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ON Semiconductor®

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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 _{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

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 _{CC}		3.0	V
Operating supply voltage range	V _{CC} op		1.8 to 8.0	V

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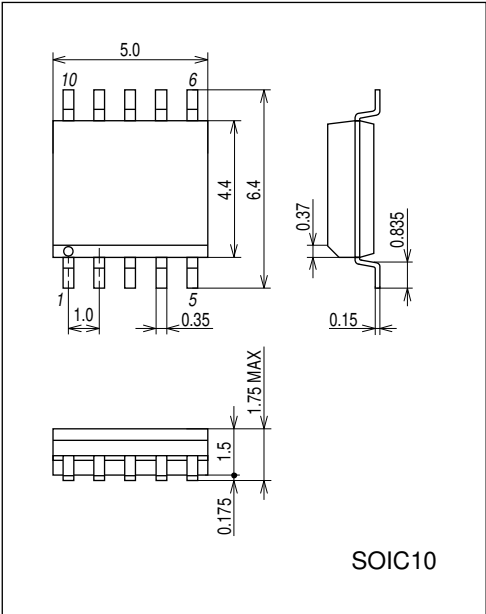
Operating Characteristics at $T_a = 25^{\circ}\text{C}$, $V_{CC} = 3.0\text{V}$, $f_C = 10.7\text{MHz}$

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 μV , 100% mod., $f_m = 1\text{kHz}$	70	150	220	mV
Total harmonic distortion	THD	100dB μV , 100% mod., $f_m = 1\text{kHz}$		0.5	0.8	%
Signal-to-noise ratio	S/N	100dB μV , 100% mod., $f_m = 1\text{kHz}$	65	73		dB
3dB sensitivity	-3dBL.S	100dB μV , 100% mod., $f_m = 1\text{kHz}$ output reference, when the input is -3dB	19	28	37	dB μV
SD sensitivity	SD_{ON}	0% mod.	35	50	65	dB μV
IF counter buffer output	V_{IFBuff}	100dB μV	90	130	170	mV

