ROHM

BU2087FV

2 Ch constant current driver

BU2087FV is a 2 channel constant current driver designed to drive the tape head capstan of new standard film video cameras.

The IC has two independent constant current drivers, with an on-board logic control circuit. The output drive current of each circuit can be independently set by varying the input voltage or changing the value of an external resistor.

Features

- SSOP B-16 package
- with two separate channels in a single package, it has a very small mounting area
- current consumption as low as 3 mA when at full output
- output current is very stable and constant
- each channel can be individually controlled

- highly resistant to electrostatic discharges

Applications

- still camera, video cameras and small motors

Dimensions (Units : mm)

SSOP B-16
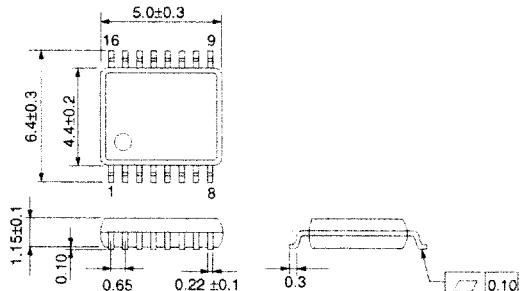
Absolute maximum ratings (T_a = 25°C) (Sheet 1 of 2)

Parameter	Symbol	Limits	Unit	Conditions
Power supply voltage	V_{DD}	−0.3 ~ +7.0	V	
Supply voltage	V_{bat}	−0.3 ~ +7.0	V	
Power dissipation	P_d	350	mW	Reduce power by 3.5 mW/°C for each degree above 25°C
		400		When mounted on 90 x 50 x 1.6 mm glass epoxy board, reduce power by 4.0 mW/°C for each degree above 25°C.
Operating temperature	T_{opr}	−30 ~ +75	°C	

Absolute maximum ratings (T_a = 25°C) (Sheet 2 of 2)

| Parameter	Symbol	Limits	Unit	Conditions
Storage temperature	T_{stg}	−55 ~ +125	°C	
Input voltage	V_{IN}	V_{SS} − 0.3 ~ V_{DD} +0.3	V	
Output current	I_O	0 ~ 75	mA	

Note: Absolute maximum values can be applied without damaging the unit. These values do not guarantee operation.

Recommended operational power supply (V_{SS} = 0 V)

Parameter	Symbol	Limits	Unit
Power supply voltage	V_{DD}	+3.0 ~ +5.5	V
Supply voltage	V_{bat}	+1.4 ~ +6.5	V

