



KOREA ELECTRONICS CO.,LTD.

SEMICONDUCTOR
TECHNICAL DATA

KIA8122AN/AF
BIPOLAR LINEAR INTEGRATED CIRCUIT

3V AM/FM STEREO TUNER IC's

KIA8122AN/AF are the AM/FM 1chip tuner IC's, which are designed for portable radio and 3V headphone radios.

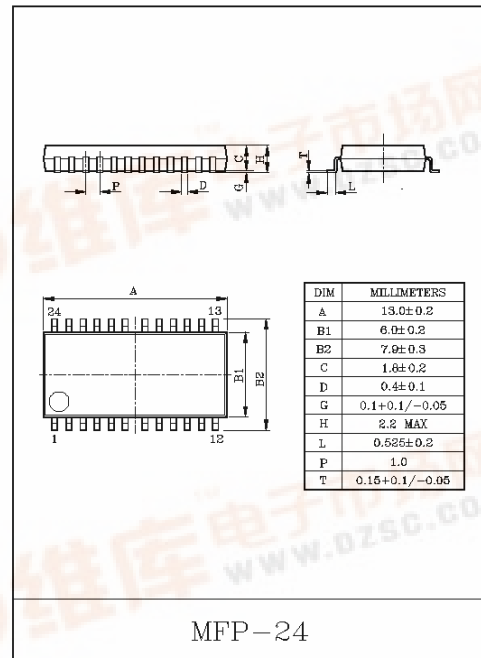
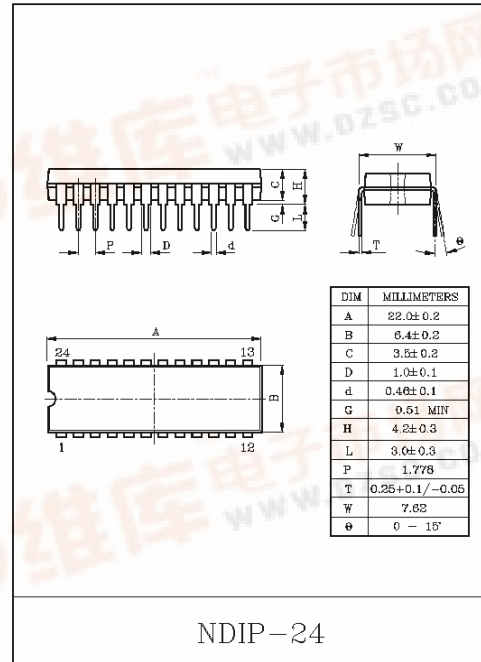
FEATURES

- Built-in FM F/E, AM/FM IF and FM MPX.
- AM detector coil, FM IFT and IF coupling condenser are not needed.
- For adopting ceramic discriminator and ceramic resonator, it is not necessary to adjust the FM quad detector circuit and MPX VCO circuit.
- S-curve characteristics of FM detection output is reverse characteristic.
- Operating supply voltage range.
: $V_{CC}=1.8\sim 7.0V$ ($T_a=25^\circ C$)

MAXIMUM RATINGS ($T_a=25^\circ C$)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V_{CC}	8	V
LED Current		I_{LED}	10	mA
LED Voltage		V_{LED}	8	V
Power Dissipation	KIA8122AN	P_D (Note)	1200	mW
	KIA8122AF		400	
Operating Temperature		T_{opr}	-25~75	$^\circ C$
Storage Temperature		T_{stg}	-55~150	$^\circ C$

Note : Derated above $T_a=25^\circ C$ in the proportion of 9.6mW/ $^\circ C$ for KIA8122AN and of 3.2mW/ $^\circ C$ for KIA8122AF



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ELECTRICAL CHARACTERISTICS

Unless otherwise specified, $T_a=25^{\circ}\text{C}$, $V_{CC}=3\text{V}$, F/E: $f=98\text{MHz}$, $f_m=1\text{kHz}$

FM IF: $f=10.7\text{MHz}$, $\Delta f=\pm 22.5\text{kHz}$, $f_m=1\text{kHz}$

AM: $f=1\text{MHz}$, $\text{Mod}=30\%$, $f_m=1\text{kHz}$, MPX: $f_m=1\text{kHz}$

