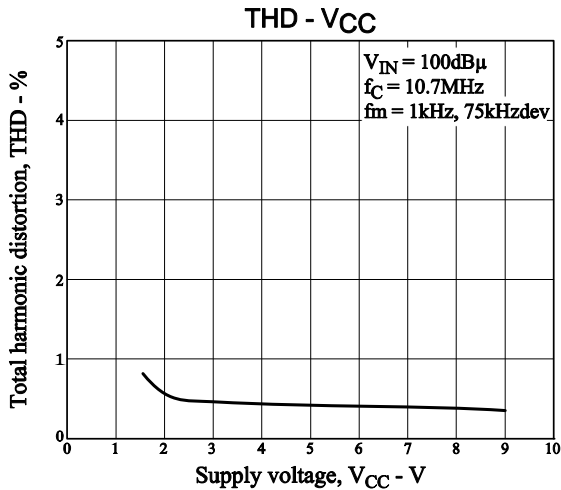
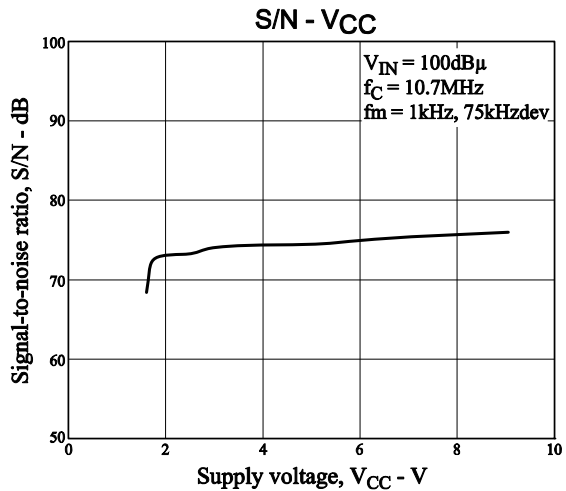
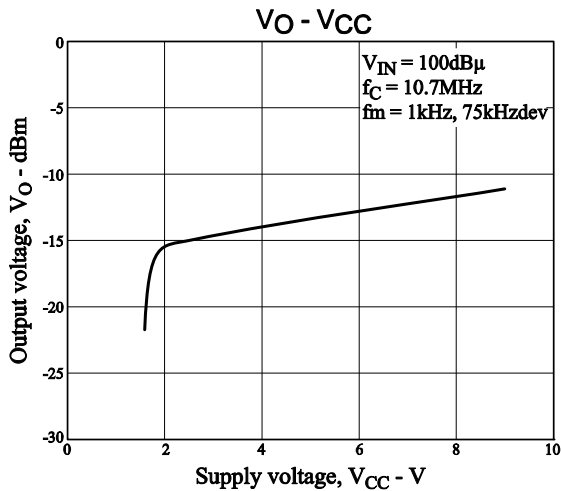
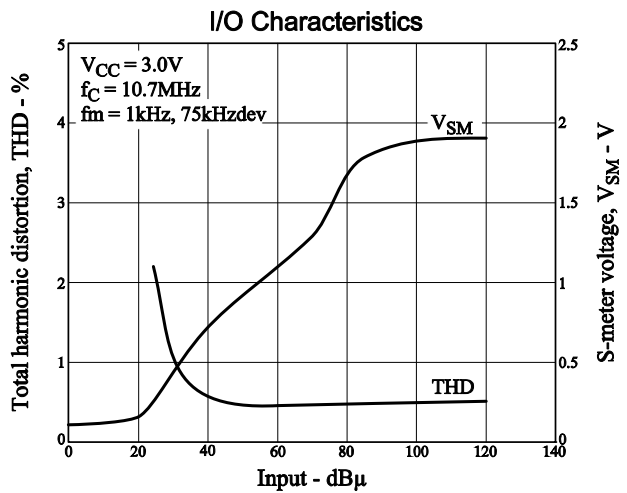
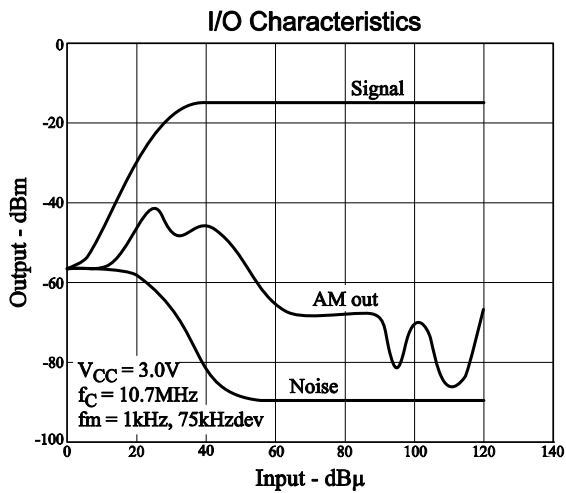
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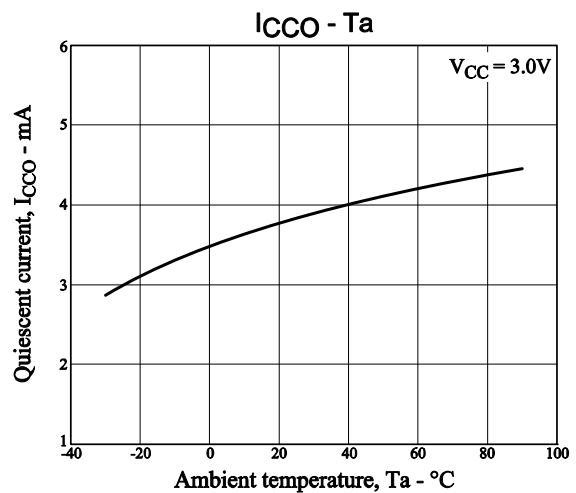
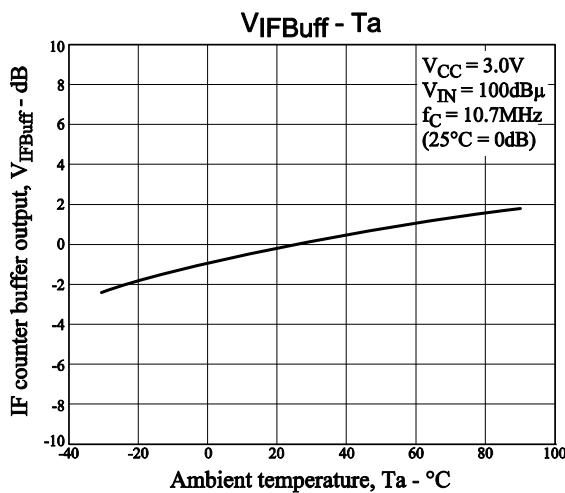