Note: Not designed for radiation resistance

Block diagram

ROHM
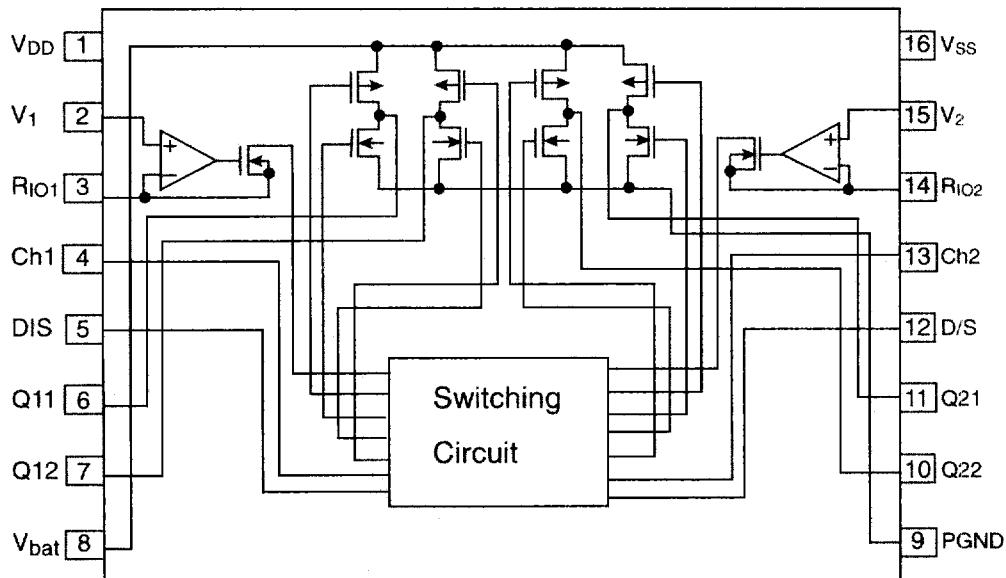
Input/output circuits

A) IN BUFFER (Ch1, Ch2, DIS, D/S) **B)** IN BUFFER ($V_1 \sim V_2$)
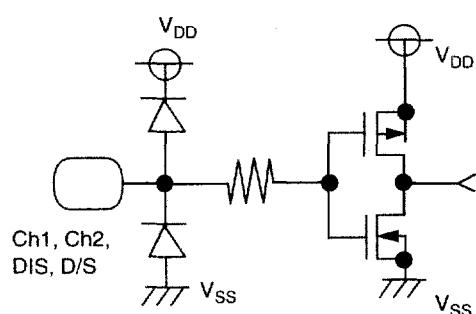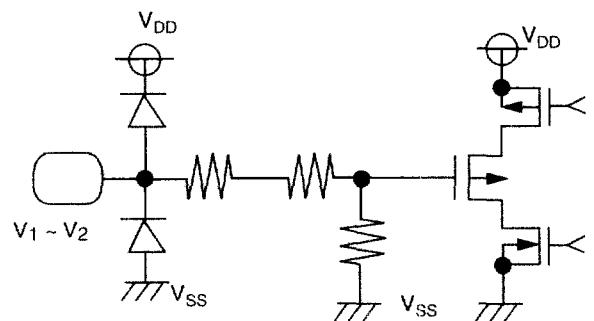
C) OUTPUT (Q11, Q12, Q21, Q22)
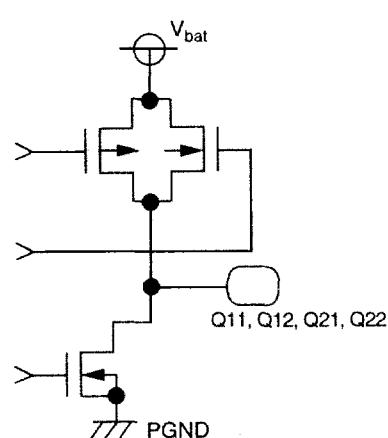
D) IN BUFFER (RI_{01}, RI_{02})
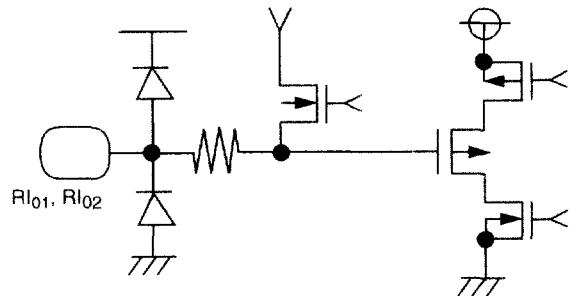
Pin description

Pin #	Symbol	I/O	Description
1	V_{DD}		Power supply
2	V_1	I	Ch 1 output current setting pin
3	RI_{O1}	I	Ch 1 current setting resistor
4	Ch1	I	Ch 1 output current setting "H"$Q_{11}gQ_{12}$, "L" $Q_{12}gQ_{11}$, resistor connection
5	DIS	I	Output enable/disable
6	Q11	O	Ch 1 driver output
7	Q12	O	Ch 1 driver output
8	V_{bat}		Output system power
9	PGND		Output system GND
10	Q22	O	Ch 2 output driver
11	Q21	O	Ch 2 output driver
12	D/S	I	Output channel switching pin. Selects Ch 1 & 2 @ "H", selects Ch 1 @ "L"
13	Ch2	I	Ch 2 output current setting "H"$Q_{21}gQ_{22}$, "L" $Q_{22}gQ_{21}$ resistor connection
14	RI_{O2}	I	Ch 2 current setting resistor pin
15	V2	I	Ch 2 output current setting
16	V_{SS}		GND

Figure 1 Recommended circuit

BU2087FV (1/2)