Package Dimensions

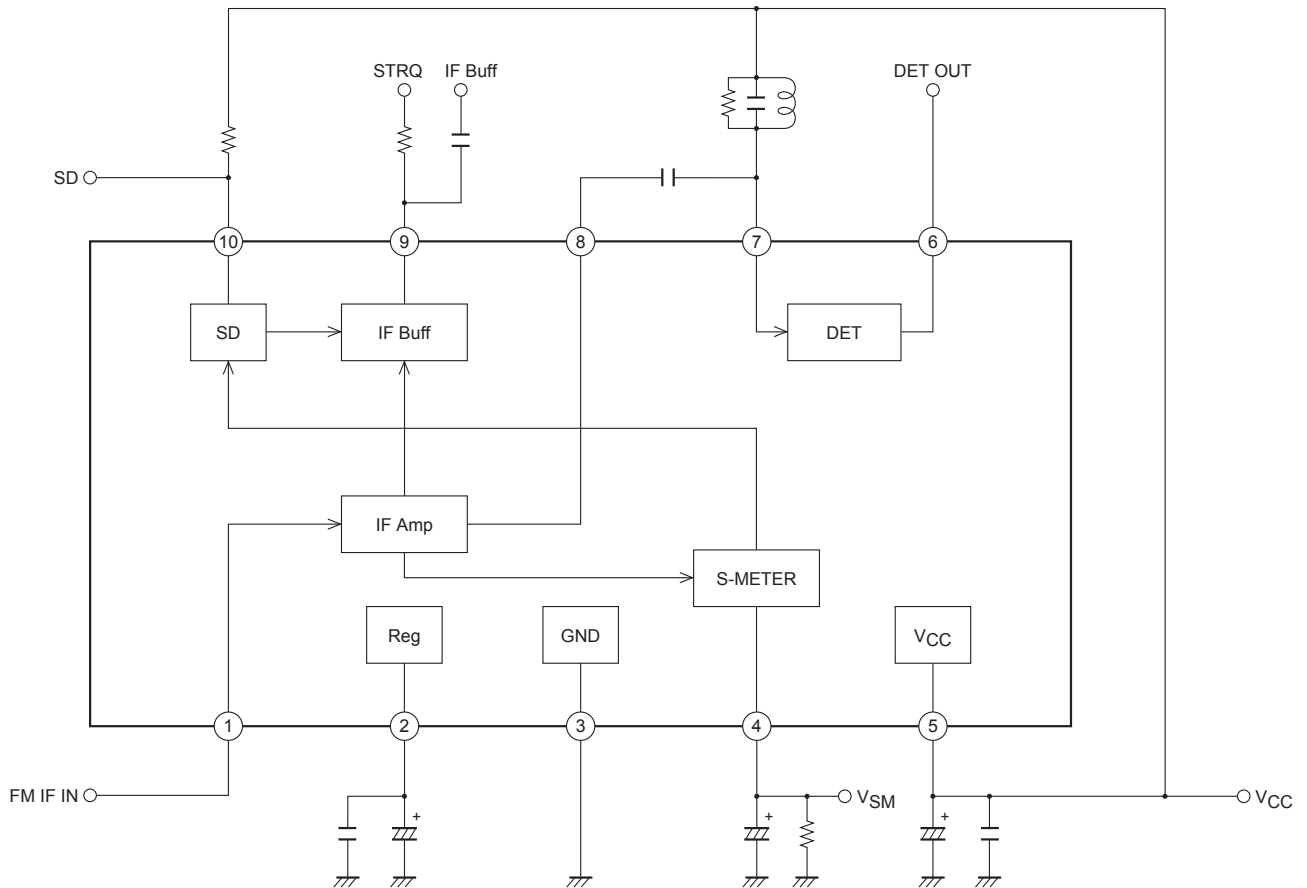
Unit : mm

3426

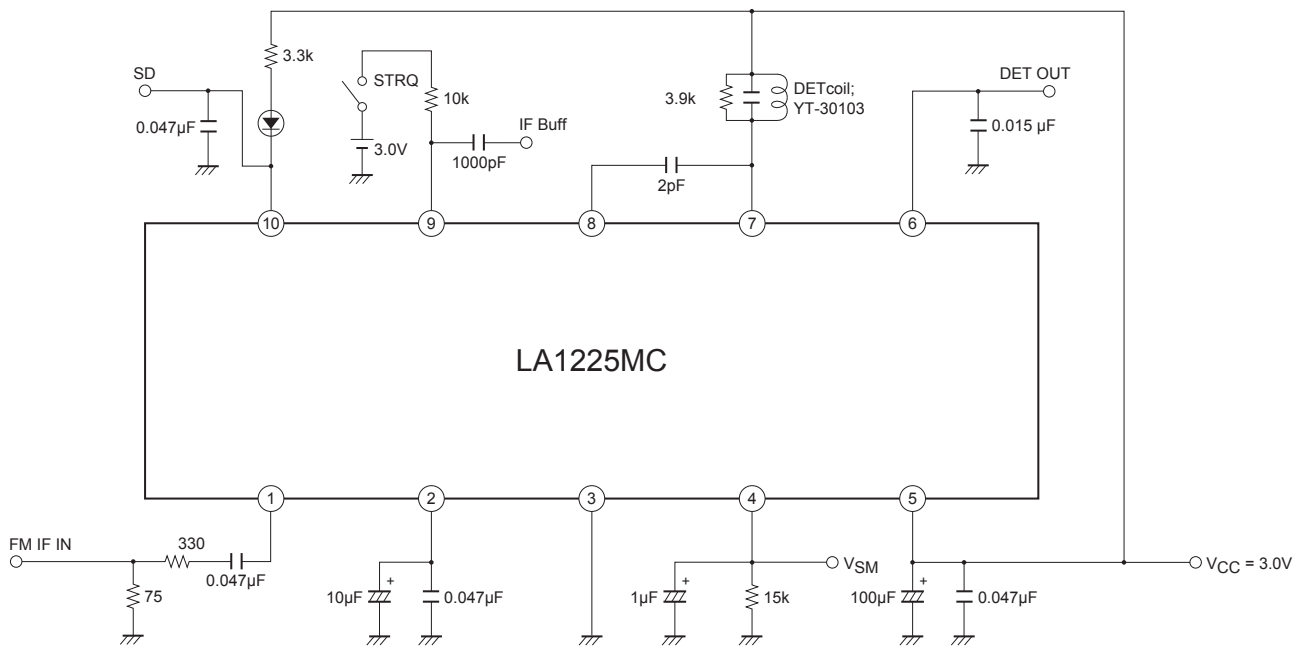


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Block Diagram and Test Circuit

