M51523L

DUAL CHANNEL ELECTRONIC ATT

DESCRIPTION

The M51523L is a semiconductor integrated circuit consisting of dual electronic attenuator and a balancer. It is housed in a compact 14-pin ZIL package and is designed for use in car audio equipment, radio cassette tape recorder, TV set etc. Its attenuation and balance can be controlled by DC volume control voltage and DC balance control voltage respectively. And the included reference voltage supply is available for DC volume control voltage or DC balance control voltage.

FEATURES

- High attenuation ····· 92dB(typ.)
  (f=1kHz, V_i=150mV IHF-A Network)
- Low distortion ····· 0.015%(typ.)
  (f=1kHz, V_i=150mV Volume max.)
- Low noise ····· 3.6μVrms(Volume min IHF-A Network)
- Including stabilized power supply, operation not affected by supply voltage variation.
- Operation almost not affected by variation of temperature.

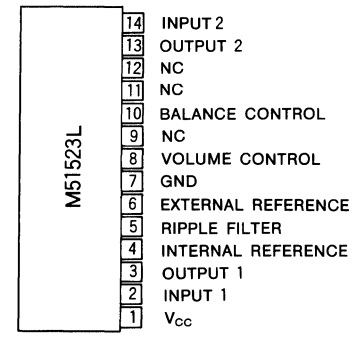
APPLICATION

Car audio, radio cassette tape recorder, TV set

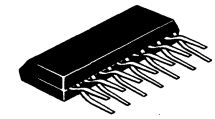
RECOMMENDED OPERATING CONDITIONS

Supply voltage ····· 8 ~ 16V
Rated supply voltage ····· 12V

PIN CONFIGURATION (TOP VIEW)

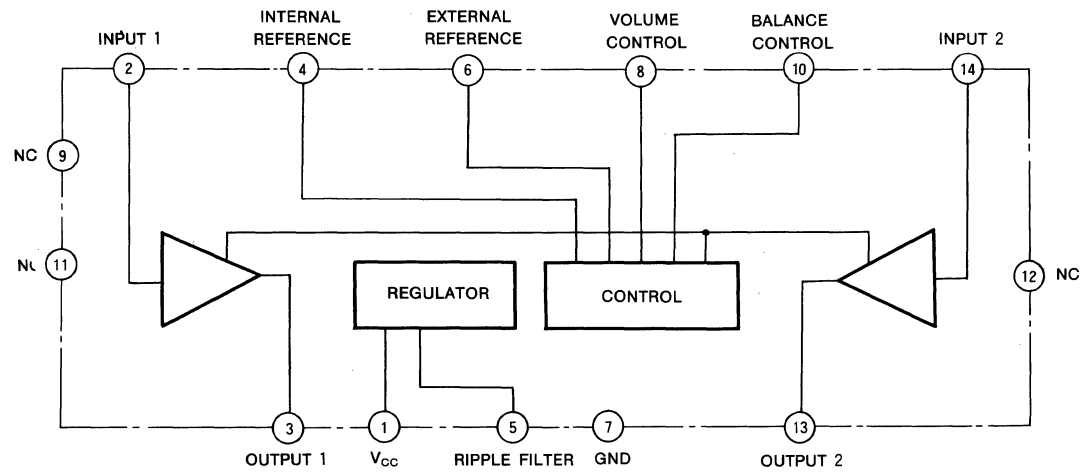


Outline 14P5A NC : NO CONNECTION



14-pin molded plastic ZIL

BLOCK DIAGRAM



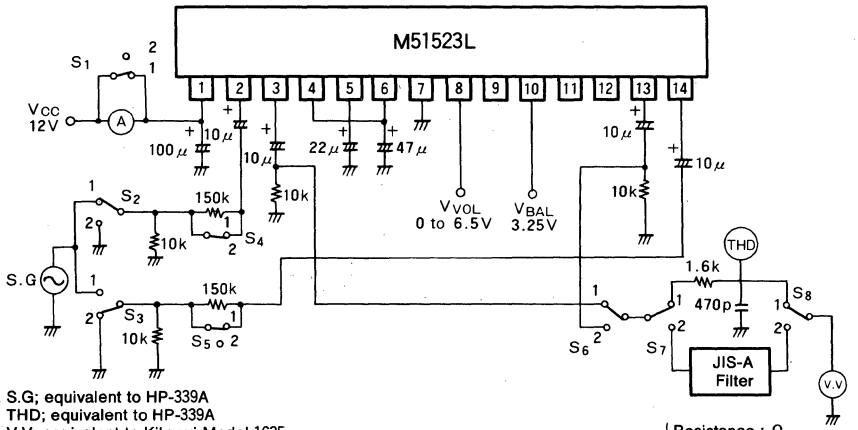
ABSOLUTE MAXIMUM RATINGS (T_a=25℃, unless otherwise noted)

Symbol	Parameter	Conditions	Limits	Unit
V_{CC}	Supply voltage	Quiescent	18	V
I_{CC}	Circuit current		30	mA
P_d	Power dissipation		550	mW
K_θ	Thermal derating	T_a≧25℃	5.5	mW/℃
T_{opr}	Operating temperature		−20～+75	℃
T_{stg}	Storage temperature		−40～+125	℃