Circuit for 1 ch only
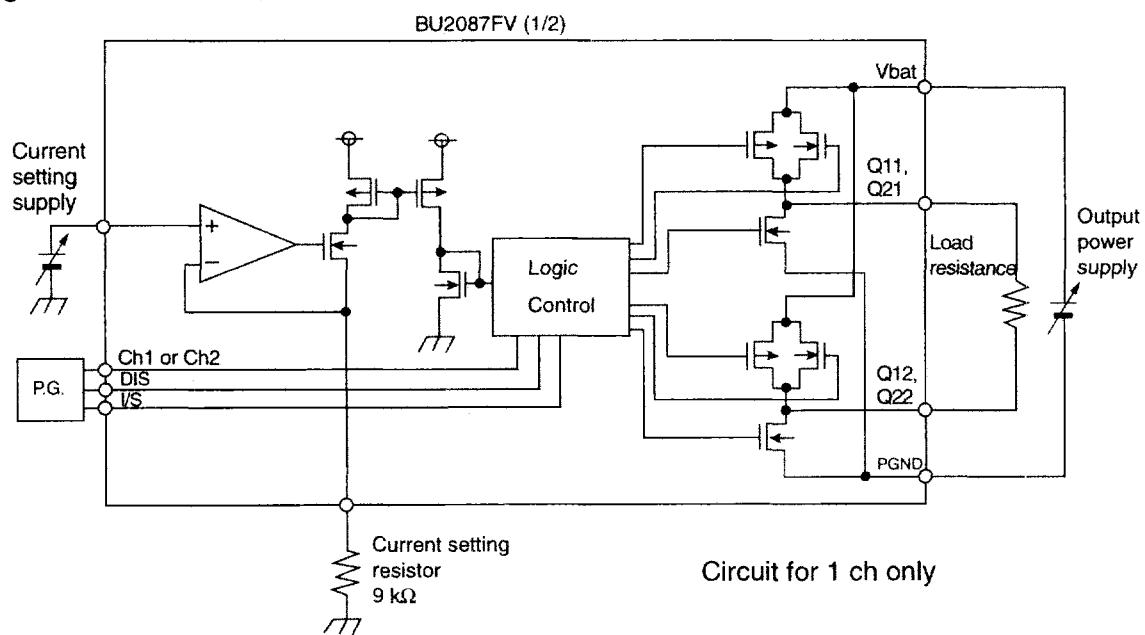
DC characteristics (unless otherwise noted, $V_{DD} = 5$ V, $V_{SS} = 0$ V, $T_a = 25°C$)

Parameter	Pin Name	Symbol	Rating			Units	Notes
			Min	Typ	Max		
"H" input voltage	Ch1, Ch2, DIS, D/S	V_{IH}	3.5	–	–	V	
"L" input voltage	Ch1, Ch2, DIS, D/S	V_{IL}	–	–	1.5	V	
"H" input current	Ch1, Ch2, DIS, D/S	I_{IH}	–	–	0.5	μA	
"L" input current	Ch1, Ch2, DIS, D/S	I_{IL}	–0.5	–	–	μA	
"H" input current	V1, V2	I_{IH}	10	35	75	μA	
"L" input current	V1, V2	I_{IL}	–0.5	–	–	μA	
Output current temperature variance	Q11, Q12 Q21, Q22	I_O	–	±3.0	–	%	V1, V2 = V_{DD}, V_{bat} = V_{DD} R_{IO} = 9 kΩ, –30 ~ +75°C
Output current	Q11, Q12 Q21, Q22	I_O	70.0	75.0	–	mA	V1, V2 = V_{DD}, V_{bat} = V_{DD} R_{IO} = 9 kΩ
			65.0	70.0	–		V1, V2 = V_{DD}, V_{bat} = 2.0 V R_{IO} = 9 kΩ
"H" output current disable	Q11, Q12 Q21, Q22	I_{OZH}	–0.5	–	0.5	μA	DIS = V_{SS}
Current consumption	V_{DD}	I_{DD}	–	–	0.3	mA	V1, V2, DIS = V_{SS}
			–	–	3.0		V1, V2, DIS, D/S = V_{DD} I_O = 75 mA
Current consumption	V_{bat}	I_{bat}	–	–	0.1	μA	V_{DD}, V1, V2, DIS, = V_{SS} V_{bat} = 6.5 V
			–	–	I_O X 2	mA	V1, V2 = V_{DD}, DIS = V_{DD}, D/S = V_{DD}

Switching characteristics (unless otherwise noted, $V_{DD} = 5$ V, $V_{SS} = 0$ V, $T_a = 25°C$)