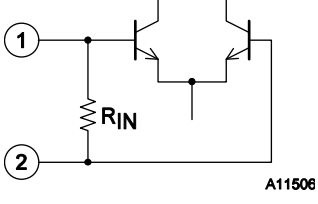
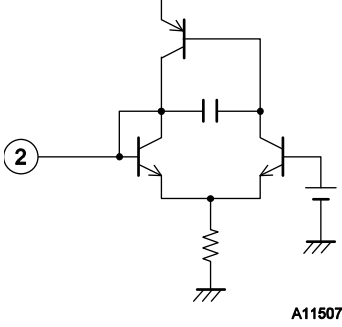
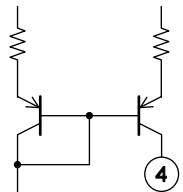
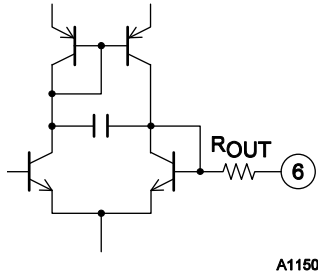
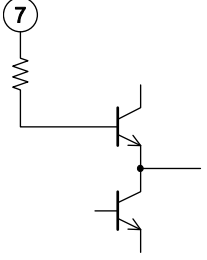


Sample Application Circuit



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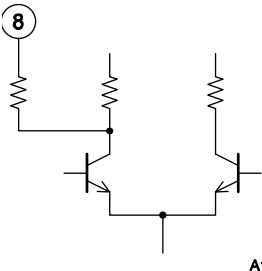
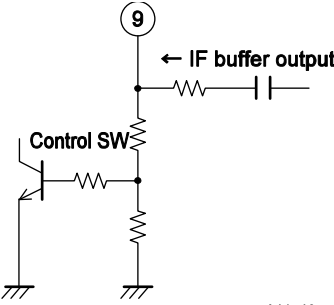
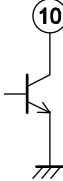
Pin Functions No-Signal Voltage at $V_{CC} = 3.0V$

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}).

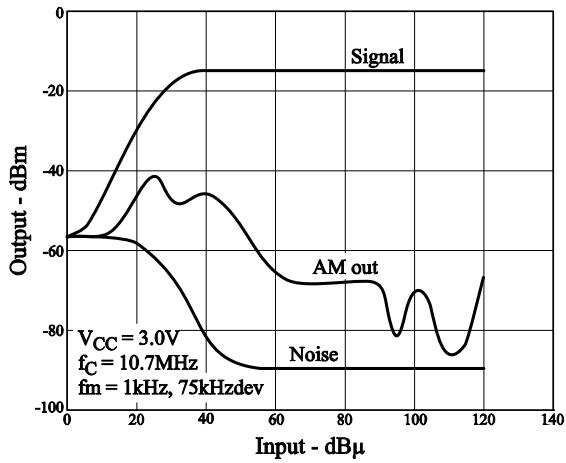
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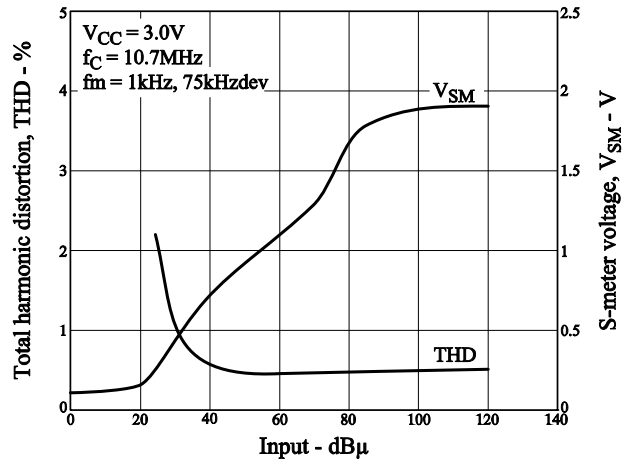
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Pin No.	Function	No-signal voltage (V)	Equivalent circuit	Notes
8	Limiter amplifier output	2.8	 A11511	Pin 8 and pin 7 (DET) are connected through a capacitor.
9	IF buffer (Also used for control SW)	0	 A11512	The IF buffer output is turned on when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

