BIPOLAR ANALOG INTEGRATED CIRCUIT
μPC666

3 CHANNEL D/A CONVERTER FOR VIDEO PROCESSING

DESCRIPTION

μPC666 is a video 6-bit 3-channel digital analog converter having the following features: High speed and high precision bipolar processing technology for excellent performance of 35 MHz, ±0.5 LSB (MAX.); three channels of identical digital analog converters; power consumption minimized to 175 mW (TYP.); because the three channels are laid out on the same chip, little deviation among the converters, ideal for processing RGB, R−Y, B−Y, and Y signals, where strict deviation control is essential; and reference voltage generating circuit for simplified circuit configuration.

FEATURES

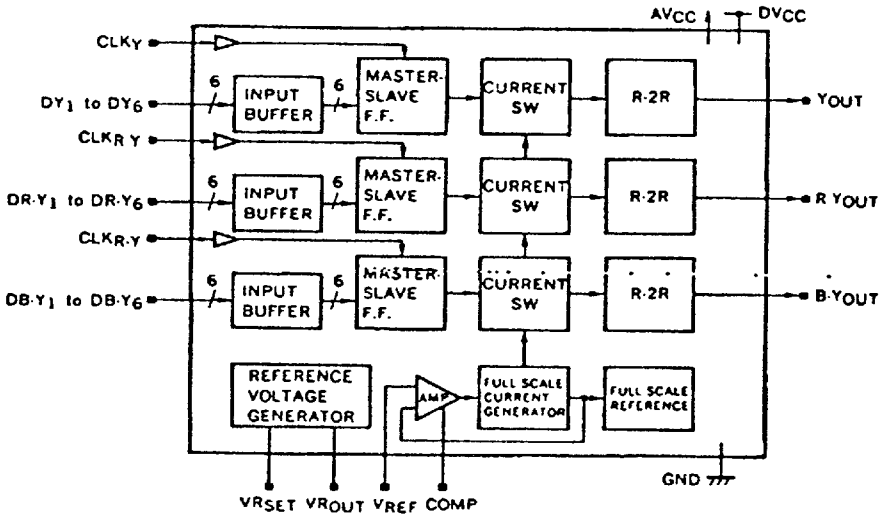
- 6-bit digital analog converter
- Clock rate: 35 Msps
- Conversion precision: ±0.5 LSB (MAX.)
- 5 V single power supply
- 3 channels incorporated
- Reference voltage generating circuit incorporated
- Power consumption: 175 mW (TYP.)

ORDERING INFORMATION

PART NUMBER	PACKAGE	QUALITY GRADE
μPC666GS	36 Pin Plastic SOP (300 mil)	Standard

Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

BLOCK DIAGRAM



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ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Power Voltage	AV_{CC}, DV_{CC}	−0.3 to +6.0	V
Pin Input Voltage	V_{IN}	−0.3 to V_{CC} +0.3	V
Operation Temperature Range	T_{opt}	−20 to +75	°C
Storage Temperature Range	T_{stg}	−40 to +125	°C
Package Allowable Loss	P_D	560	mW

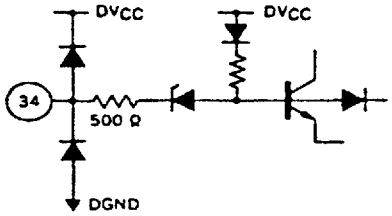
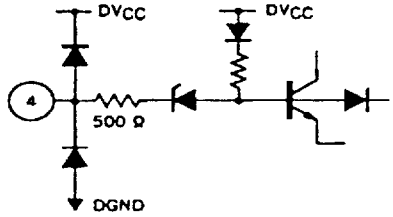
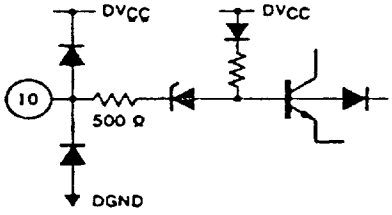
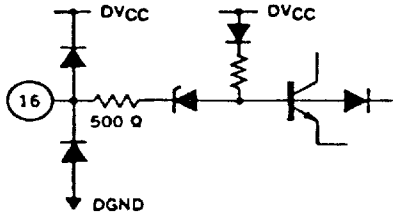
RECOMMENDED OPERATING CONDITIONS (T_a = −20 to +75 °C)

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Power Voltage	AV_{CC}, DV_{CC}	4.75	5.0	5.25	V	AGND = DGND = 0
Analog Reference Voltage	V_{REF}	3.70	4.00	4.30	V	
Digital Input High Level Voltage	V_{INDH}	2.0	–	–	V	
Digital Input Low Level Voltage	V_{INDL}	–	–	0.8	V	
Sampling Frequency	f_{samp}	–	–	35	MHz	
Data Input Set Up Time	t_s	15.0	–	–	ns	
Data Input Hold Time	t_h	4.0	–	–	ns	
Sampling Clock High Pulse Width	t_{PWH}	10		1000	ns	
Sampling Clock Low Pulse Width	t_{PWL}	10		1000	ns	
Compensation Capacity	C_{comp}	1.0	–	–	μF	

ELECTRIC CHARACTERISTICS (T_a = −20 to +75 °C, AV_{CC} = DV_{CC} = 5±0.25 V)

