

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

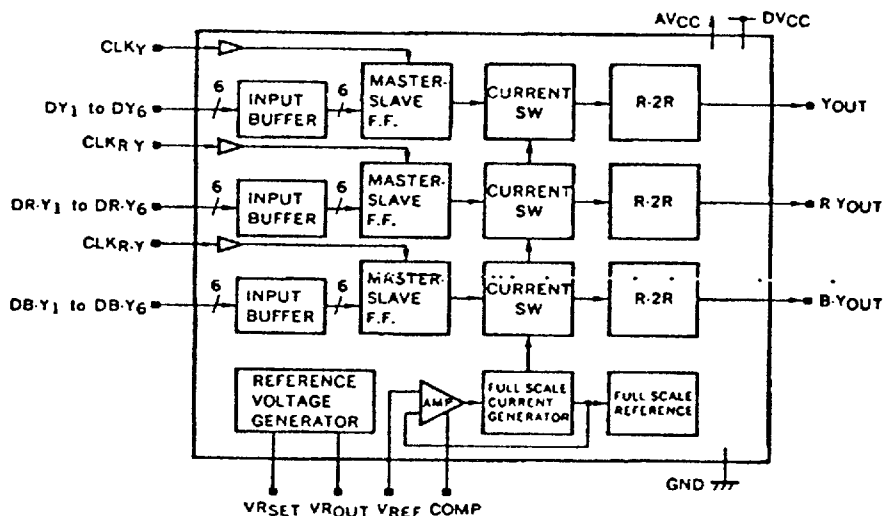
- 6-bit digital analog converter
- Clock rate: 35 Msp/s
- Conversion precision: ±0.5 LSB (MAX.)
- 5 V single power supply
- 3 channels incorporated
- Reference voltage generating circuit incorporated
- Power consumption: 175 mW (TYP.)

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



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)

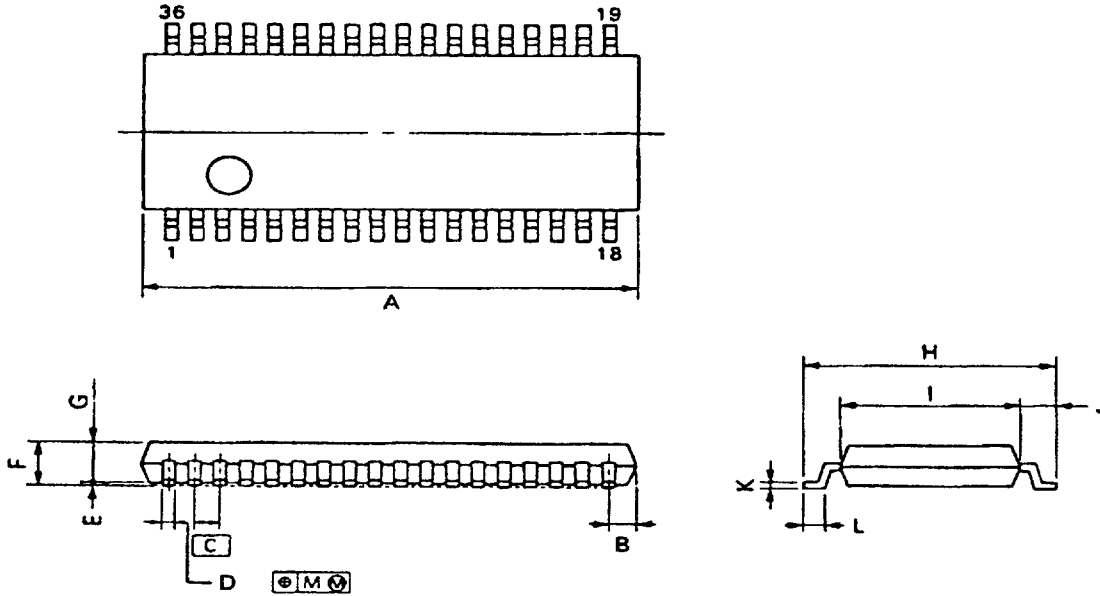
ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Power Consumption	I _{CC}		35	49	mA	T _a = 25 °C
Integral Linearity Error	I _{LE}			±0.5	LSB	T _a = 0 to +75 °C
Differential Linearity Error	D _{LE}			±0.5	LSB	T _a = 0 to +75 °C
Output Voltage Full-Scale Precision	V _{OFS}	0.836	0.984	1.132	V	AV _{CC} = 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	+8.0	%	
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		<p>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)</p>
4, 5, 6, 7, 8, 9		<p>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)</p>
10, 11, 12, 13, 14, 15		<p>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)</p>
16, 17, 18		<p>16 : B-Y channel clock input 17 : R-Y channel clock input 18 : Y channel clock input</p>
20, 33		<p>Digital power pin</p>

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

36 PIN PLASTIC SHRINK SOP(300mil)



NOTE

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

P38GM-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 ± 0.02	0.014 ± 0.001
E	0.1 ± 0.01	0.004 ± 0.001
F	1.8 MAX.	0.071 MAX.
G	1.55	0.061
H	7.7 ± 0.2	0.303 ± 0.012
I	5.6	0.220
J	1.1	0.043
K	0.20 ± 0.02	0.008 ± 0.001
L	0.6 ± 0.2	0.024 ± 0.008
M	0.10	0.004

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