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LA4535MC

Monolithic Linear IC

Power Amplifier for 1.5V Headphone Stereo

Features

- Low current drain.
- 16Ω load drive capability.
- Excellent reduced voltage characteristics.
- Excellent power supply ripple rejection.
- Minimum number of external parts required (no input capacitor, feedback capacitor required).
- Less harmonic interference in radio band.
- On-chip power switch function, muting function.

Specifications

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max	Quiescent	4.5	V
Allowable power dissipation	P_d max		290	mW
Operating temperature	T_{opr}		-20 to +75	$^\circ\text{C}$
Storage temperature	T_{stg}		-40 to +125	$^\circ\text{C}$

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 $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		1.5	V
Operating voltage range	V_{CC} op		0.9 to 4.0	V
Recommended load resistance	R_L		16 to 32	Ω

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Electrical Characteristics at $T_a = 25^\circ\text{C}$, $R_L = 16\Omega$, $R_g = 600\Omega$, See specified Test Circuit.

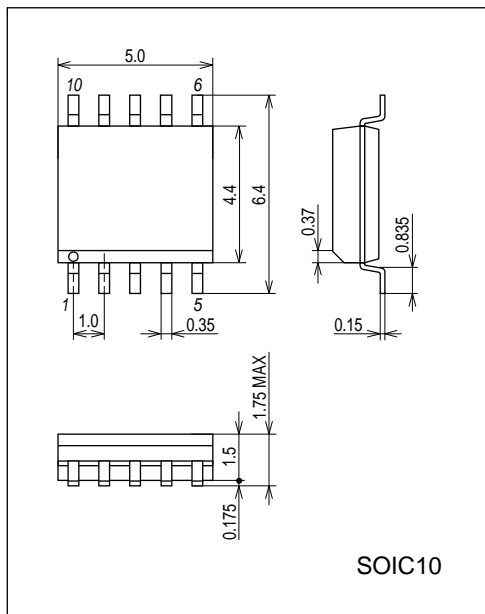
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current *1	I_{CCO1}	$V_{CC} = 1.2\text{V}$, quiescent		3.5	6.0	mA
	I_{CCO2}	$V_{CC} = 2.5\text{V}$, pin 10 \rightarrow GND		1.5	2.5	mA
	I_{CCO3}	$V_{CC} = 2.5\text{V}$, pin 1 \rightarrow GND			1.0	μA
Voltage gain	VG1	$V_{CC} = 1.2\text{V}$, $f = 1\text{kHz}$, $V_O = -20\text{dBm}$	20.5	22	23	dB
	VG2	$V_{CC} = 0.9\text{V}$, $f = 1\text{kHz}$, $V_O = -20\text{dBm}$	19.5	22	23	dB
Voltage gain difference	ΔVG1	$V_{CC} = 1.2\text{V}$, $f = 1\text{kHz}$, $V_O = -20\text{dBm}$			1.0	dB
	ΔVG2	$V_{CC} = 0.9\text{V}$, $f = 1\text{kHz}$, $V_O = -20\text{dBm}$			1.0	dB
Total harmonic distortion	THD	$V_{CC} = 1.2\text{V}$, $f = 1\text{kHz}$, $P_O = 0.5\text{mW}$		0.8	1.5	%
Output power	P_O	$V_{CC} = 1.5\text{V}$, $f = 1\text{kHz}$, THD = 10%	5	8		mW
Crosstalk	CT	$V_{CC} = 1.2\text{V}$, $f = 100\text{Hz}$, $R_g = 1\text{k}\Omega$, $V_O = -20\text{dB}$	40	45		dB
Ripple rejection	SVRR	$V_{CC} = 1.0\text{V}$, $f = 100\text{Hz}$, $R_g = 1\text{k}\Omega$, $V_R = -30\text{dBm}$, BPF = 100Hz	45	50		dB
Output noise voltage	V_{NO}	$V_{CC} = 2.5\text{V}$, $R_g = 1\text{k}\Omega$, BPF = 20Hz to 20kHz		30	44	μV
Power off effect	$V_{O(\text{off})}$	$V_{CC} = 0.9\text{V}$, $f = 100\text{Hz}$, pin 1 \rightarrow GND, $V_{IN} = -10\text{dB}$			-80	dBm
Muting effect	$V_{O(\text{MT})}$	$V_{CC} = 0.9\text{V}$, $f = 100\text{Hz}$, pin 10 \rightarrow GND, $V_{IN} = -10\text{dB}$			-80	dBm
Power on current sensitivity	$I_1(\text{on})$	$V_{CC} = 0.85\text{V}$, $V_5 \geq 0.5\text{V}$		0.1	1.0	μA
Power off voltage sensitivity	$V_1(\text{off})$	$V_{CC} = 0.85\text{V}$, $V_5 \leq 0.1\text{V}$	0.5	0.65		V
Muting off current sensitivity	$I_{10(\text{off})}$	$V_{CC} = 0.85\text{V}$, $V_5 \geq 0.5\text{V}$		0.3	1.0	μA
Muting on voltage sensitivity	$V_{10(\text{on})}$	$V_{CC} = 0.85\text{V}$, $V_5 \leq 0.1\text{V}$	0.5	0.65		V