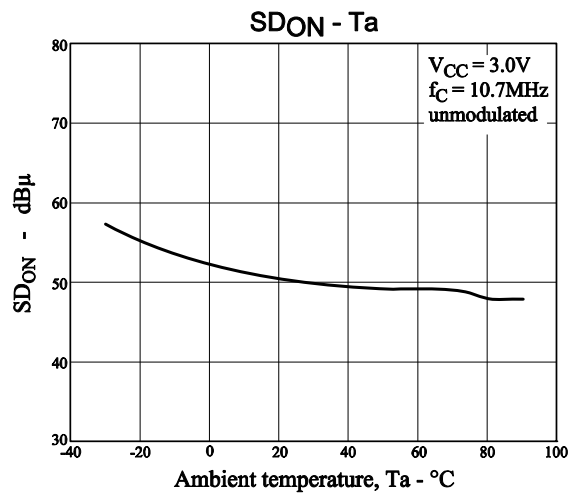
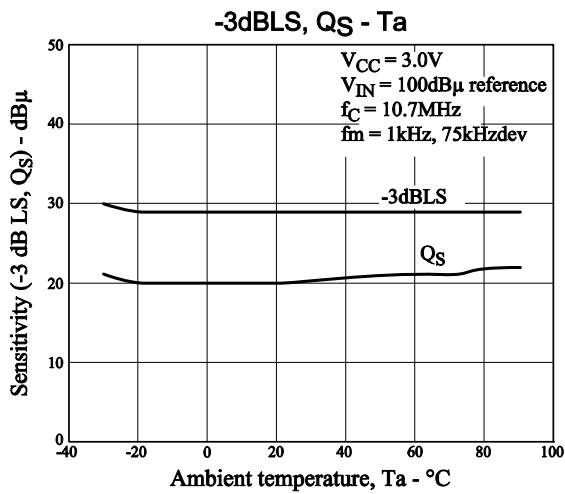
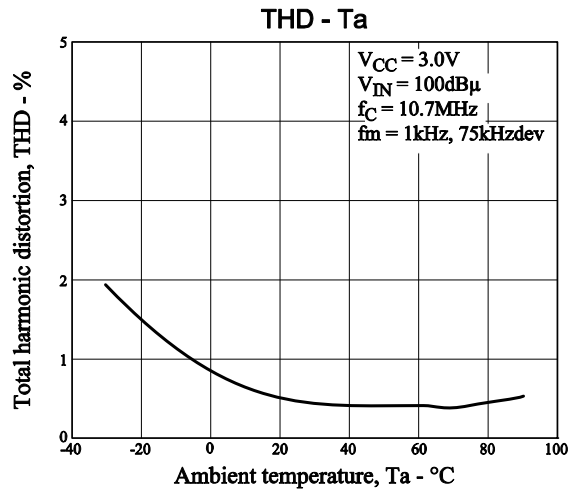
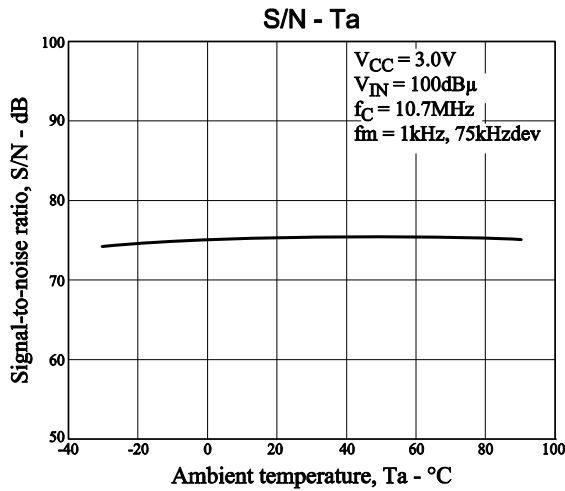
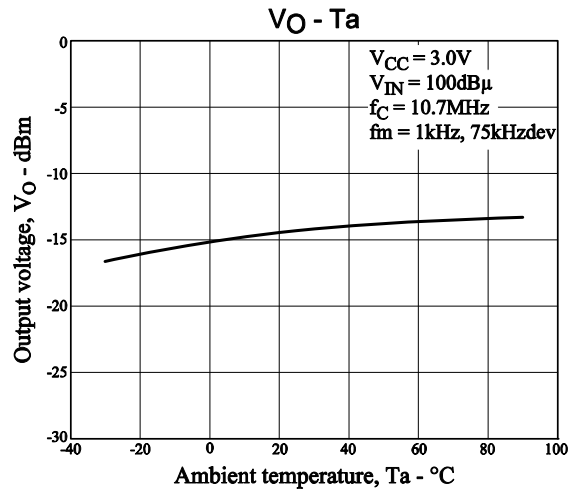
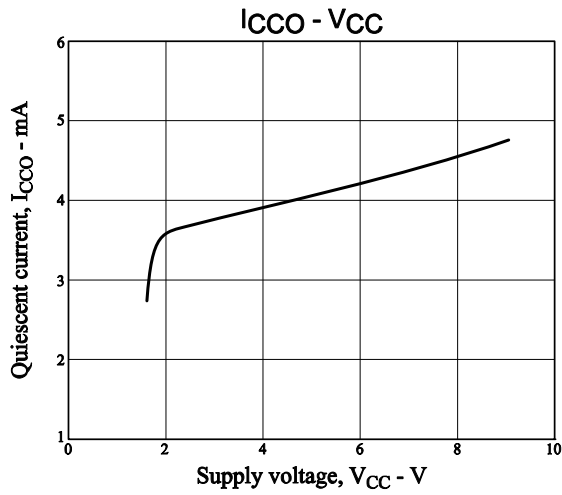
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Pin No.	Function	No-signal voltage (V)	Equivalent circuit	Notes
8	Limiter amplifier output	2.8	 <p style="text-align: right;">A11511</p>	Pin 8 and pin 7 (DET) are connected through a capacitor.
9	IF buffer (Also used for control SW)	0	 <p style="text-align: 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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