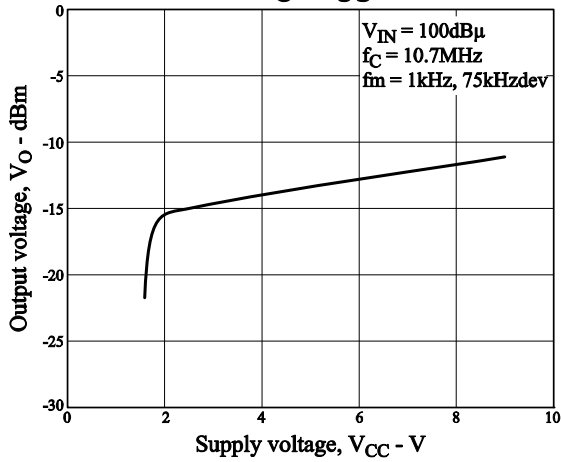
I/O Characteristics



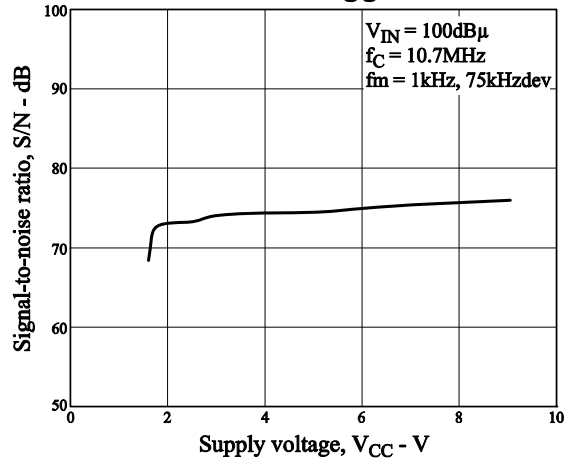
I/O Characteristics



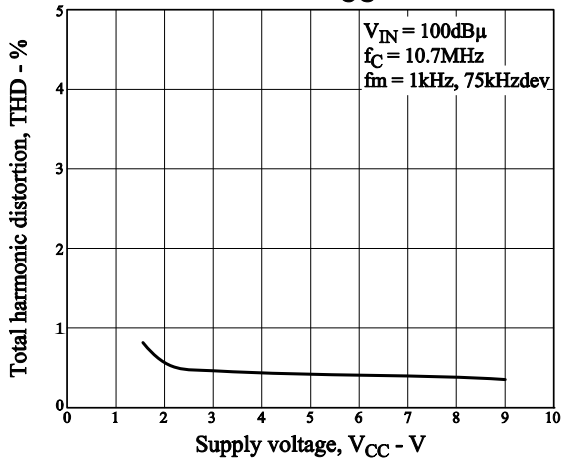
$V_O - V_{CC}$



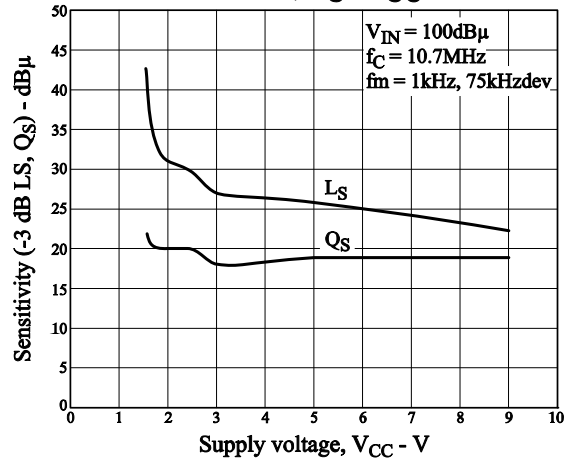
S/N - V_{CC}



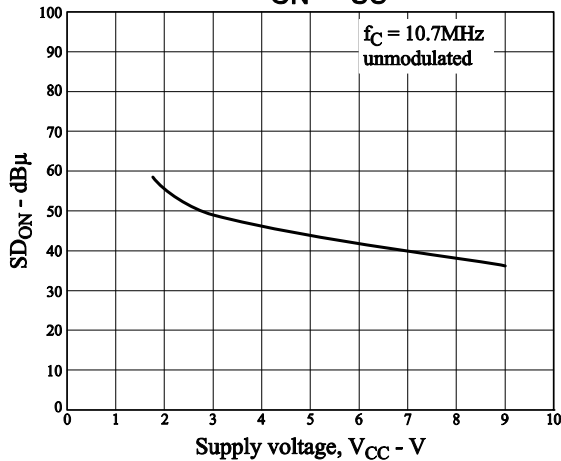