Note) The quiescent current is represented by the current flowing into pin 6. The respective maximum currents flowing into pin 1 and pin 10 are calculated by $(V_{\text{pin } -0.5} / 16 [V / \text{k}\Omega])$ and the total current increases by these current values.

Package Dimensions

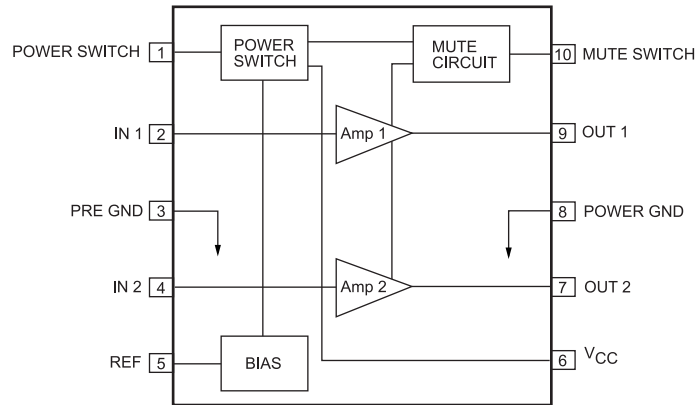
unit : mm (typ)

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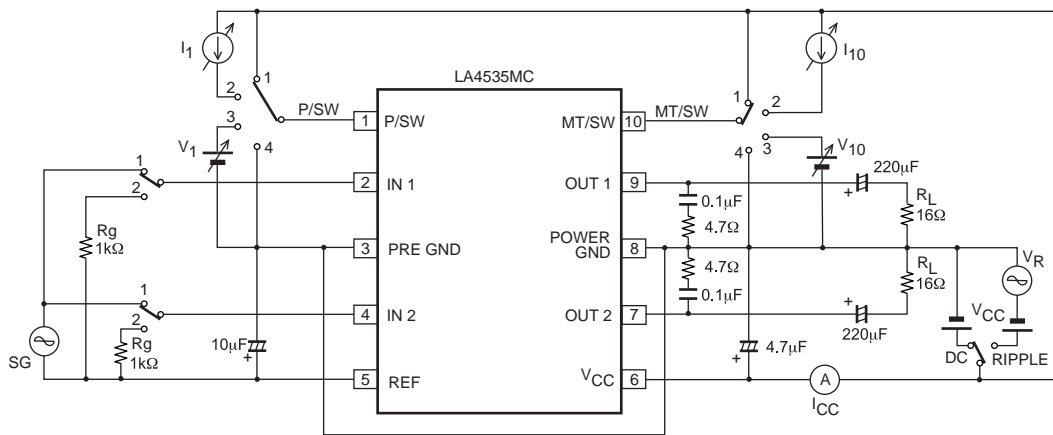