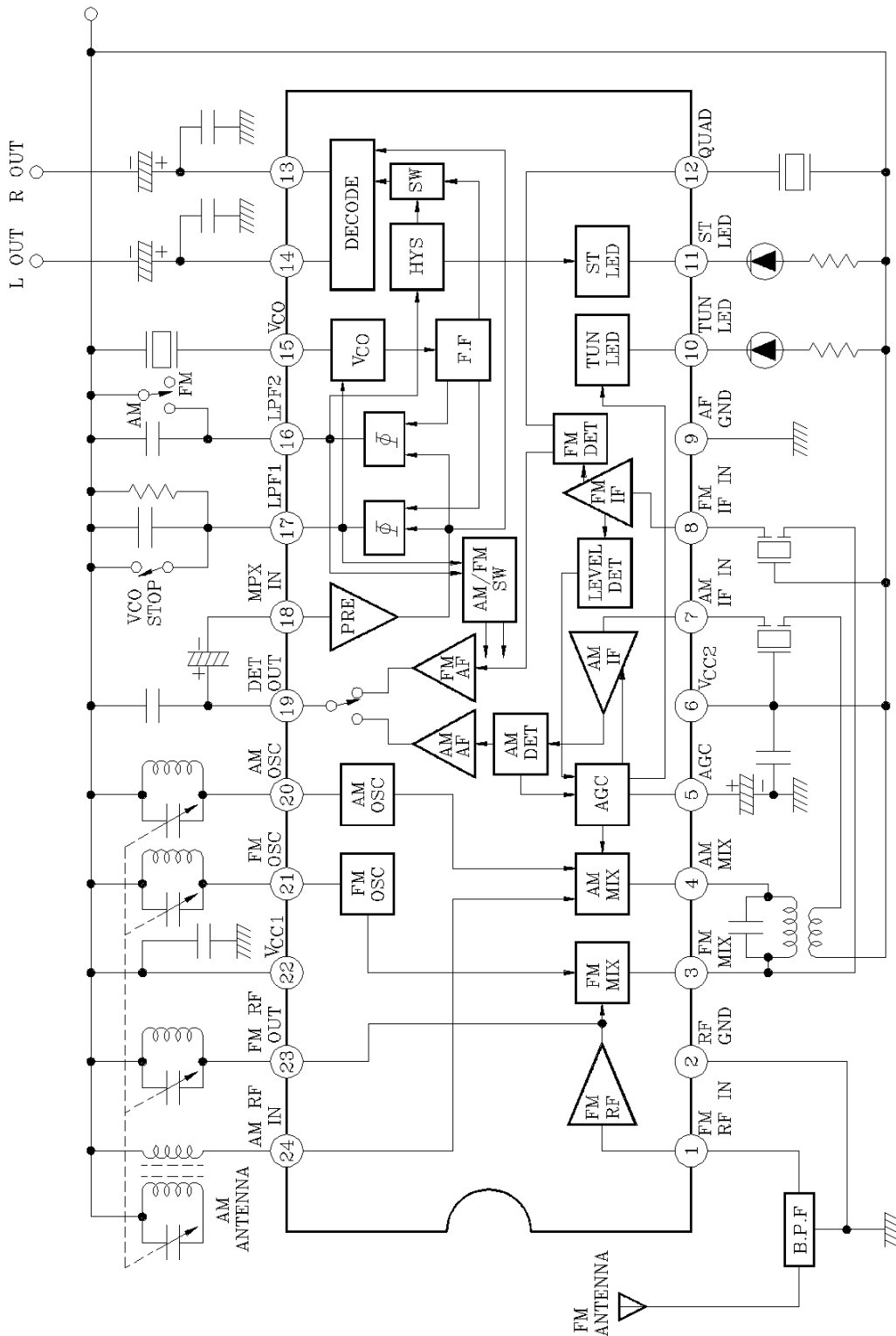
CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current		$I_{CC}(\text{FM})$	1	$V_{IN}=0$, FM Mode	-	14.0	18.5	mA
		$I_{CC}(\text{AM})$	1	$V_{IN}=0$, AM Mode	-	6.0	8.3	
F/E	Input Limiting Voltage	$V_{IN(\text{lim})}$	1	-3dB Limiting	-	14.0	-	dB μ
	Local OSC Voltage	V_{OSC}	2	$f_{osc}=72.3\text{MHz}$	70	105	140	mV $_{rms}$
FM IF	Input Limiting Voltage	$V_{IN(\text{lim})}$	1	-3dB Limiting	39	44	49	dB μ
	Recovered Output Voltage	V_{OD}	1	$V_{IN}=80\text{dB}\mu$	55	80	110	mV $_{rms}$
	Signal to Noise Ratio	S/N	1	$V_{IN}=80\text{dB}\mu$	-	70	-	dB
	Total Harmonic Distortion	THD	1	$V_{IN}=80\text{dB}\mu$	-	0.4	-	%
	AM Rejection Ratio	AMR	1	$V_{IN}=80\text{dB}\mu$	-	50	-	dB
	Lamp ON Sensitivity	V_L	1	$I_L=1\text{mA}$	43	48	53	dB μ
AM	Gain	G_V	1	$V_{IN}=26\text{dB}\mu$	20	40	80	mV $_{rms}$
	Recovered Output Voltage	V_{OD}	1	$V_{IN}=60\text{dB}\mu$	50	60	100	mV $_{rms}$
	Signal to Noise Ratio	S/N	1	$V_{IN}=60\text{dB}\mu$	-	44	-	dB
	Total Harmonic Distortion	THD	1	$V_{IN}=60\text{dB}\mu$	-	1.0	-	%
	Lamp ON Sensitivity	V_L	1	$I_L=1\text{mA}$	19	24	29	dB μ
Pin 19 Output Resistance		R_{19}	1	FM Mode	-	0.75	-	k Ω
				AM Mode	-	12.5	-	

