RS Data Library

Light dependent resistor

ø ENS CACHAN 000680 NORP-12

Stock number 651-507

A cadmium sulphide (CdS) photoconductive cell with a spectral response similar to that of the human eye. The cell resistance falls with increasing light intensity. The device is packaged in a moisture resistant epoxy filled plastic casing. Applications include smoke detection, automatic lighting control, batch counting and burglar alarm systems.

Features

- Wide spectral response
- Low cost
- Wide ambient temperature range.

Absolute maximum ratings

Voltage, ac or dc peak 320V
Current 75mA
Power dissipation at 30°C 250mW
Operating temperature range ..... −60°C to +75°C

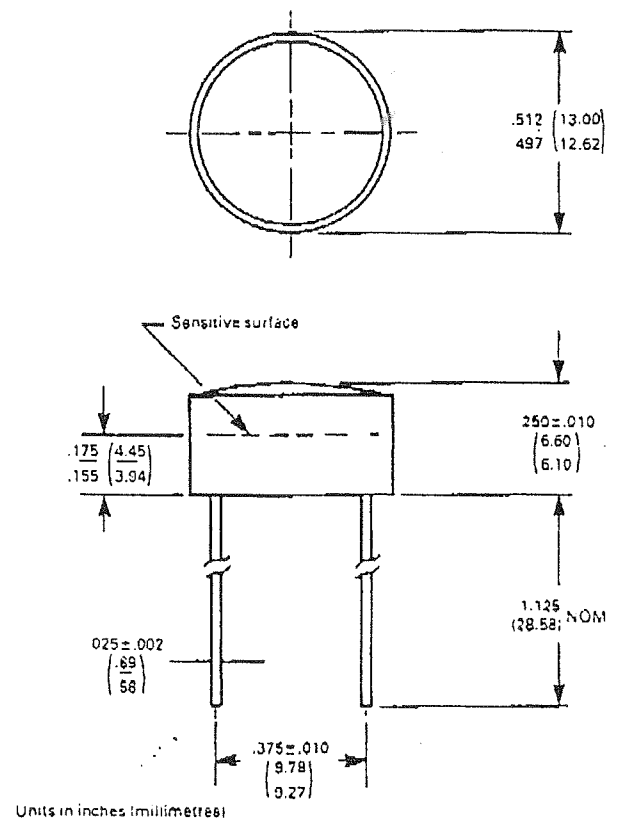
Electrical characteristics

T_A = 25°C. 2854°K tungsten light source

Parameter	Conditions	Min.	Typ.	Max.	Units
Cell resistance	1000 lux	–	400	–	Ω
	10 lux	–	9	–	kΩ
Dark resistance	·	1.0	–	–	MΩ
Dark capacitance	–	–	3.5	–	pF
Rise time 1	1000 lux	–	2.8	–	ms
	10 lux	–	18	–	ms
Fall time 2	1000 lux	–	48	–	ms
	10 lux	–	120	–	ms

1 Dark to 110% R_L
2 To 10 × R_1
R_L = photocell resistance under given illumination.

Dimensions



Units in inches (millimetres)

Guide to source illuminations

Light source	Illumination (Lux)
Moonlight	0.1
60W bulb at 1m	50
1W MES bulb at 0.1m	100
Fluorescent lighting	500
Bright sunlight	30,000

Circuit symbol

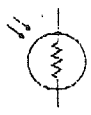


Figure 1 Power dissipation derating

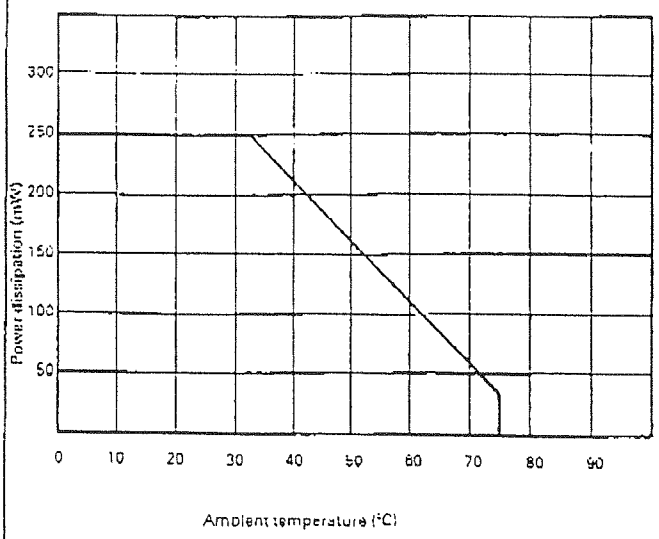
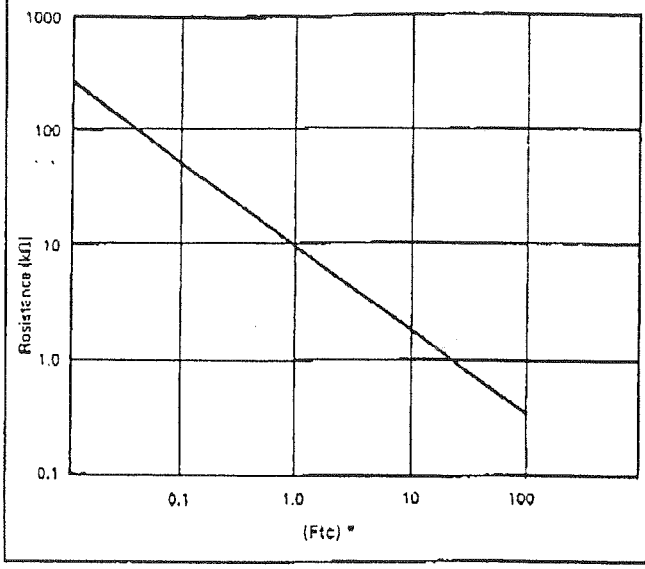
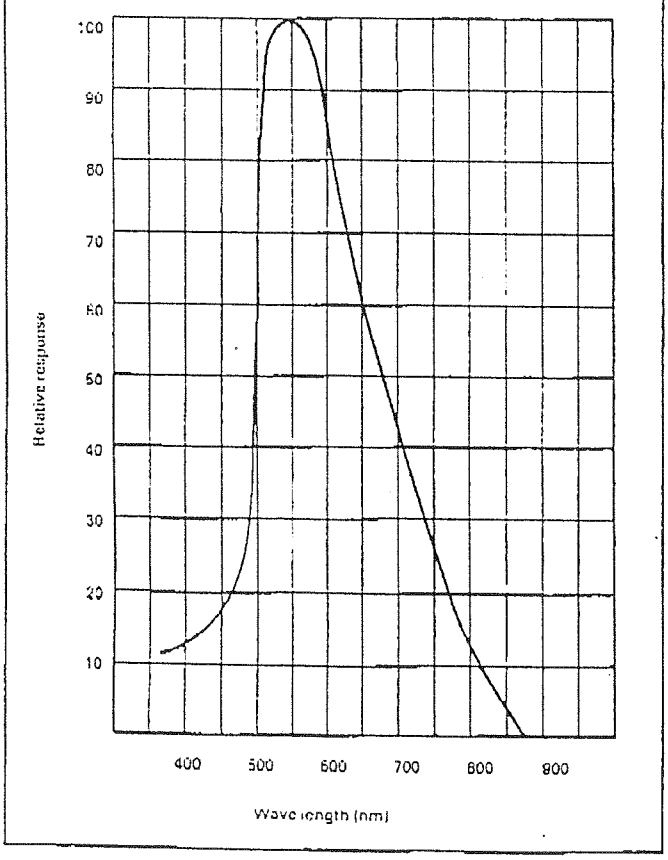