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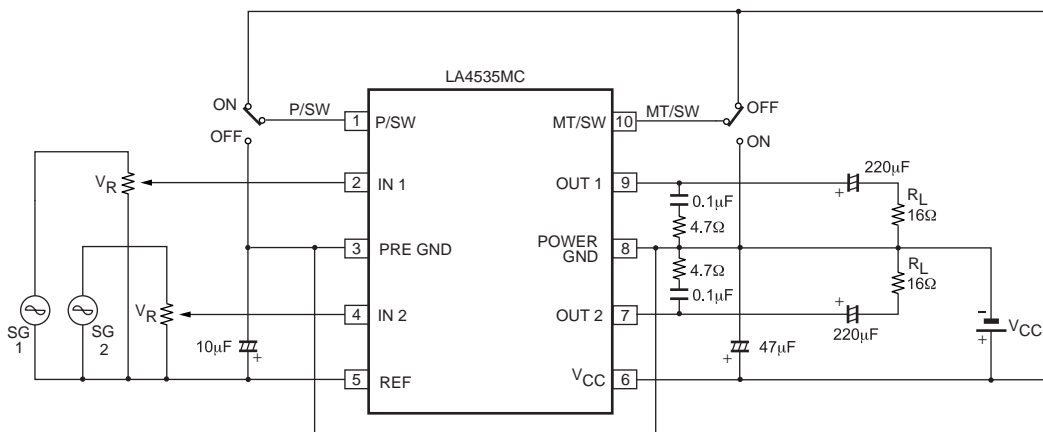
Block Diagram