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CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT		
MPX	Input Resistance	R_{IN}	1		-	24	-	$k\Omega$		
	Output Resistance	R_{OUT}	2		-	5	-	$k\Omega$		
	Max. Composite Signal Input Voltage	$V_{IN(MAX)}$ STEREO	1	L+R=90%, P=10% $f_m=1kHz$, THD=3%	-	350	-	mV_{rms}		
	Separation		Sep	1	L+R= $135mV_{rms}$ P= $15mV_{rms}$	$f_m=100Hz$	-	42	-	dB
						$f_m=1kHz$	35	42	-	
						$f_m=10kHz$	-	42	-	
	Total Harmonic Distortion	Monaural	THD (MONAURAL)	1	$V_{IN}=150mV_{rms}$	-	0.2	-	%	
		Stereo	THD (STEREO)		L+R= $135mV_{rms}$, P= $15mV_{rms}$	-	0.2	-		
	Voltage Gain		$G_V(MPX)$	1	$V_{IN}=150mV_{rms}$	-5	-3	-1	dB	
	Channel Balance		C.B.	1	$V_{IN}=150mV_{rms}$	-2	0	2	dB	
	Stereo Lamp Sensitivity	ON	$V_L(ON)$	1	Pilot Input	-	8	15	mV_{rms}	
		OFF	$V_L(OFF)$			2	6	-		
Stereo Lamp Hysteresis		V_H	1		-	2	-	mV_{rms}		
Capture Range		C.R.	1	P= $15mV_{rms}$	-	1.3	-	%		
Signal to Noise Ratio		S/N	1		-	70	-	dB		

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BLOCK DIAGRAM



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EXPLANATION OF TERMINALS

Pin NO.	ITEM	INTERNAL CIRCUIT	DC VOLTAGE(V) (at no signal)	
			AM	FM
1	FM-RF IN		0	0.7
2	GND1 (GND for Rf Stage)		0	0
3	FM MIX		2.3	1.8
4	AM MIX		2.3	1.8
5	AGC (AM AGC)		0	0
6	Vcc2 (Vcc for IF/MPX Stage)		3.0	3.0

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Pin NO.	ITEM	INTERNAL CIRCUIT	DC VOLTAGE(V) (at no signal)	
			AM	FM
7	AM IF IN		3.0	3.0
8	FM IF IN		3.0	3.0
9	GND2 (GND for IF/MPX Stage)		0	0
10	TUN LED (Tuning LED)		-	-
11	ST LED (Stereo LED)		-	-
12	QUAD (FM QUAD, Detector)		2.4	2.1