Parameter	Symbol	Rating			Units	Notes
		Min	Typ	Max		
Output lag time (Ch$_x$ g OUTPUT)	$t_{PLH}1$	–	–	0.2	μs	R_L = 36 Ω C_L = 10 pF
	$t_{PHL}1$	–	–	0.2		R_L = 36 Ω C_L = 10 pF
Output lag time (Ch$_x$ g OUTPUT)	$t_{PLH}2$	–	–	2.0	μs	R_L = 36 Ω C_L = 10 pF
	$t_{PHL}2$	–	–	2.0		R_L = 36 Ω C_L = 10 pF
Output disable time (DIS g OUTPUT)	t_{PHZ}	–	–	2.0	μs	R_L = 36 Ω C_L = 10 pF
	t_{PZH}	–	–	2.0		R_L = 36 Ω C_L = 10 pF

DC current characteristic measurement circuit

### Figure 2 Current consumption/measurement circuit
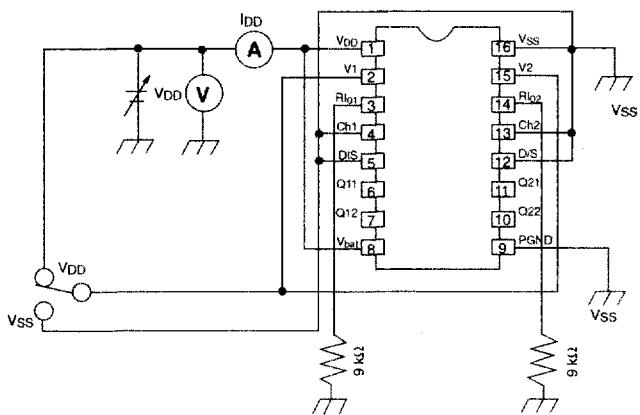
### Figure 3 Output current/measurement circuit
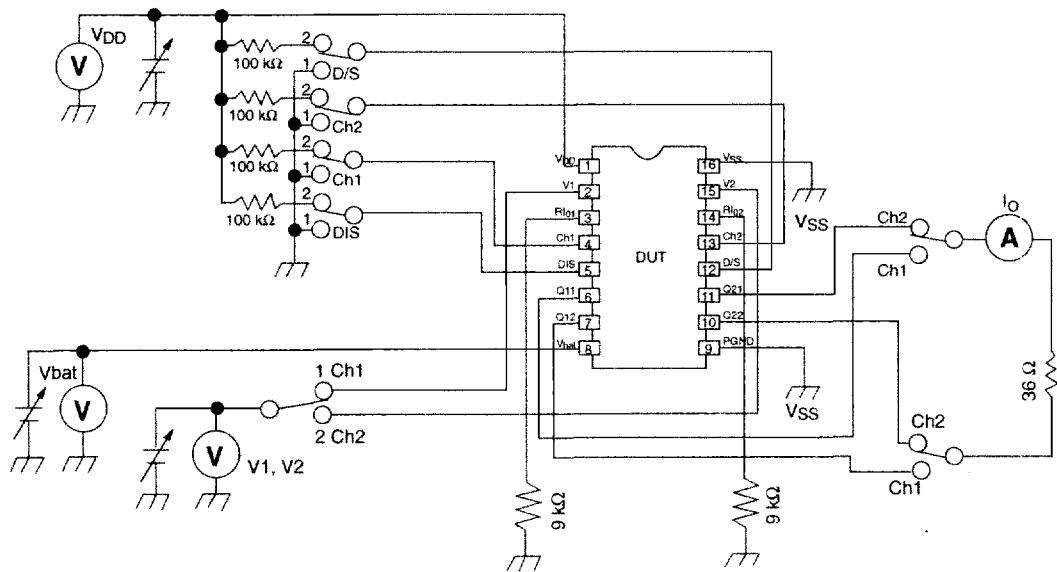
Figure 4 Input voltage/ measurement circuit
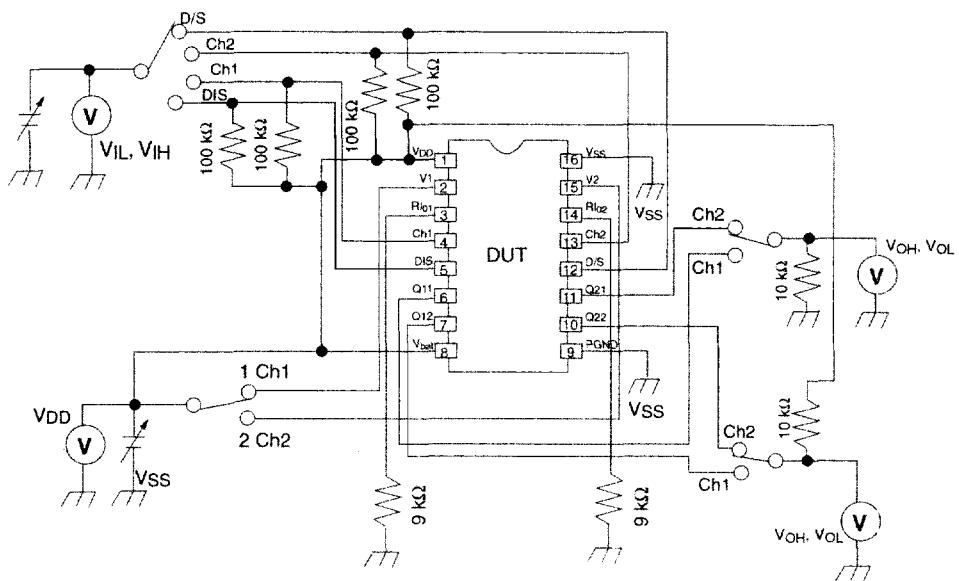