ELECTRICAL CHARACTERISTICS (T_a=25℃, V_{CC}=12V, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{CCO}	Quiescent circuit current	no signal V_{OL} Min	7	12	20	mA
ATT	Attenuation	IHF-A V_{OL} Min V_i=150mVrms	83	92		
C.B	Channel balance		−3	0	3	dB
THD	Total harmonic distortion	V_{OL} Max V_i=150mVrms 1kHz		0.015	0.1	%
R_i	Input resistance		50	150		kΩ
V_i(max)	Maximum input voltage	THD=1% at 1kHz	1.0	1.5		Vrms
N_O	Output noise voltage	V_i=0 IHF-A Network		3.6	10	μVrms
$N_{O(r)}$	Remaining output noise voltage	V_i=150mVrms IHF-A Network		3.6	10	μVrms

TEST CIRCUIT

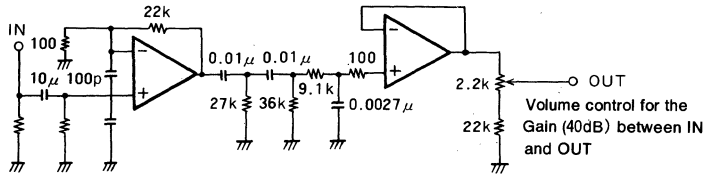


Note : 1. S.G; equivalent to HP-339A
THD; equivalent to HP-339A
V.V; equivalent to Kikusui Model 1635

Units | Resistance : Ω
Capacitance : F

Note : 2. Low-ripple-noise power supply recommended (under 2μV)

The circuit below can be substituted for JIS-A Network.
(Note; gain 40dB)



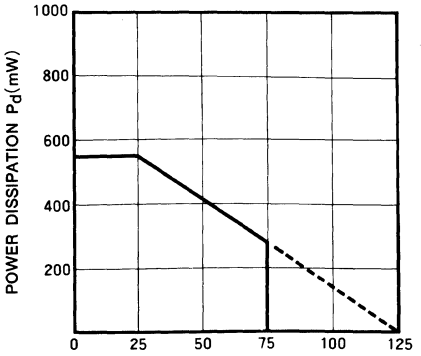
MITSUBISHI ELECTRIC

TEST METHODS (T_a=25℃, V_{CC}=12V, f=1kHz, unless otherwise noted)

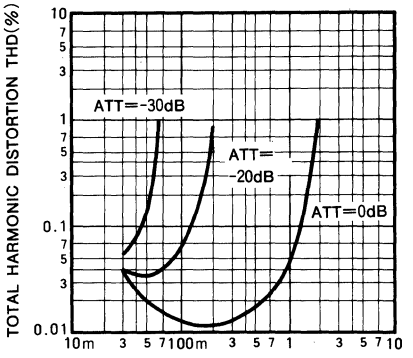
Parameter	Switch connection								Methods
	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	
I_{CCO}	2	2	2	1	1	—	1	1	Read value on ammeter
ATT	1	1 1	1 1	1	1	1 2	1	1	V_{VOL}:0 to 6.5V ATT=20 log(V_i/V_O)dB
ΔG_V	1	1 1	1 1	1	1	1 2	1	1	Channel balance at volume max
THD	1	1	1	1	1	1 2	1	1	V_O=1Vrms, volume max take reading from distortion meter
R_i	1	1	1	1→2 1	1 1→2	1 2	1	1	V_{01} is output for S_4 of 1, V_{02} is output for S_4 of 2 R_i=150/(V_{01}/V_{02}−1)kΩ
V_i(max)	1	1	1	1	1	1 2	1	1	Input voltage level at which THD of output voltage exceeds 1% at volume max
N_O	1	2	2	1	1	1 2	1	1	Volume min, R_g=10kΩ
$N_{O(r)}$	1	1	1	1	1	1 2	2	2	IHF-A Network

ELECTRICAL CHARACTERISTICS CURVE

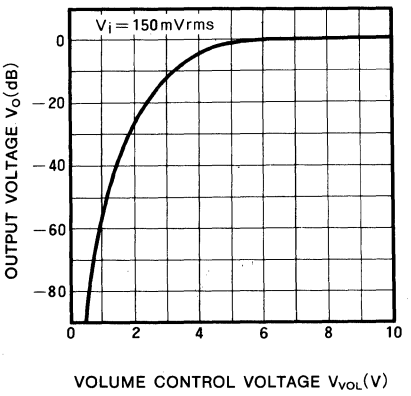
THERMAL DERATING
(MAXIMUM RATING)



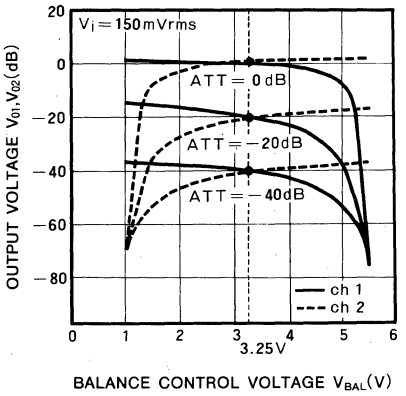
TOTAL HARMONIC DISTORTION
VS OUTPUT VOLTAGE