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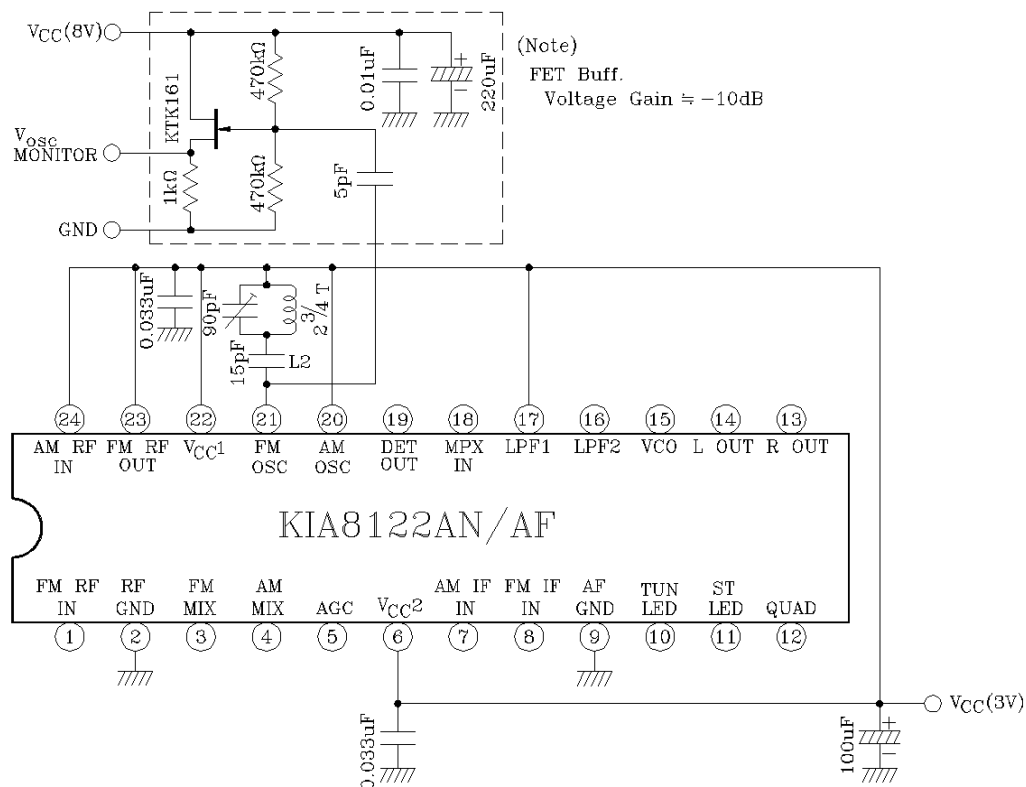
Pin NO.	ITEM	INTERNAL CIRCUIT	DC VOLTAGE(V) (at no signal)	
			AM	FM
13 14	R-OUT(R-ch Output) L-OUT(L-ch Output)		1.0	1.0
15	VCO		2.5	2.5 (VCO STOP MODE)
16	LPF2 ·LPF Terminal for Synchronous Detector ·Bias Terminal for AM/AM SW Circuit $V_{16}=V_{CC} \rightarrow$ AM $V_{16}=\text{Open} \rightarrow$ FM		3.0	2.2 (VCO STOP MODE 2.7)
17	LPF1 ·LPF Terminal for Phase Detector Vco Stop Terminal $V_{17}=V_{CC} \rightarrow$ VCO Stop		2.7	2.2
18	MPX IN		0.7	0.7

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Pin NO.	ITEM	INTERNAL CIRCUIT	DC VOLTAGE(V) (at no signal)	
			AM	FM
19	DET OUT		1.5	1.2
20	AM OSC		3.0	3.0
21	FM OSC		3.0	3.0
22	Vcc1 (Vcc for RF Stage)		3.0	3.0
23	FM RF OUT		3.0	3.0
24	AM RF IN		3.0	3.0

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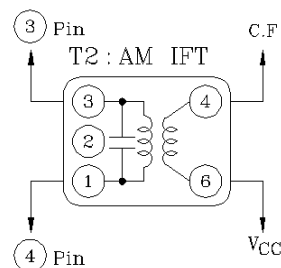
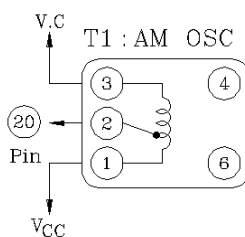
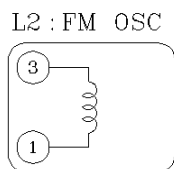
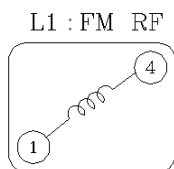
TEST CIRCUIT 2