## Figure 5 Input current/measurement circuit
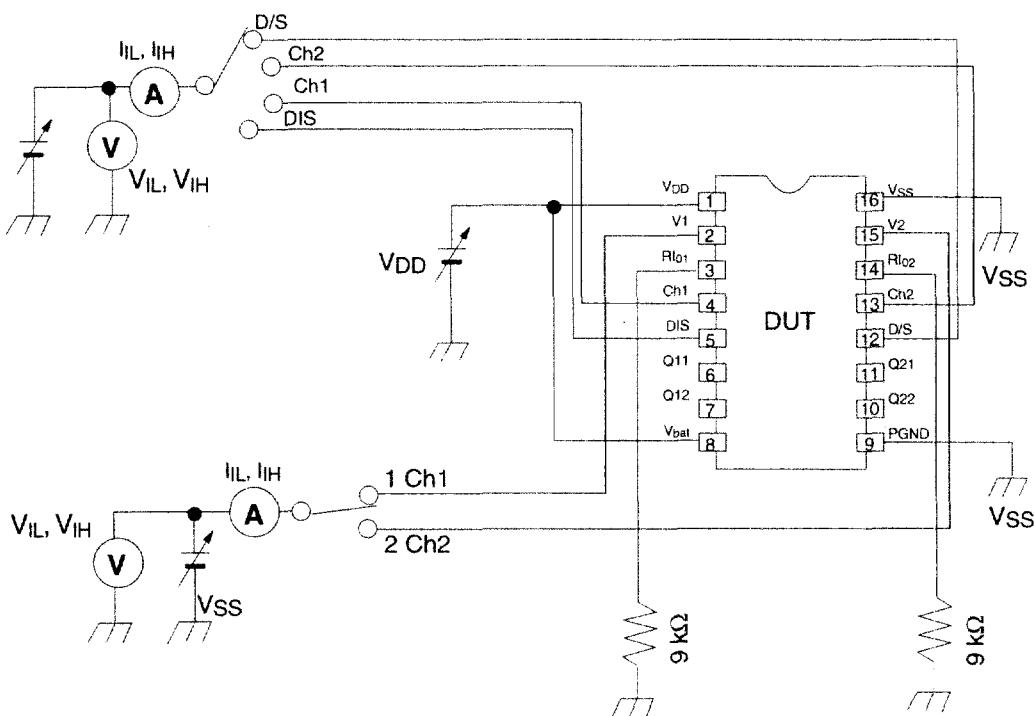
Figure 6 Switching time/measurement circuit
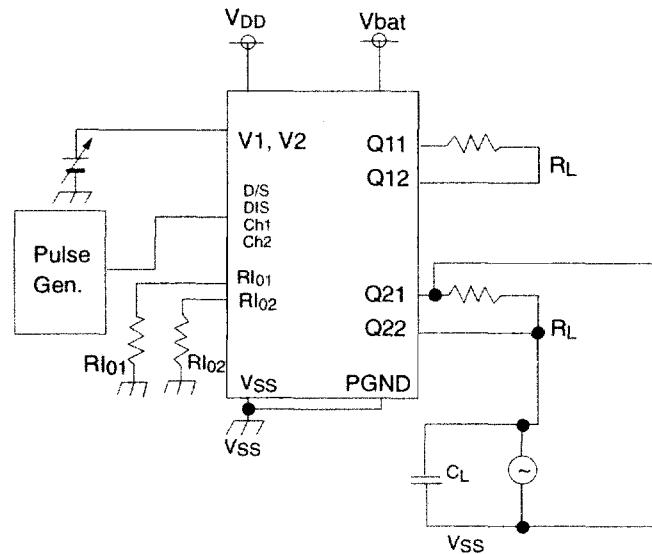
## Figure 7 Switching waveform characteristics
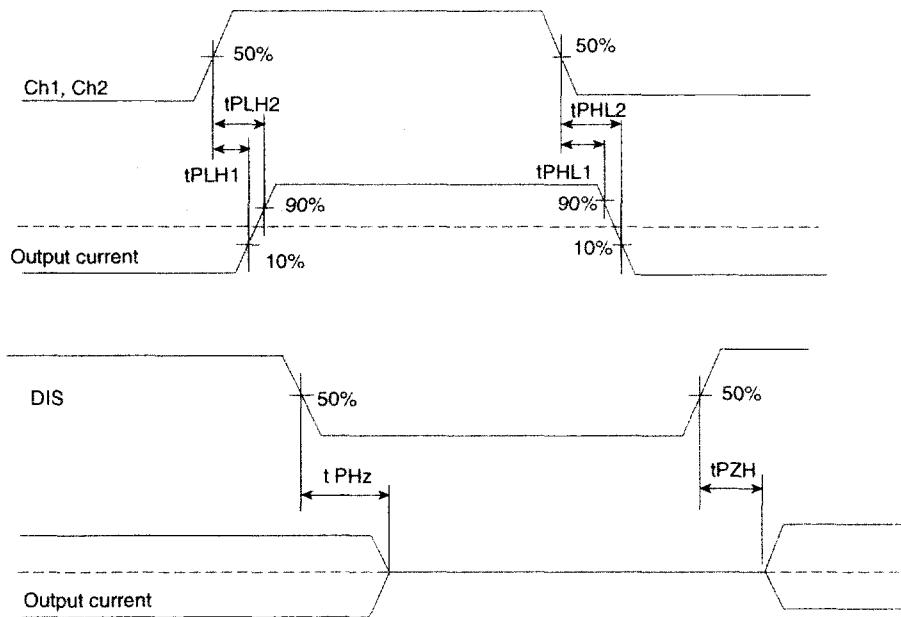
Figure 8 Application circuit