ITEM	SYMBOL	MIN.	TYP.	MAX	UNIT	TEST CONDITIONS
Power Consumption	I_{CC}		35	49	mA	T_a = 25 °C
Integral Linearity Error	ILE			±0.5	LSB	T_a = 0 to +75 °C
Differential Linearity Error	DLE			±0.5	LSB	T_a = 0 to +75 °C
Output Voltage Full-Scale Precision	V_{OFS}	0.836	0.984	1.132	V	AV_{CC} = DV_{CC} = 5.0 V, V_{REF} = 4.0 V This precision is the difference between the full-scale output voltage and zero-scale output voltage.
RGB Output Voltage Ratio	FSR	−0.8	0	+0.8	%	
Reference Power Supply Output Voltage	V_{ROUT}	3.8	4.0	4.2	V	AV_{CC} = DV_{CC} = 5.0 V
Output Delay Time	t_D		15	25	ns	
Setting Time	t_{SET}		25	40	ns	C_L = 5 pF

DESCRIPTION OF PINS

PIN NO.	EQUIVALENT CIRCUIT	FUNCTIONS
34, 35, 36, 1, 2, 3		34 : Y channel digital input (MSB) 35 : Y channel digital input (2nd) 36 : Y channel digital input (3rd) 1 : Y channel digital input (4th) 2 : Y channel digital input (5th) 3 : Y channel digital input (LSB)
4, 5, 6, 7, 8, 9		4 : R–Y channel digital input (MSB) 5 : R–Y channel digital input (2nd) 6 : R–Y channel digital input (3rd) 7 : R–Y channel digital input (4th) 8 : R–Y channel digital input (5th) 9 : R–Y channel digital input (LSB)
10, 11, 12, 13, 14, 15		10 : B–Y channel digital input (MSB) 11 : B–Y channel digital input (2nd) 12 : B–Y channel digital input (3rd) 13 : B–Y channel digital input (4th) 14 : B–Y channel digital input (5th) 15 : B–Y channel digital input (LSB)
16, 17, 18		16 : B–Y channel clock input 17 : R–Y channel clock input 18 : Y channel clock input
20, 33		Digital power pin

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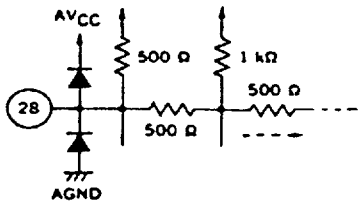
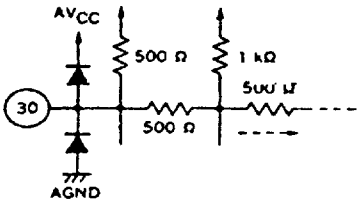
PIN NO.	EQUIVALENT CIRCUIT	FUNCTIONS
28		R–Y signal output pin. The output resistance is approx 333 Ω (TYP.)
30		Y signal output pin. The output resistance is approximately 333 Ω (TYP.).
19, 27, 29, 31		Grounding pin

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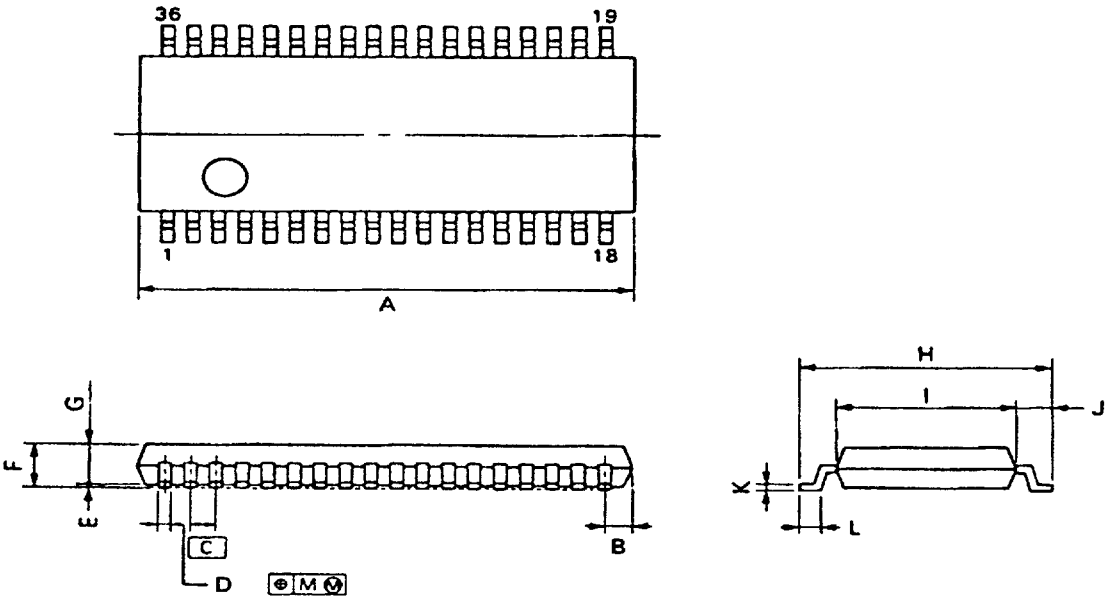
36 PIN PLASTIC SHRINK SOP(300mil)



P36GM-80-300B-1

ITEM	MILLIMETERS	INCHES
A	15.54 MAX.	0.612 MAX.
B	0.97 MAX.	0.039 MAX.
C	0.8 (T.P.)	0.031 (T.P.)
D	$0.35^{+0.10}_{-0.05}$	$0.014^{+0.004}_{-0.003}$
E	0.1 ± 0.1	0.004 ± 0.004
F	1.8 MAX	0.071MAX.
G	1.55	0.061
H	7.7 ± 0.3	0.303 ± 0.012
I	5.6	0.220
J	1.1	0.043
K	$0.20^{+0.10}_{-0.05}$	$0.008^{+0.004}_{-0.003}$
L	0.6 ± 0.2	$0.024^{+0.008}_{-0.009}$
M	0.10	0.004

NOTE
Each lead centerline is located within 0.10 mm (0.004 inch) of its true position (T.P.) at maximum material condition.

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