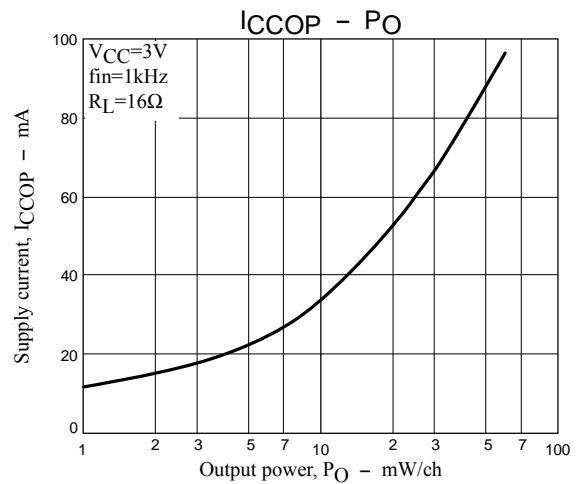
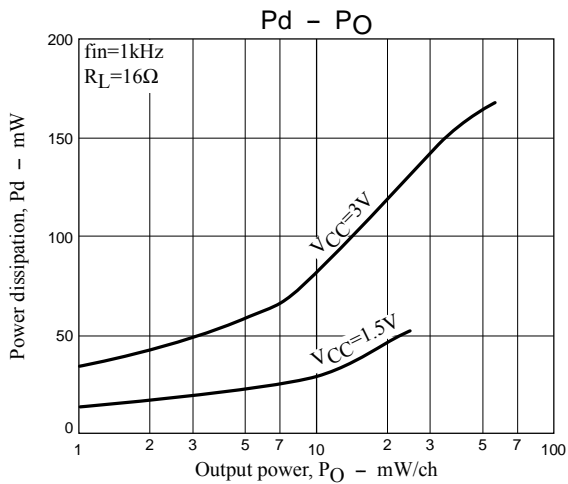
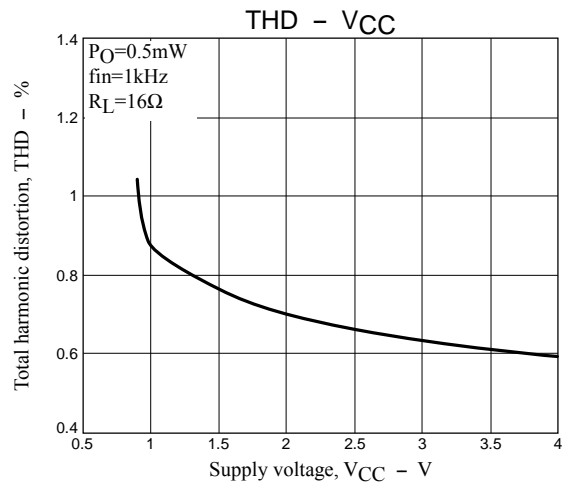
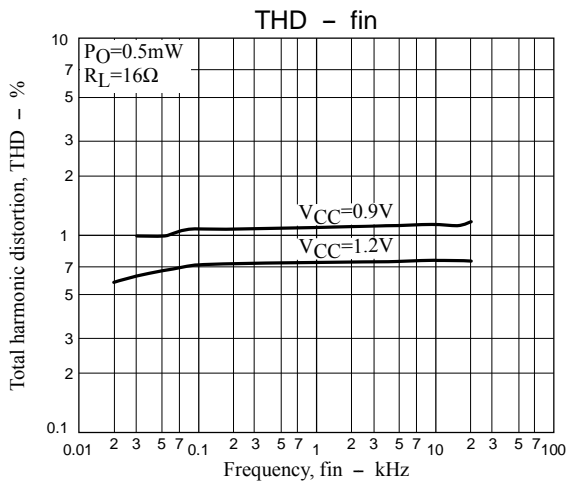
