

CXA1846AM/AN

Electronic volume control

Description

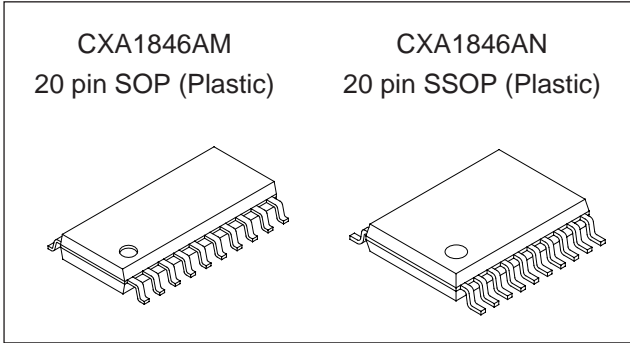
The CXA1846AM/AN is an electrical volume control IC for use in car radios/stereos and radio-cassette recorders featuring serial data control. It has improved over the CXA1846M/N by reducing the 'pop' noise during volume level-switchings.

Features

- Volume adjustment (0dB to -87dB, -∞dB)
- Balance
- Serial data control (DATA, CLK, CE)
- Single 8V power supply
- Zero-cross detection circuit

Structure

Bipolar silicon monolithic IC



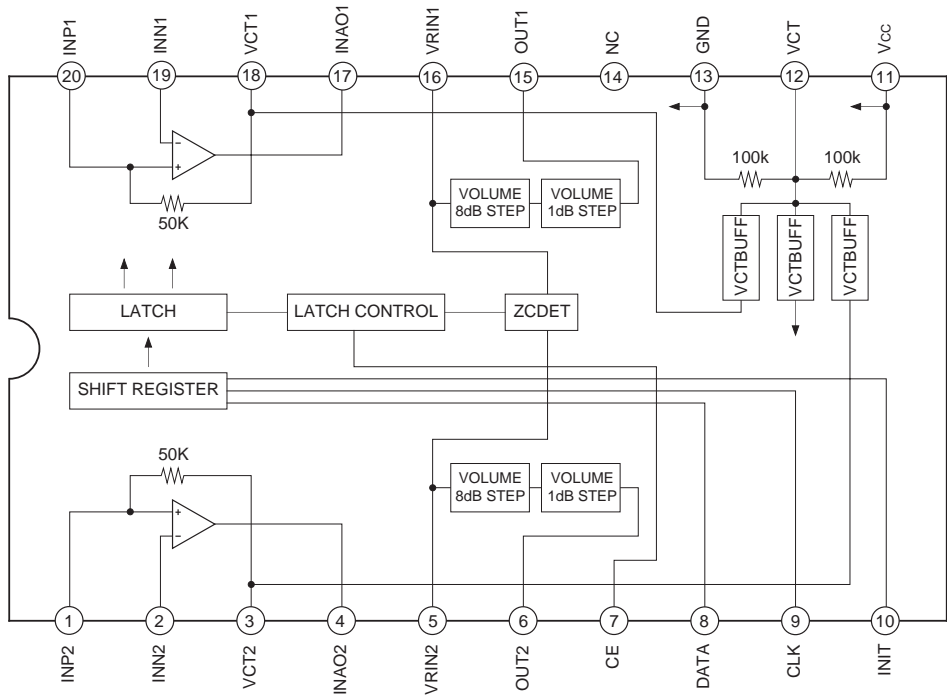
Absolute Maximum Ratings (Ta=25 °C)

• Supply voltage	V _{CC}	13	V
• Operating temperature	T _{opr}	-40 to +85	°C
• Storage temperature	T _{stg}	-65 to +150	°C
• Allowable power dissipation	P _D	SOP 350 (75°C)	mW
		SSOP 220 (75°C)	mW

Recommended Supply Voltage Range

Supply voltage	V _{CC}	6 to 12	V
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Block Diagram and Pin Configuration