C1, C2	:0.1 μF ceramic capacitor
D1 ~ D8	:RB100A Schottky barrier diode
RI $_{01}$, RI $_{02}$	:9 kΩ
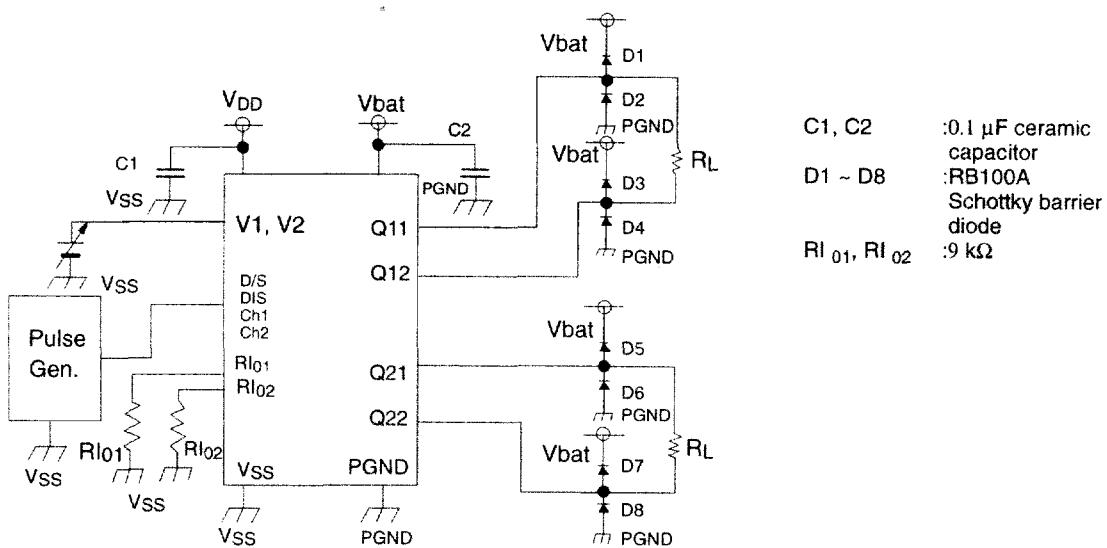
Precautions