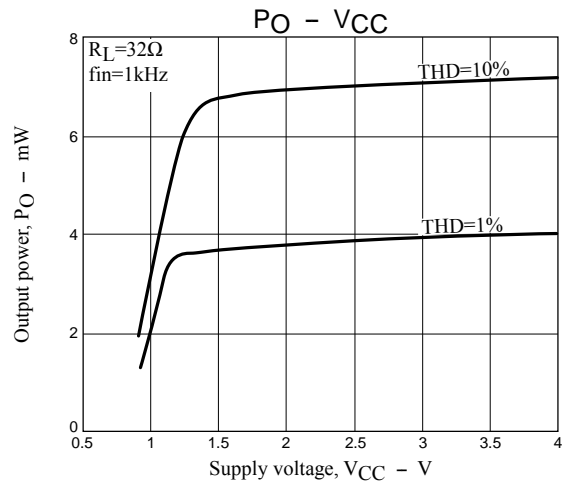
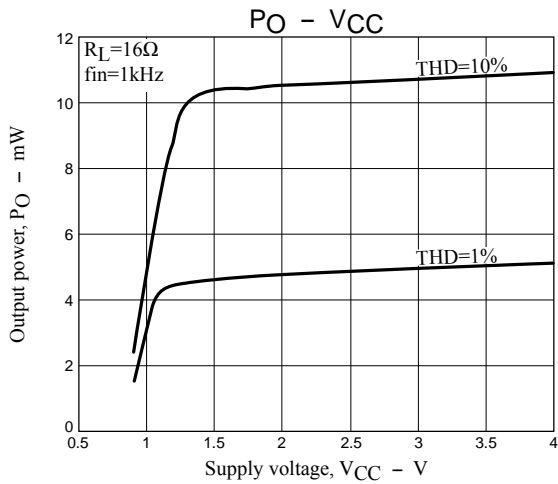
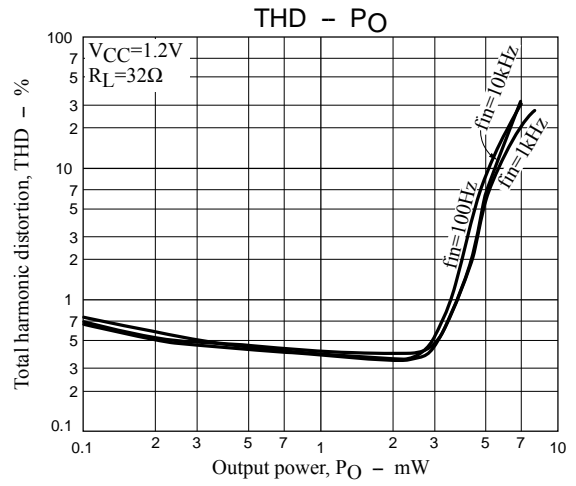
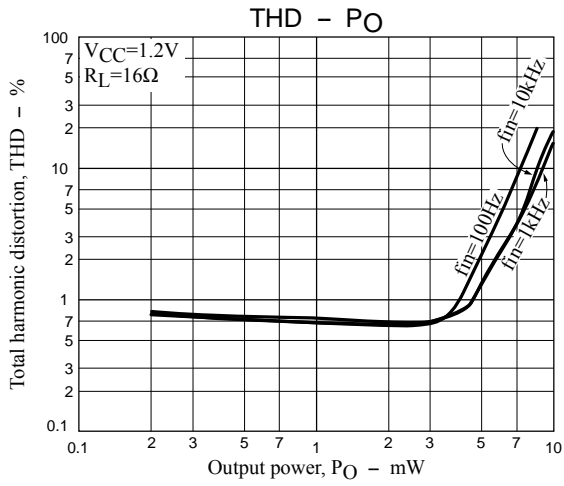
Test Circuit