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Pin Description

Pin No.	Symbol	I/O resistance voltage	Equivalent circuit	Description
1 20	INP2 INP1	50kΩ VCT		Input operational amplifier positive phase input
2 19	INN2 INN1	— VCT		Input operational amplifier reversed phase input
3 18	VCT2 VCT1	— VCT		VCT buffer output
4 17	INAO2 INAO1	— VCT		Input operational amplifier
5 16	VRIN2 VRIN1	8.2kΩ VCT		Volume input

Pin No.	Symbol	I/O resistance voltage	Equivalent circuit	Description
6 15	OUT2 OUT1	— VCT		Volume output
7	CE	$\equiv \infty$ —		Latch enable
8	DATA	$\equiv \infty$ —		Serial data input
9	CLK	$\equiv \infty$ —		Serial clock
10	INIT	— —		System reset
11	Vcc	—		+ power supply
12	VCT	— VCT		Mid-point potential
13	GND	— —		GND

Electrical Characteristics

(Unless otherwise specified $V_{CC} = 8V$, $T_a = 25^{\circ}C$)

Item	Symbol	Measurement Condition	Min.	Typ.	Max.	Unit	
Circuit current	I _{cc}	No signal	5	8	12	mA	
Total harmonic distortion	THD	1kHz, 5dBm	—	0.003	0.01	%	
Output noise voltage	V _n	Input shorted	—	5	7	μVrms	
Maximum output voltage	V _{om}	1kHz	8	—	—	dBm	
Separation	CS	1kHz	85	90	—	dB	
Maximum attenuation	ATT _m		85	90	—	dB	
Input voltage	High	V _{sh}	Data, INIT	3	—	6	V
	Low	V _{sl}	CLK, CE	0	—	1.5	V
Input voltage range	V _{in}		1	—	$V_{CC} - 1$	V	
Maximum output current	I _{max}	Input buffer amplifier output current	—	—	1	mA	

RESET

The IC is reset by reducing the voltage at the INIT pin to 1V or less when CLK is high. Reset can not be performed when CLK is low. The table below shows the status when the IC has been reset.