1 Make allowance for single unit power
$T_a = 25°C$
350 mW +(Ch 1 I_O × [V_{bat} ~ V_{load}])
　　　+(Ch 2 I_O × (V_{bat} ~V_{load}))
P_d <350 mW, $P_d = I_{IA}$ × V_{DD}
Set V_{bat} to insure correct P_d

2 Output current
$I_O = (V_1/R_{10})$ × 150

V_1: V_{IN}
R_{I0}: External Resistance
I_O: Output current

3 Assure that during connection the output pins do not have a reverse voltage in excess of the maximum value. A protection circuit should be implemented in order to avoid damage to the unit.

Ordering information

When ordering these parts, ROHM requires the following information:

- Basic part number
- Taping code (the device may be available in a number of different tape formats on a reel, ammo box, or tube, or it may be available in bulk form packaged in a bag).

The part number that ROHM gives your device is constructed as follows. When reordering parts, please keep this number in your records so that you can be assured of receiving the correct products on each order:

Part no.

| B | U | 2 | 0 | 8 | 7 | F | V | | | E | 2 | |

Basic part no.

Packaging code

Code	Packaging specs	Direction	Unit/pcs
E1	Embossed tape & reel	Pin 1 fed first	2 500
E2		Pin 1 fed last	2 500
T1	Paper tape & reel	Pin 1 fed first	2 000
T2		Pin 1 fed last	2 000

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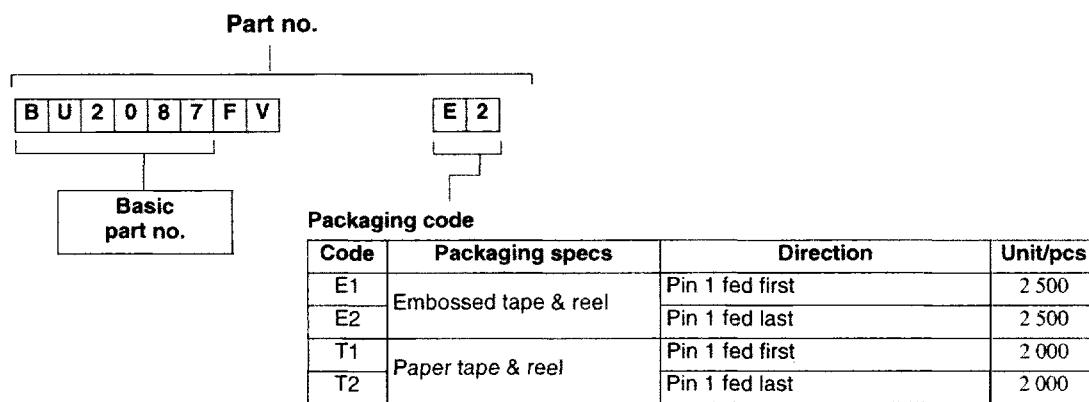
Silicon Monolithic IC

Disclaimer

The parts listed in this technical data sheet are designed to be used with ordinary electronic equipment or devices (such as audio-visual equipment, office-automation equipment, communications devices, and electrical appliances).

Should you intend to use this product with equipment or devices which require an extremely high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers, or other safety devices), please be sure to consult with our sales representatives in advance.

Application circuit diagrams and circuit constants contained in this technical data sheet are shown as examples of standard use and operation. Please pay careful attention to the peripheral conditions when designing circuits and deciding upon circuit constants in the set.

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The product(s) described in this technical data sheet are not designed to be X-ray proof.

ROHM
MARKETING
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June 19, 1998 3:12 pm
BU2087FV

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