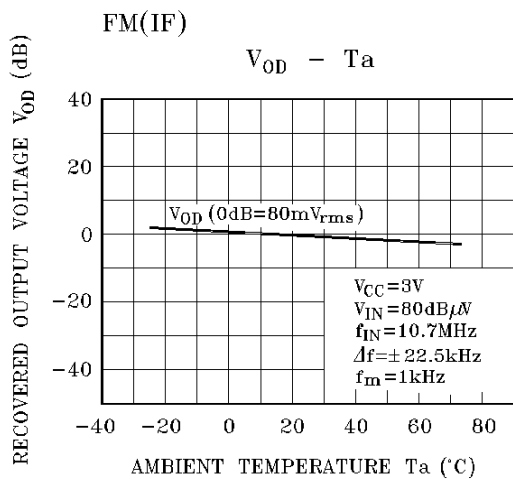
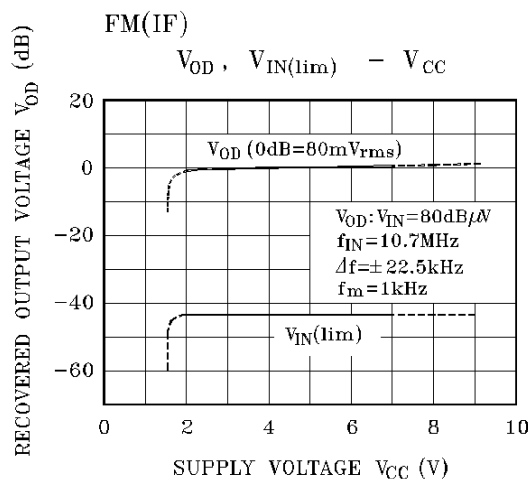
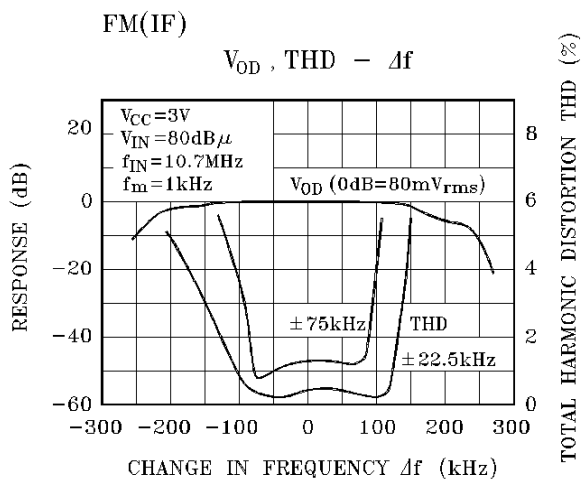
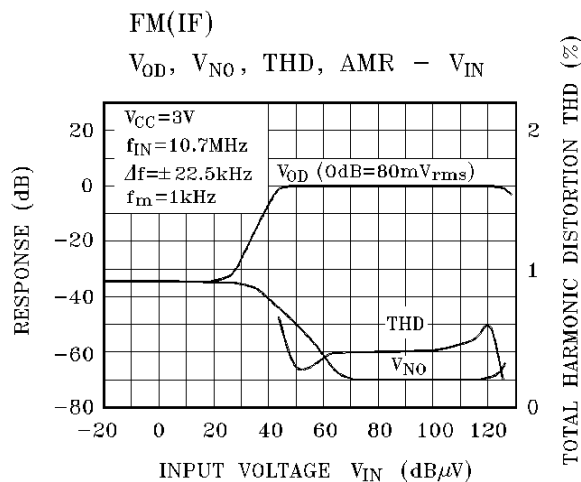
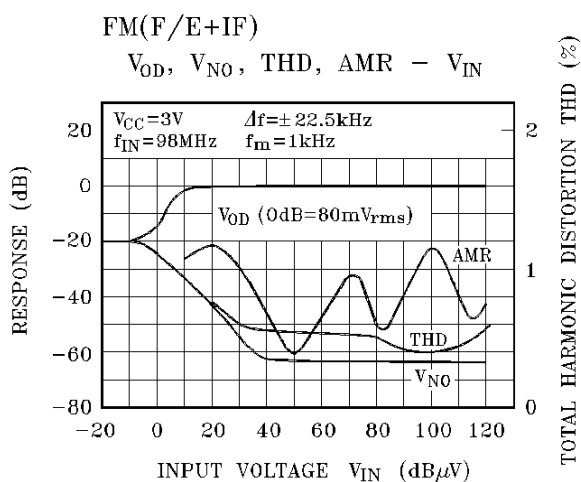
COIL DATA