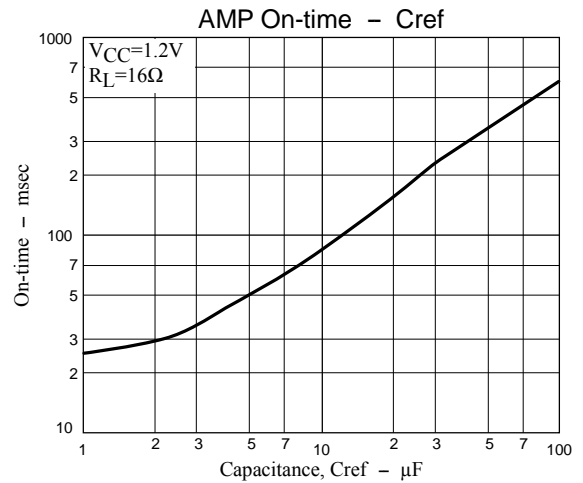
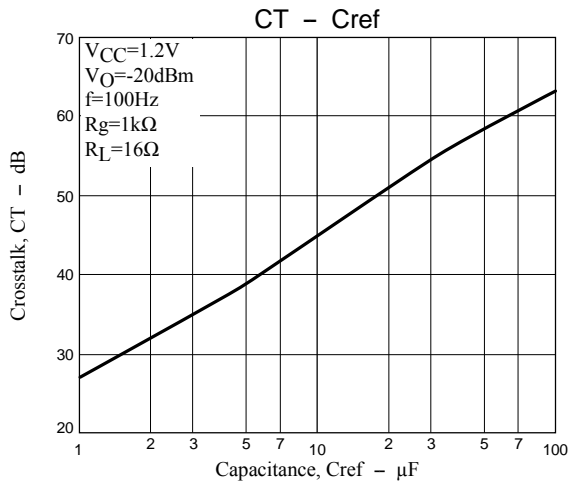
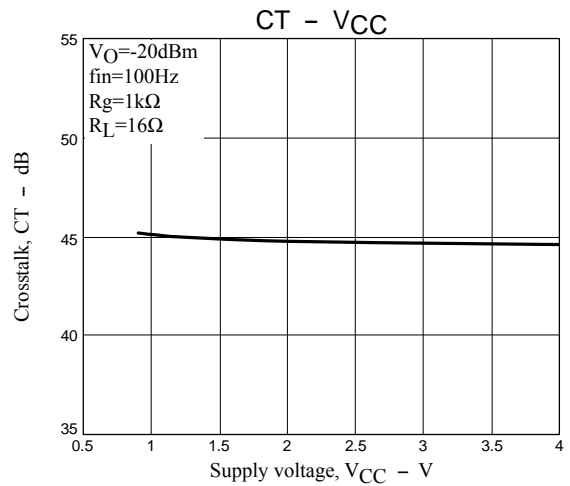
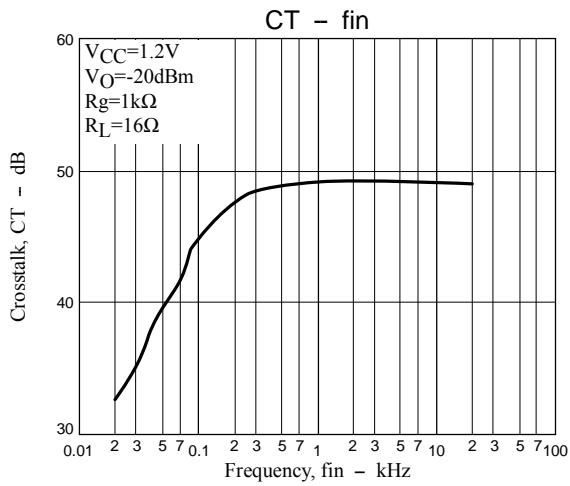
