Infrared Remote Solutions Inc.

IR117
RS-1™ Remote Control IC

FEATURES

- RS-1™ long-range IR protocol - 10m minimum indoor range
- No crystal or resonator needed - nor timing resistors or capacitors
- Minimal support components – a complete 32-key remote requires a total of 8 components (excluding the key matrix and batteries)
- Supports up to 56 keys with the addition of 6 diodes
- Transmit LED indicator
- Backlight control output - keeps backlight lit for 60 seconds
- Over 65,000 unique manufacturer/product ID codes available
- Very small footprint – industry standard 150mil SOIC
- Advanced signal multiplexing yields a very small device - just 14 pins
- Less than 200nA sleep current
- Electrically quiet – no clock nor keypad scanning during sleep
- Extended industrial temperature range: -40°C to +125°C
- Extended supply range: 2.0V to 5.5V

DESCRIPTION

The IR117 is a state-of-the-art controller IC for handheld remote controls. Utilizing a precision, on-chip oscillator it needs no external crystal, resonator or other clock source. The IR117 includes internal pull-up resistors to eliminate even more compents that are needed for typical remote control ICs. In fact, a complete 32-key remote control can be constructed with just 8 components (excluding the keypad matrix and battery contacts).

The IR117 is a very low power, electrically quiet device dissipating just 500nW when waiting for keypresses. In this state, the on-chip oscillator is stopped to reduce noise and further reduce power consumption. When sending it dissipates just 450uW. This means extremely long battery life even when operating with small battery cells; for example: a pair of AAA cells.

The IR117 uses the RS-1™ infrared communications protocol to for long distance, accurate transmission of keypress information. A range of 10m indoors is achievable even with inexpensive driver transistors and IR emitters. The RS-1™ protocol has been designed to allow for over 65,000 unique manufacterer and/or product IDs. Other popular IR protocols as well as custom protocols are also available. Please call for details

ORDERING INFORMATION

IR117D Standard Version, 14-pin DIP (300mil)

IR117SO Standard Version, 14-pin SOIC (150mil)

Availability: *NOW*

Standard version ships with manufacterer's ID code of 0x0101. Contact the sales office to obtain a unique ID code.

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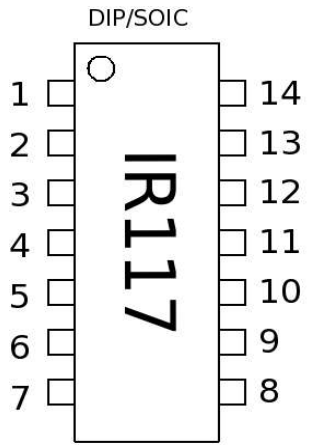
PIN ASSIGNMENT



PIN	Signal	Type	Description
1	VDD	Power	Positive supply
2	SC6/BKL	Output	Scan/backlight driver
3	SE3	Input	Sense input
4	SE2	Input	Sense input
5	SC5	Output	Scan driver
6	SC4	Output	Scan driver
7	SC3/LEDL	Output	Scan/LED driver
8	SC2	Output	Scan driver
9	SC1	Output	Scan driver
10	SC0/LEDH	Output	Scan/LED driver
11	SC7/IR	3-state	Scan/IR driver
12	SE1	Input	Sense input
13	SE0	Input	Sense input
14	VSS	Power	Negative supply

SIGNAL DESCRIPTION

SE0 through SE3 are keypad sense inputs. They are low-true. Each has an internal pull-up resistor in the range of approximately 20K ohms.

SC1, SC2, SC4 and SC5 are keyscan outputs. They are driven low while waiting for a keypress. When a keypress is detected, these outputs are cycled to detect which key has been pressed.

SC0 and SC3 are keyscan outputs and LED drivers. They are diven low while waiting for a keypress. They are cycled during keypress detection. During the IR output phase, these output drive an LED to indicate IR transmission.

SC6/BKL is a keyscan output and backlight driver. It is low while waiting for a keypress. It is cycled with the other keyscan signals to detect which key has been pressed. When not scanning keys, this output controls the optional backlight.

SC7/IR is a key a keyscan output and IR emitter driver. It is low while waiting for a keypress. It is cycled with other keyscan signals to detect which key has been pressed. After a keypress has been detected, this signal drives the IR emitter.

ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings

Parameter	***Value***
Temperature, Ambient	-40°C to +125°C
Temperature, Storage	-65°C to +150°C
VDD (with respect to VSS)	+7.0V
Inputs (with respect to VSS)	-0.3V to (V_{DD} + 0.3V)
Total Power Dissipation	500mW
Maximum Supply Current	150mA
Input Clamp Current	±20mA
Output Clamp Current	±20mA
Maximum Output Current, Sourced	25mA
Maximum Output Current, Sunk	25mA

DC Characteristics

Characteristic	***Symbol***	***Min***	***Typ***	***Max***	***Unit***
Operating Temperature	TOP	-40		125.0	°C
Operating Voltage	VDD	2.0		5.5	V
Supply Current, Sending	IDD		180.0	TBD	uA
Supply Current, Sleeping	IDDS		200.0	TBD	nA
Input Low Voltage	VIL	VSS		0.8	V
Input High Voltage	VIH	2.0		VDD	V
Input Leakage Current	IIL			±1.0	uA
Output Low Voltage	VOL			0.6	V
Output High Voltage	VOH	VDD-0.7			V

AC Characteristics

Characteristic	***Symbol***	***Min***	***Typ***	***Max***	***Unit***
Wake From Sleep	TWAKE		50		uS
Keypad Scan and Debounce	TSCAN		10		mS
IR Packet Transmit Time	TSEND	34.3		46.3	mS
IR Packet Repeat Interval	TRPT	98		102	mS
Sleep Timeout (after last keypress)	TSLP		60		S
Backlight Timeout (after last keypress)	TBKL		60		S
IR Carrier Frequency	IRF		38		KHz
IR Carrier Duty Cycle	IRDUTY		50		%