Figure 3 Resistance as a function of illumination



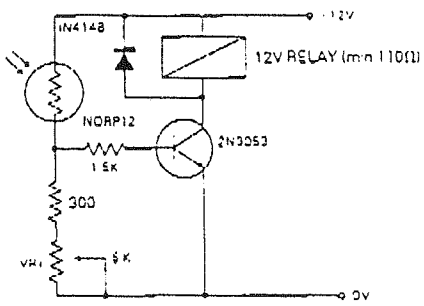
* 1Ftc = 10.764 lumens

Figure 2 Spectral response



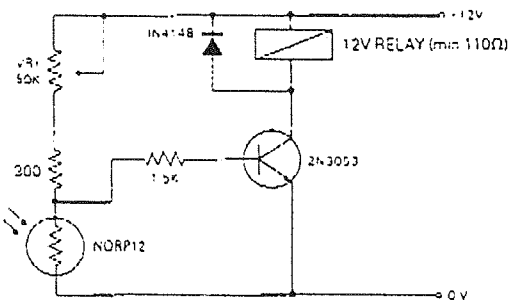
Typical application circuits

Figure 4 Sensitive light operated relay



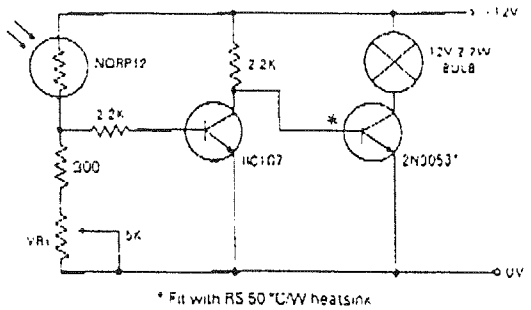
Relay energised when light level increases above the level set by VR_1

Figure 5 Light interruption detector



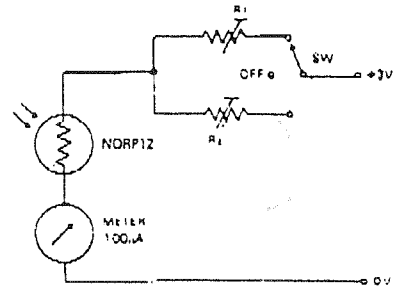
As Figure 4 relay energised when light level drops below the level set by VR_1

Figure 6 Automatic light circuit



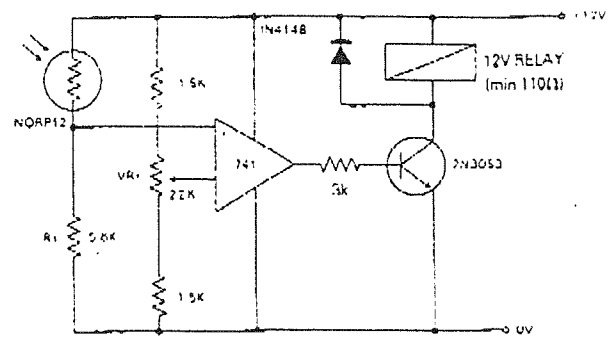
Adjust turn-on point with VR_1

Figure 7 Logarithmic law photographic light meter



Typical value $R_1 = 100k\Omega$
$R_2 = 200k\Omega$ preset to give two overlapping ranges. (Calibration should be made against an accurate meter.)

Figure 8 Extremely sensitive light operated relay



(Relay energised when light exceeds preset level.) Incorporates a balancing bridge and op-amp. R_1 and NORP12 may be interchanged for the reverse function.