THD - V_{CC}



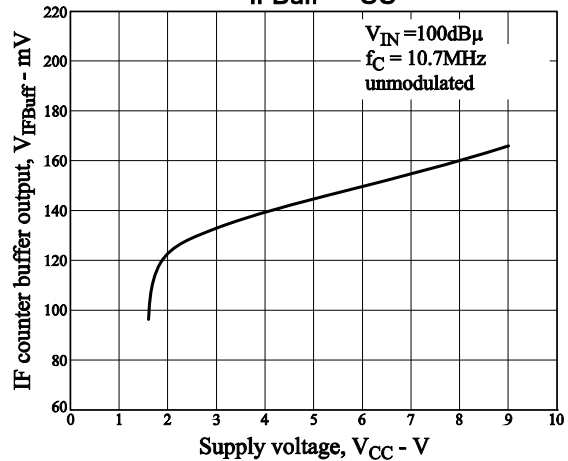
-3dBLS, $Q_S - V_{CC}$

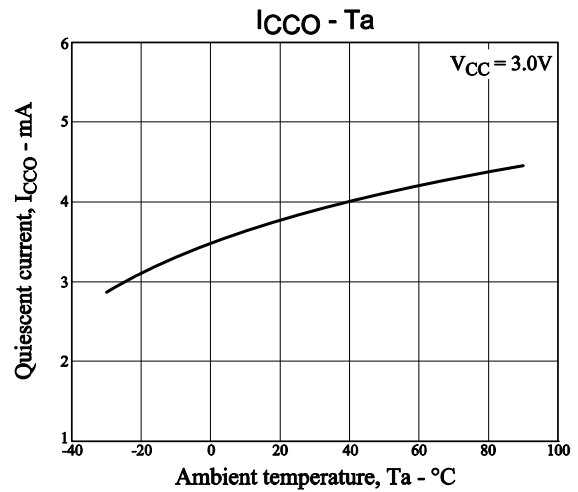
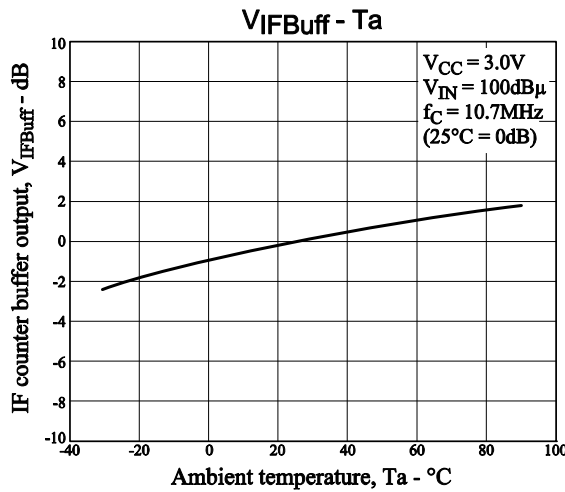
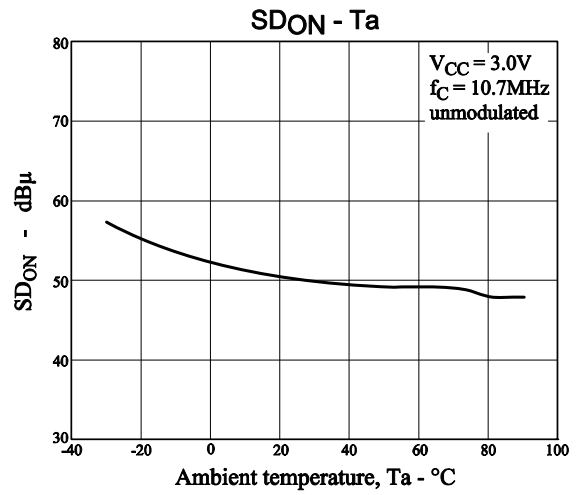
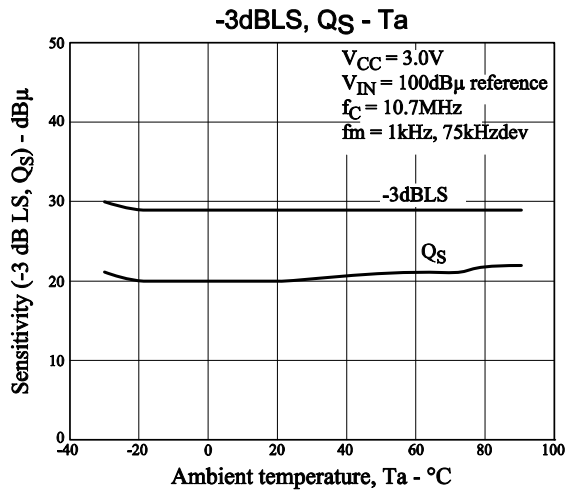