MODE	Setting
VRC1	— ∞
VRF1	−7dB
VRC2	— ∞
VRF2	−7dB

Data Allocation

Fast bit	D1	NOP	MSB	
	D2 D3 D4 D5	VRC1		
	D6 D7 D8	VRF1		
	D9	NOP		
	D10 D11 D12 D13	VRC2		
	D14 D15 D16	VRF2		LSB

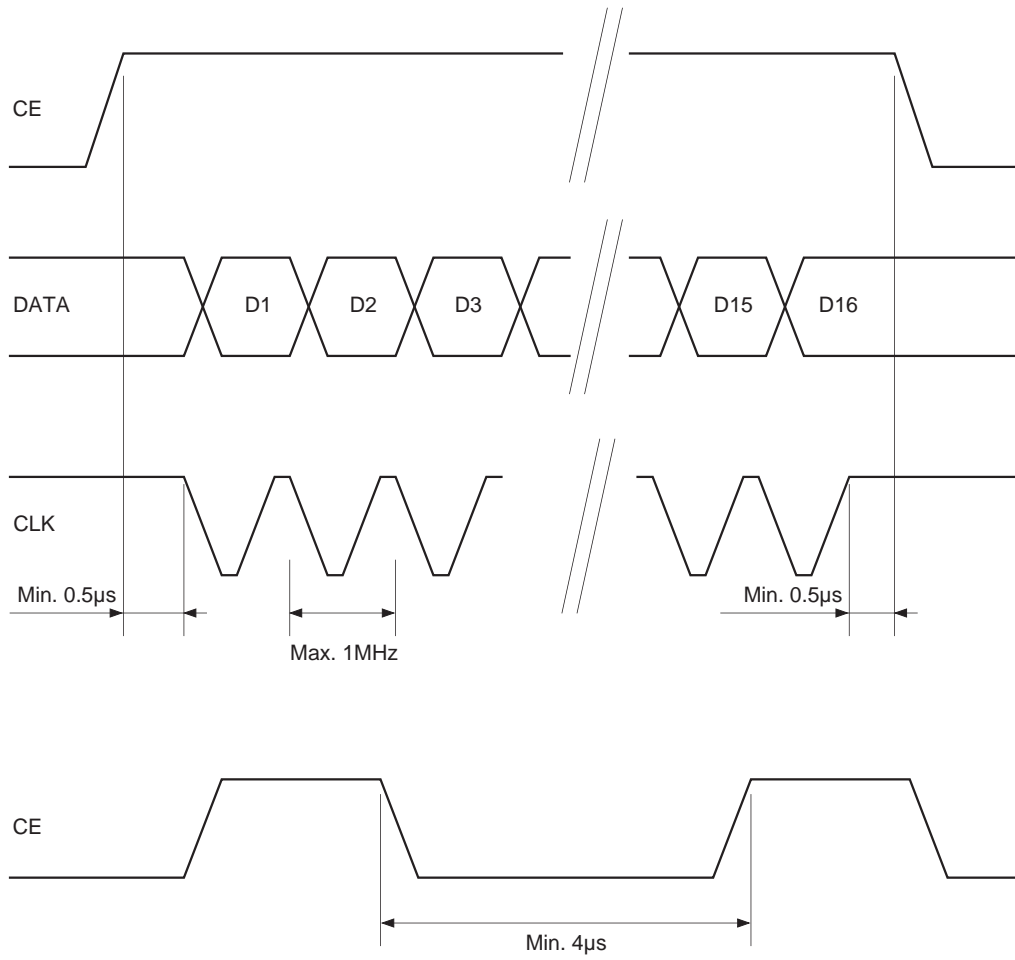
VRC1/VRC2

Setting	D2/D10	D3/D11	D4/D12	D5/D13
0	1	1	1	1
-8	1	1	1	0
-16	1	1	0	1
-24	1	1	0	0
-32	1	0	1	1
-40	1	0	1	0
-48	1	0	0	1
-56	1	0	0	0
-64	0	1	1	1
-72	0	1	1	0
-80	0	1	0	1
-∞	0	1	0	0
-∞	0	0	0	0