COIL NO.	TEST FREQ.	L (μH)	Co (pF)	Qo	TURNS					WIRE (mm ϕ)	REFERENCE
					1-2	2-3	1-3	1-4	4-6		
L ₁ FM RF	100MHz			100				2 $\frac{1}{2}$		0.5 UEW	
L ₂ FM OSC	100MHz			100			2 $\frac{3}{4}$			0.5 UEW	
T ₁ AM OSC	796kHz	288		115	13	73				0.08 UEW	Ⓔ 4147-1356-038 Ⓚ KSA0406
T ₂ AM IFT	455kHz		180	120			180		15	0.08 UEW	Ⓔ 2150-2162-165 Ⓚ KSAM307

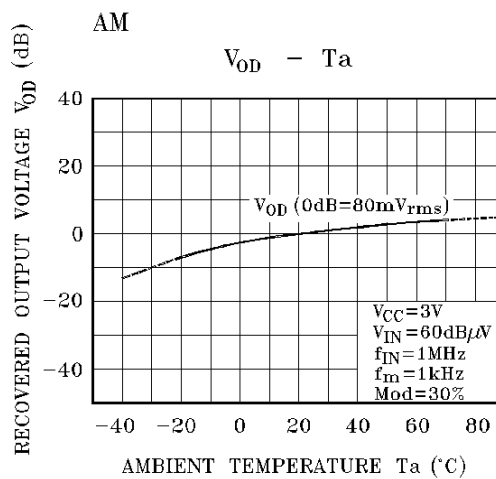
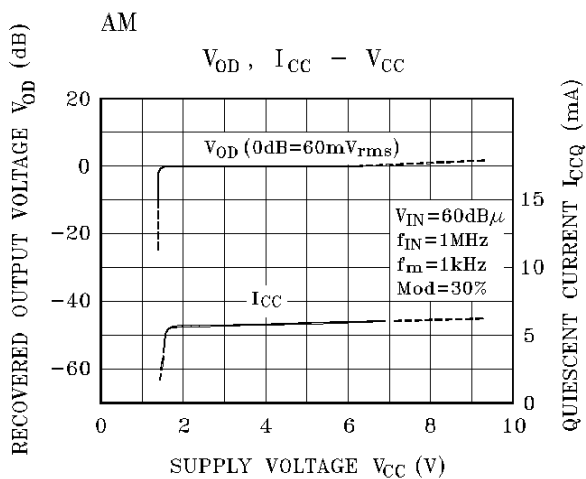
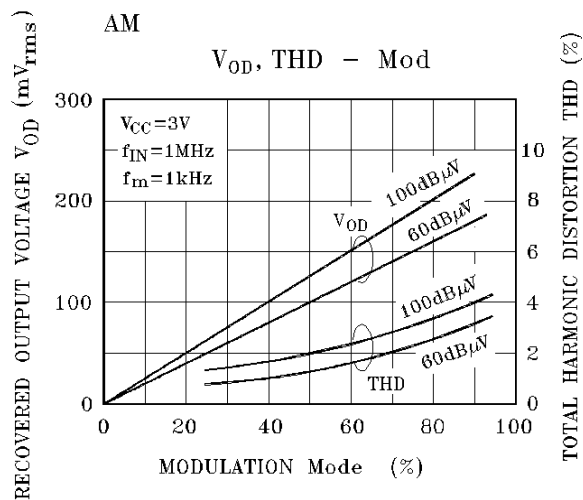
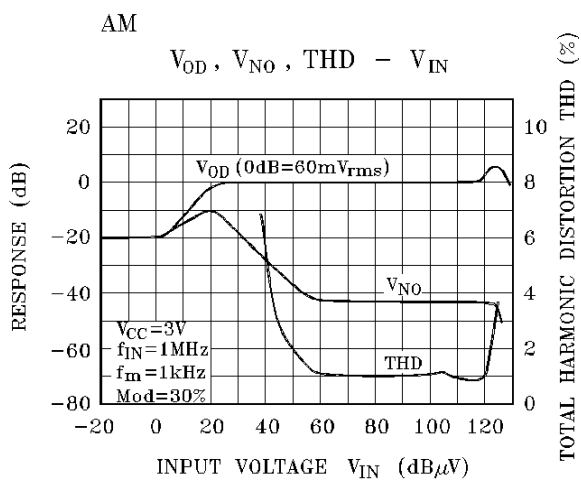
Ⓔ : SUMIDA ELECTRIC CO., LTD.
 Ⓚ : KWANG SUNG ELECTRONICS CO., LTD (Tel : 02)716-0034)



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