

● General Description

RPR-0521RS is a module which integrates optical proximity, digital ambient light sensor IC, and infrared LED (IrLED). Proximity sensor (PS) part detects the human or object approaching by the reflection of IrLED light. Ambient light sensor (ALS) part detects the wide range of illumination; from the dark environment to the direct sun light. The illuminant intensity of LCD display and keypad can be adjusted by using RPR-0521RS. It enables lowering current consumption and/or improving the visibility under the bright environment.

● Features

- 1) Compatible to I²C bus interface (f/s mode support)
- 2) Compatible to 1.8V logic interface
- 3) Low Current consumption by power down function/mode
- 4) There are two ALS outputs; peaks of spectrum responses are in visible light (Data0) and in infrared light (Data1) for calculating illuminance.
- 5) Correspond to very wide range of light intensity
- 6) Rejecting 50Hz/60Hz light noise (ALS function)
- 7) Detection range of proximity sensor is around 1 - 100mm (adjustable by I²C)
- 8) Built-in current configurable IrLED driver

● Application

Smart phone, Mobile phone, Digital Still Camera, Portable game, Camcorder, PDA, LCD display etc.

● Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Units
VDD Supply Voltage	Vddmax	4.5	V
SDA, SCL Terminal Voltage	Vsdamax, Vsclmax	4.5	V
LEDA, LDR, INT Terminal Voltage	Vledamax, Vldrmax, Vintmax	7	V
Operating Temperature	Topr	-25~85	°C
Storage Temperature	Tstg	-30~85	°C
INT, SDA Sink Current	I _{max}	7	mA

● Operating conditions

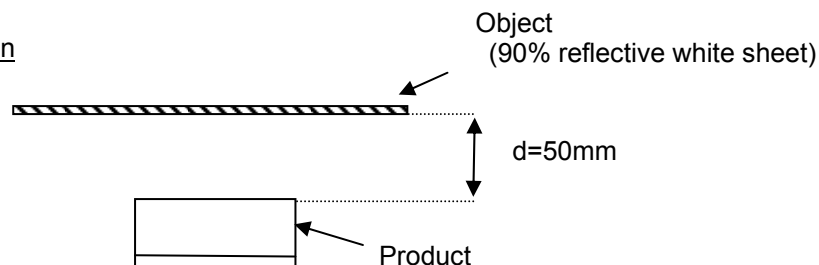
Parameter	Symbol	Min.	Typ.	Max.	Units
VDD Supply Voltage	Vdd	2.5	3.0	3.6	V
VLEDA Voltage	Vleda	2.8	3.0	5.5	V
INT Terminal Voltage	Vint	—	—	5.5	V

● Electrical characteristics

(VDD= 3.0V, Ta = 25°C, and all registers are default unless otherwise noted.)

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Supply current for ALS	Icc1	10	90	300	uA	EV = 10 lx*1 MODE_CONTROL(41h) =89h
Supply current for PS	Icc2	10	90	200	uA	MODE_CONTROL(41h) =49h
Standby mode current	Icc3	0.1	1.0	2.0	uA	MODE_CONTROL(41h)=00h, No input light
Calculated Lx	Lx	6	10	14	lx	EV = 10 lx*1 MODE_CONTROL(41h)=89h ALS_PS_CONTROL(42h)=02h
Dark (0 lx) Sensor out in TYPE0	SO_0	—	—	5	count	No input light MODE_CONTROL(41h)=89h ALS_PS_CONTROL(42h)=02h
Dark (0 lx) Sensor out in TYPE1	SO_1	—	—	5	count	No input light MODE_CONTROL(41h)= 89h ALS_PS_CONTROL(42h)=02h
PS sensor out (d=50mm ²)	PS50	48	80	112	count	MODE_CONTROL(41h)=49h LED current =100mA
PS sensor out (No proximity object)	PS0	—	—	10	count	Ambient irradiance = 0uW/cm ² MODE_CONTROL(41h)=49h LED current =100mA
ILED pulse duration 1	twILED 1	80	200	300	us	MODE_CONTROL(41h)=49h
ILED pulse duration 2	twILED 2	110	330	500	us	MODE_CONTROL(41h)=69h
LDR terminal sink current at LDR terminal voltage = 1.3V	ILED	22	25	28	mA	ALS_PS_CONTROL (42h) <1:0> = "00"
INT output 'L' Voltage	VINTL	0	—	0.4	V	lint = 3mA
SCL SDA input 'H' Voltage	VIH	1.26	—	—	V	
SCL SDA input 'L' Voltage	VIL	—	—	0.54	V	
SCL SDA input 'H'/'L'Current	IIHL	-10	—	10	uA	
I ² C SDA Output 'L' Voltage	VOL	0	—	0.4	V	lol = 3mA

*1 White LED is used as optical source. "Lx" is calculated from ADC count valus.

*2 Measuring Condition

Object: 90% reflective white sheet (50×50mm Kodak Gray Card Plus)

Distance between the object and the product is 50mm. No glass or apertures is above the product.