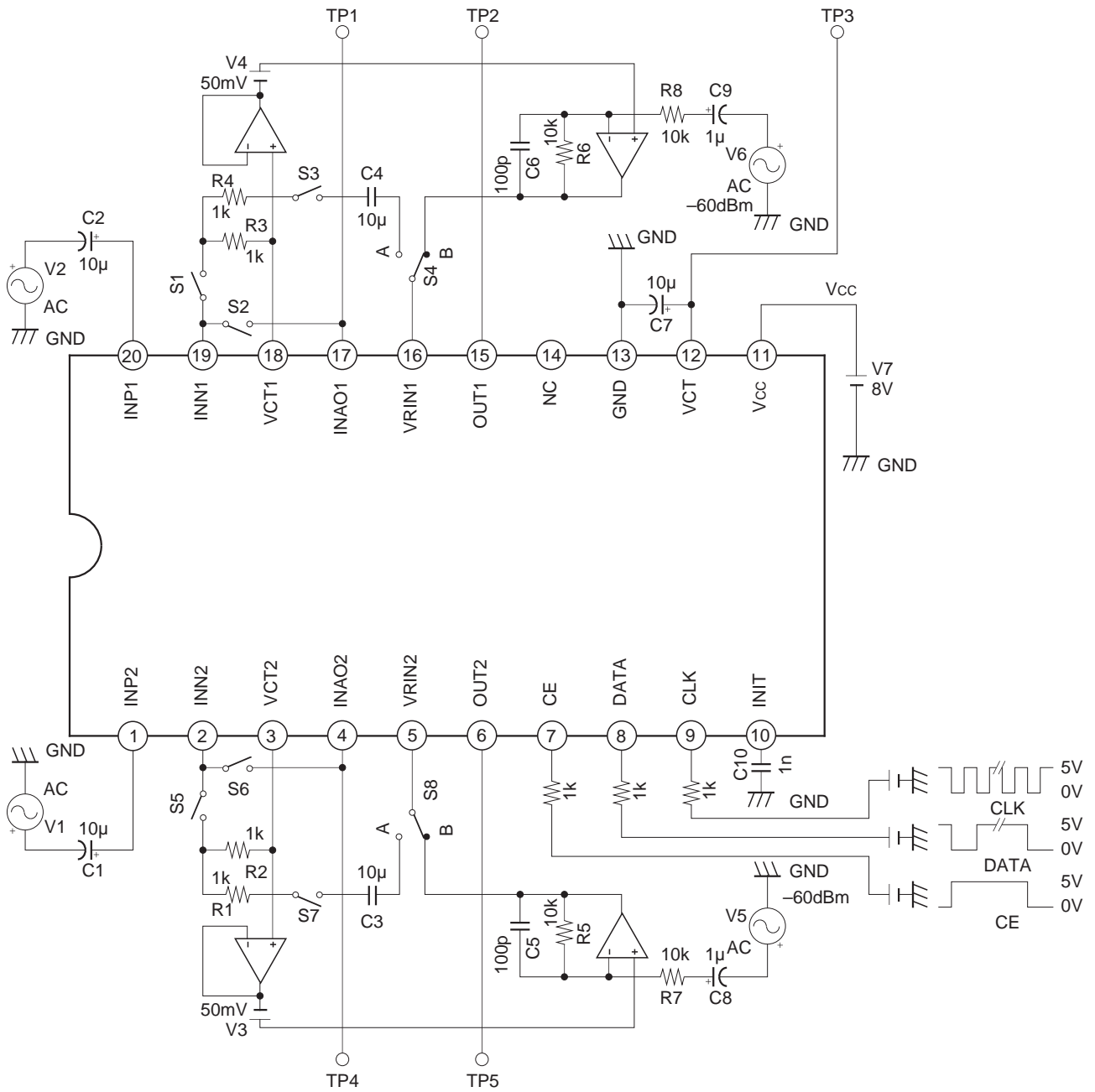
VRF1/VRF2

Setting	D6/D14	D7/D15	D8/D16
0	1	1	1
-1	1	1	0
-2	1	0	1
-3	1	0	0
-4	0	1	1
-5	0	1	0
-6	0	0	1
-7	0	0	0