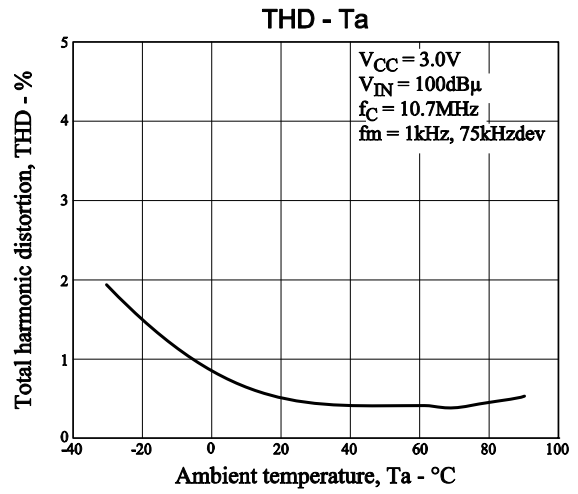
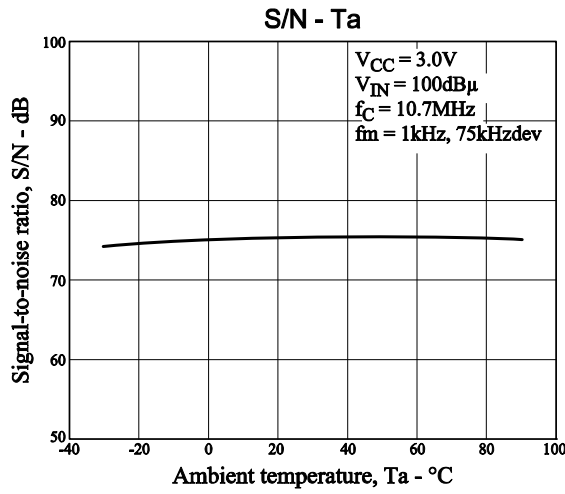
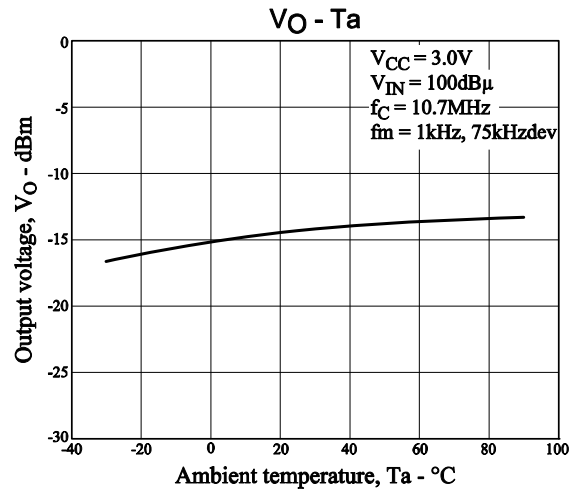
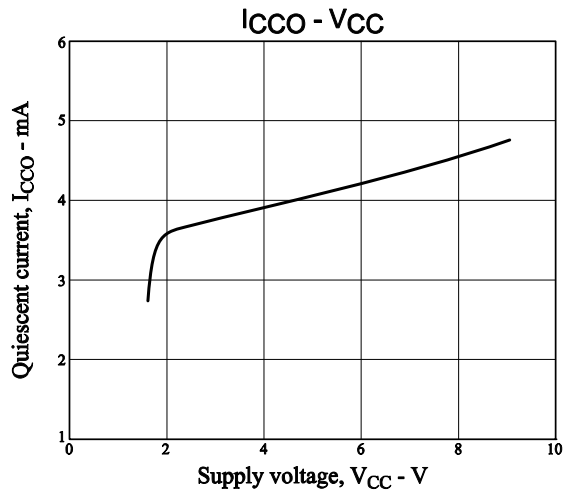


$SD_{ON} - V_{CC}$



$V_{IFBuff} - V_{CC}$





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