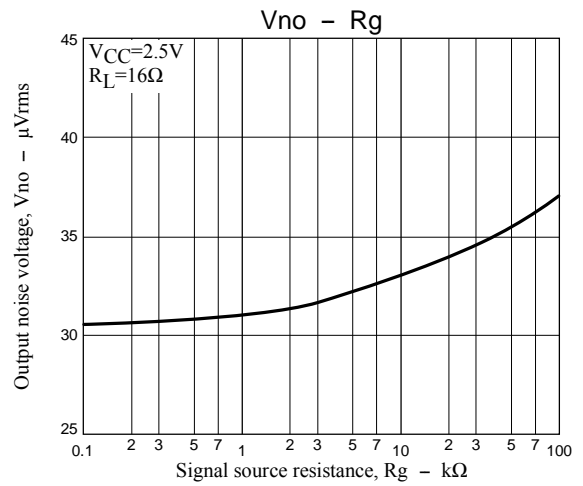
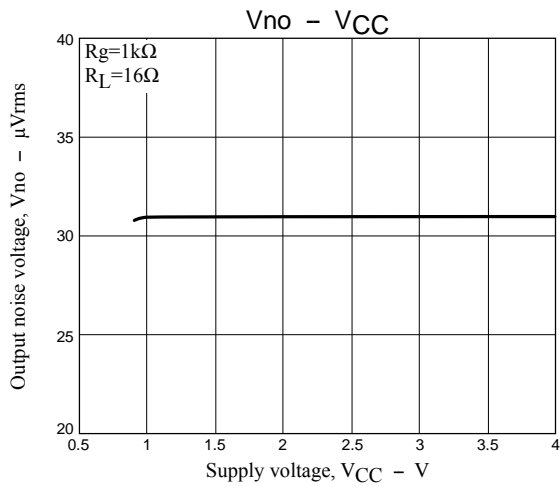
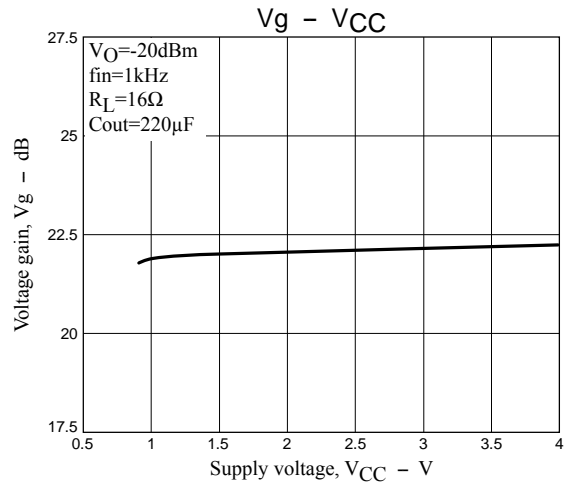
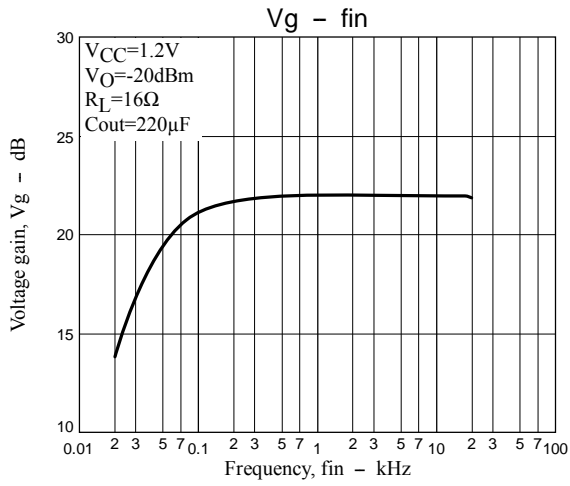
Sample Application Circuit