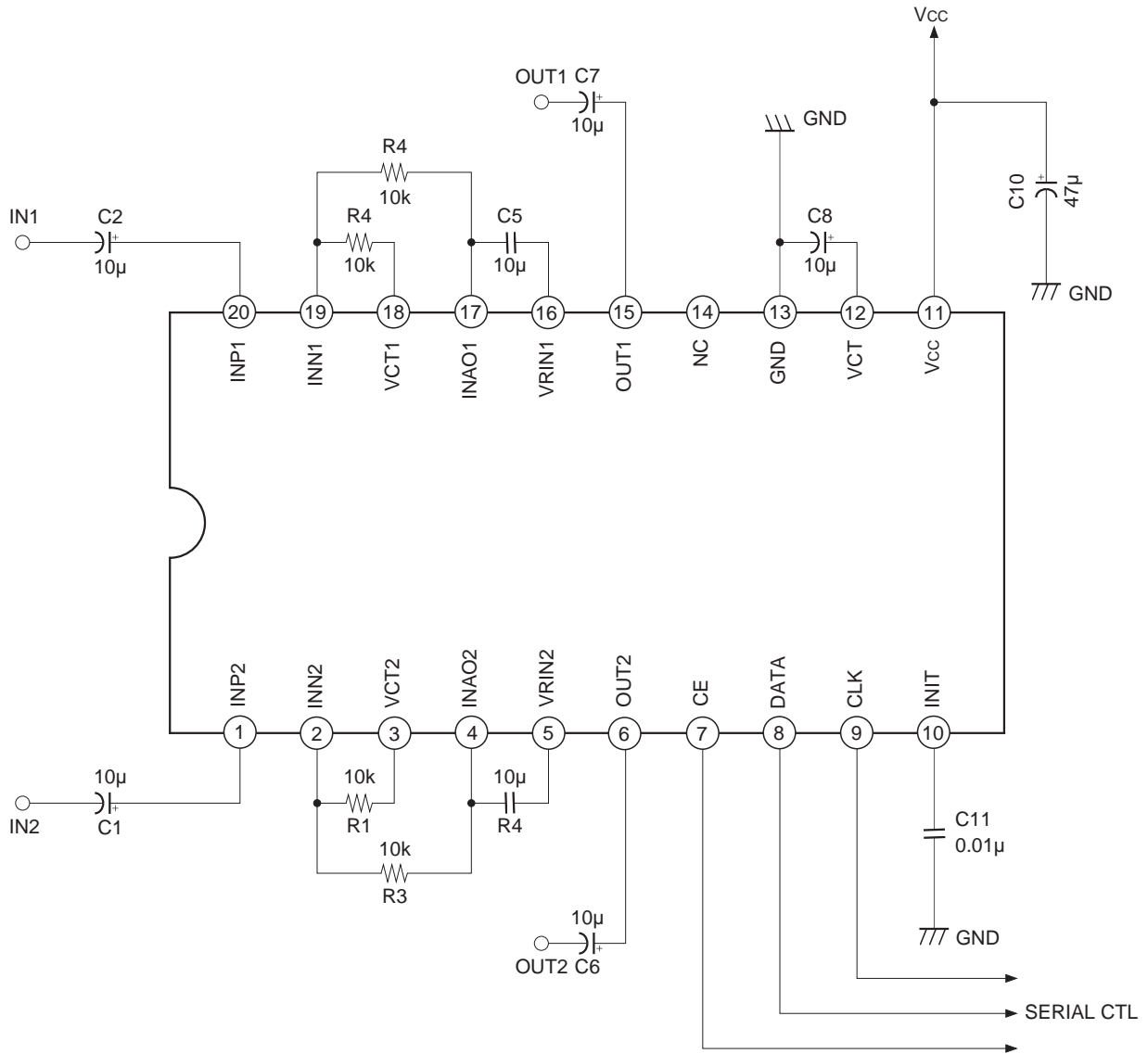
Data Timing



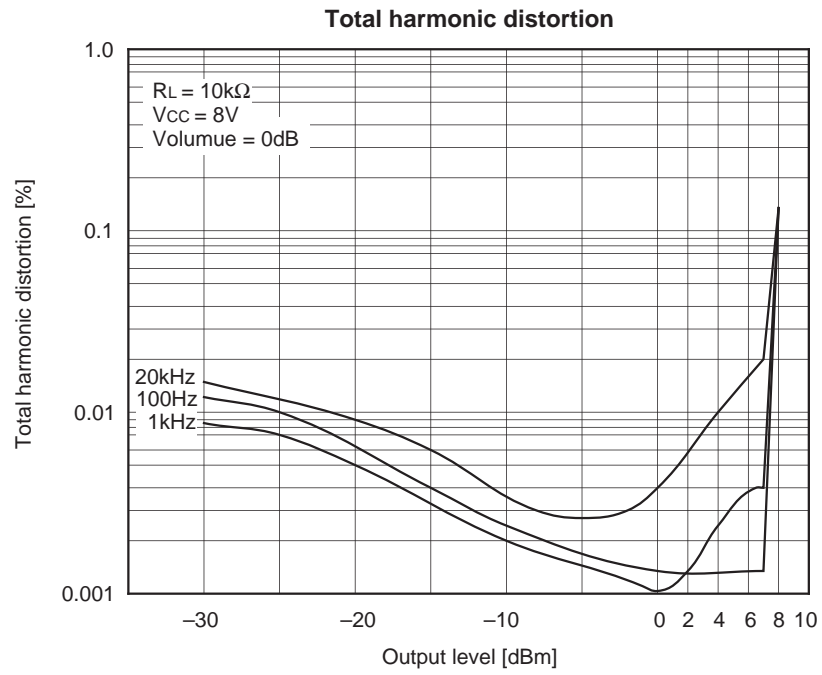
Test Circuit



Application Circuit

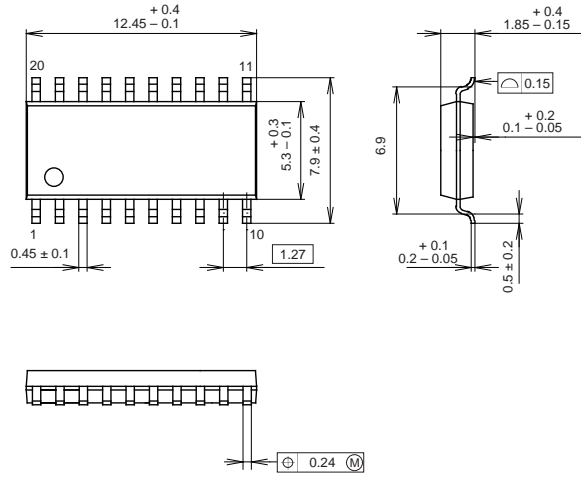


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Package Outline Unit : mm
CXA1846AM

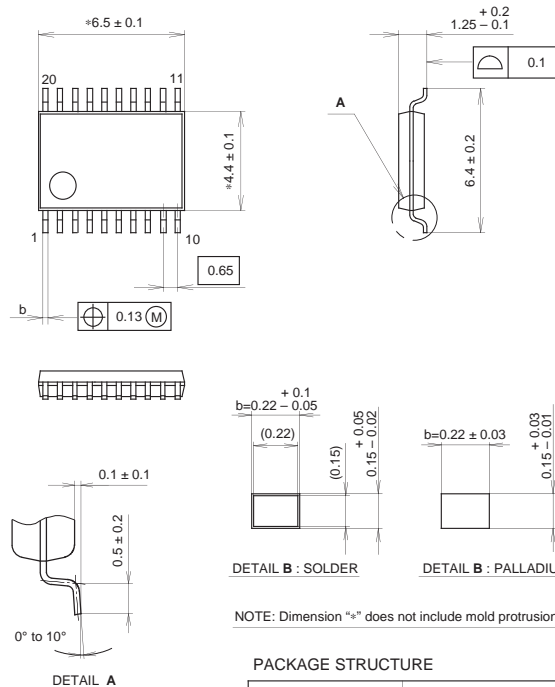
20PIN SOP (PLASTIC)



SONY CODE		PACKAGE STRUCTURE	
SONY CODE	SOP-20P-L01	PACKAGE MATERIAL	EPOXY RESIN
EIAJ CODE	SOP020-P-0300	LEAD TREATMENT	SOLDER PLATING
JEDEC CODE		LEAD MATERIAL	COPPER ALLOY
		PACKAGE MASS	0.3g

CXA1846AN

20PIN SSOP (PLASTIC)



SONY CODE		PACKAGE STRUCTURE	
SONY CODE	SSOP-20P-L01	PACKAGE MATERIAL	EPOXY RESIN
EIAJ CODE	SSOP020-P-0044	LEAD TREATMENT	SOLDER / PALLADIUM PLATING
JEDEC CODE		LEAD MATERIAL	42/COPPER ALLOY
		PACKAGE MASS	0.1g

NOTE : PALLADIUM PLATING
This product uses S-PdPPF (Sony Spec.-Palladium Pre-Plated Lead Frame).