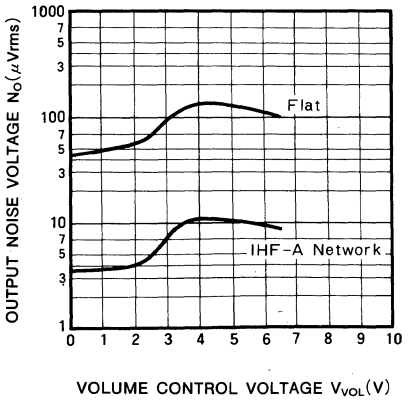
OUTPUT VOLTAGE VS VOLUME CONTROL VOLTAGE



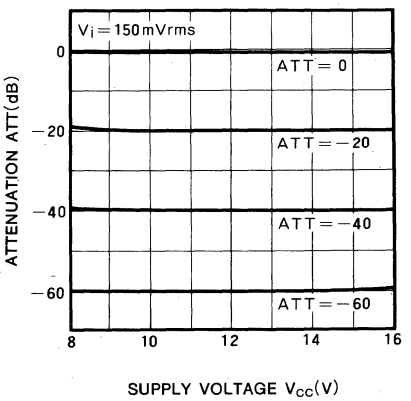
OUTPUT VOLTAGE VS BALANCE CONTROL VOLTAGE



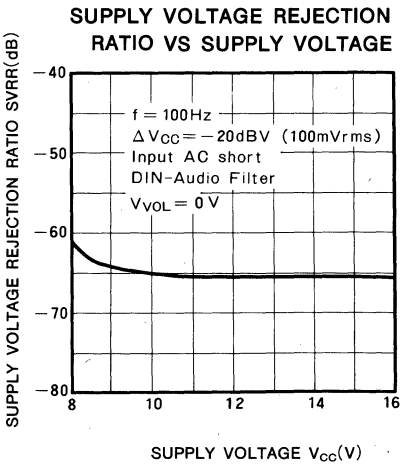
OUTPUT NOISE VOLTAGE VS VOLUME CONTROL VOLTAGE



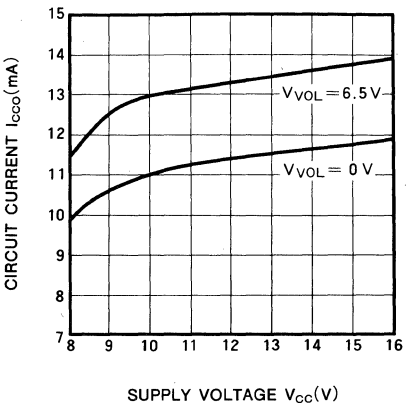
ATTENUATION VS SUPPLY VOLTAGE



SUPPLY VOLTAGE REJECTION RATIO VS SUPPLY VOLTAGE

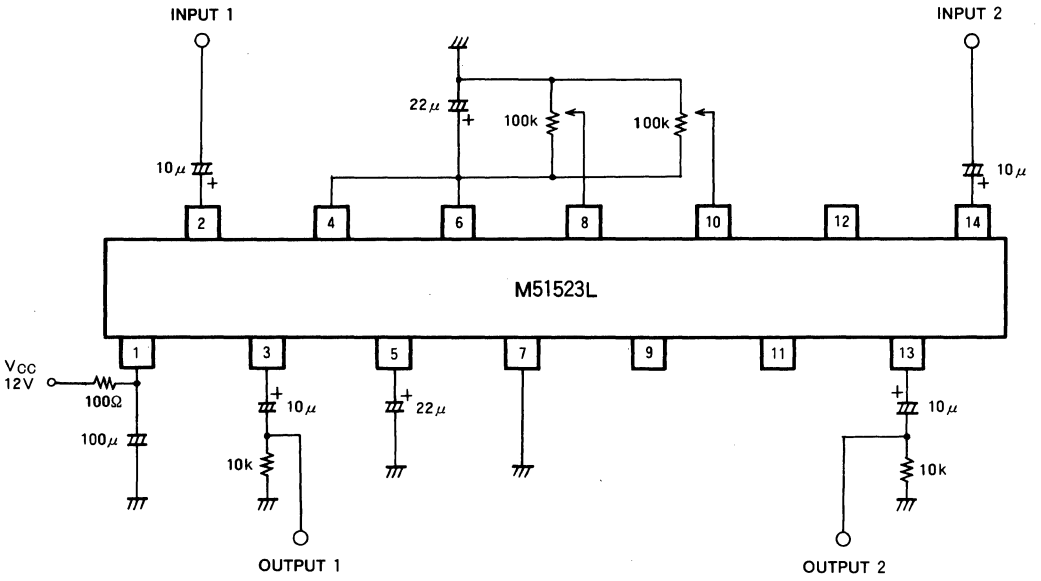


CIRCUIT CURRENT VS SUPPLY VOLTAGE



MITSUBISHI ELECTRIC

APPLICATION EXAMPLE



Units Resistance : Ω
Capacitance : F