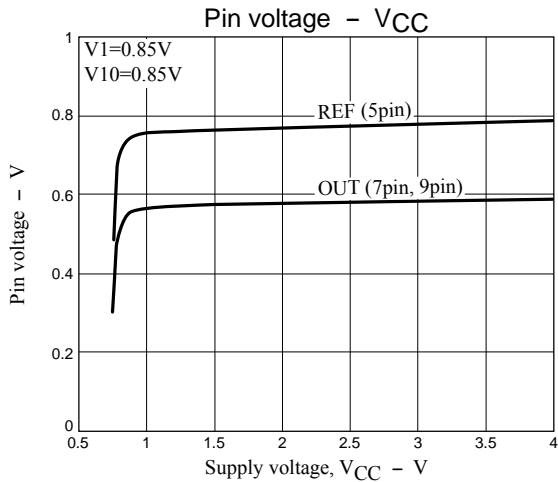
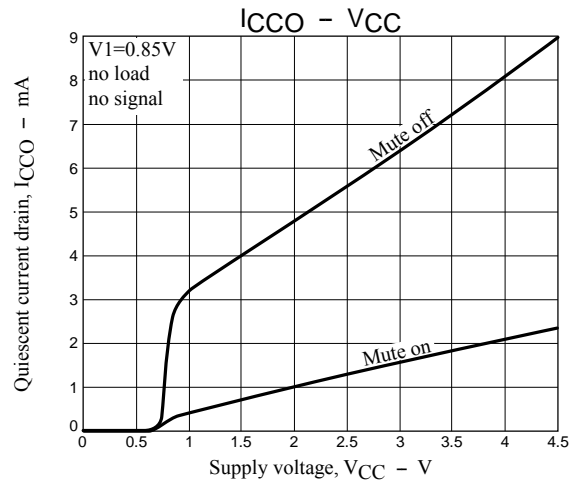
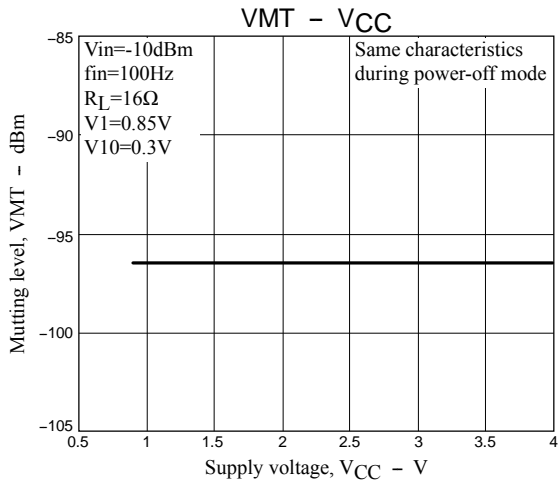
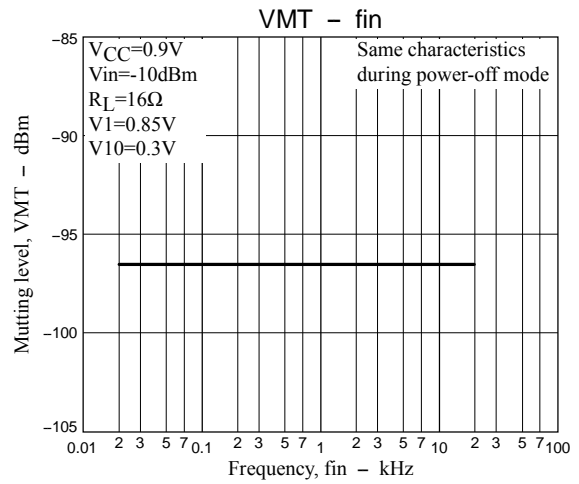
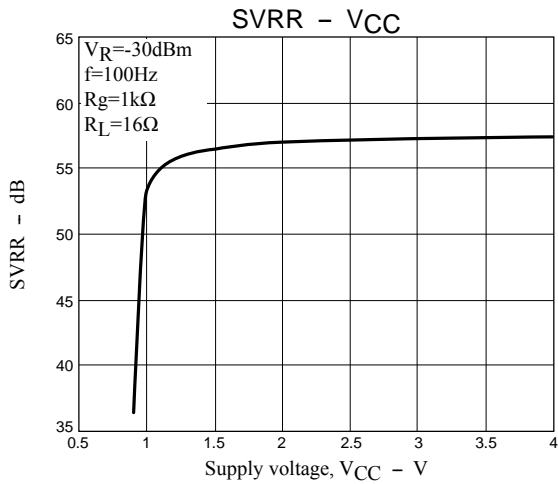
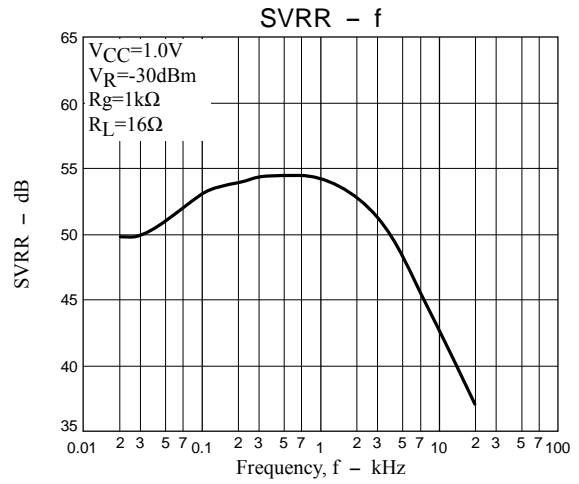
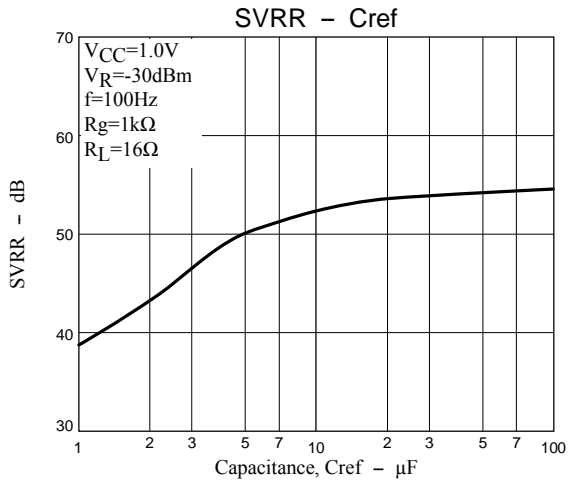


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