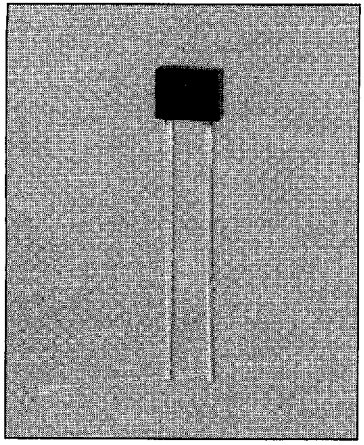
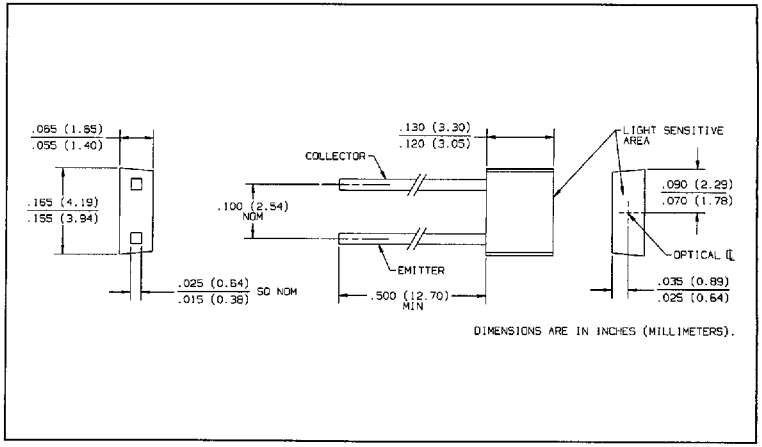
NPN Silicon Photodarlingtons
Types OP538FA, OP538FB, OP538FC





Features

- Flat lensed for wide acceptance angle
- Easily stackable on 0.100 inch (2.54 mm) hole centers
- Low cost plastic package
- Mechanically and spectrally matched to the OP168F and OP268F series of infrared emitting diodes

Description

The OP538F series consists of NPN silicon photodarlingtons mounted in flat lensed, black plastic, "end looking" packages. The flat sensing surface allows an acceptance half angle of 65° measured from the optical axis to the half power point. The black plastic package significantly reduces ambient light noise. These devices can be mounted on 0.100" (2.54 mm) hole centers making them an ideal low cost alternative to hermetic OP600 sensors.

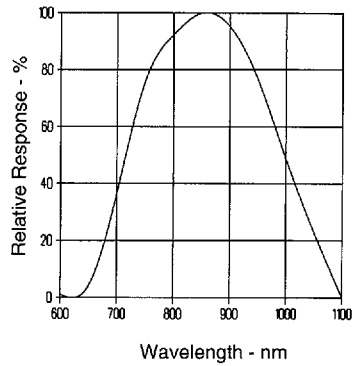
Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	5.0 V
Storage and Operating Temperature Range	-40° C to +100° C
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron]	260° C(1)
Power Dissipation	100 mW(2)

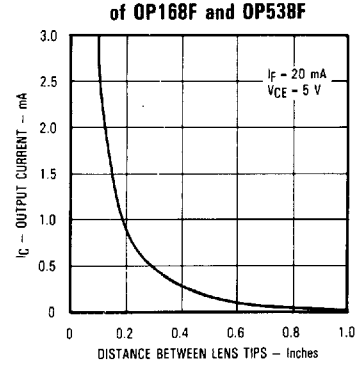
Notes:
(1) RMA flux is recommended. Duration can be extended to 10 seconds max. when flow soldering. Maximum 20 grams force may be applied to the leads when soldering.
(2) Derate linearly 1.33 mW/° C above 25° C.
(3) Light source is an unfiltered GaAs LED with a peak emission wavelength of 935 nm and a radiometric intensity level which varies less than 10% over the entire lens surface of the phototransistor being tested.
(4) Due to high gain of photodarlington, a load resistor should be used to avoid thermal runaways.

Typical Performance Curves

Typical Spectral Response



Coupling Characteristics of OP168F and OP538F



6798580 0002625 888

Types OP538FA, OP538FB, OP538FC

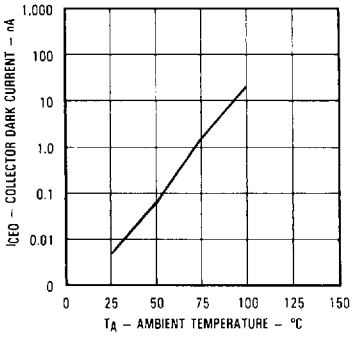
Electrical Characteristics (T_A = 25° C unless otherwise noted)

SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
$I_{C(ON)}$[4]	On-State Collector Current	OP538FC	1.1			mA	V_{CE} = 5.0 V, E_e = 0.5 mW/cm²[3]
		OP538FB	2.3		20.5	mA	V_{CE} = 5.0 V, E_e = 0.5 mW/cm²[3]
		OP538FA	6.8			mA	V_{CE} = 5.0 V, E_e = 0.5 mW/cm²[3]
I_{CEO}	Collector-Dark Current				225	nA	V_{CE} = 10.0 V, E_e = 0
$V_{(BR)CEO}$	Collector-Emittor Breakdown Voltage		15.0			V	I_C = 1.00 mA, E_e = 0
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage		5.0			V	I_E = 100 µA, E_e = 0
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage				1.00	V	I_C = 0.5 mA, E_e = 0.5 mW/cm²[3]

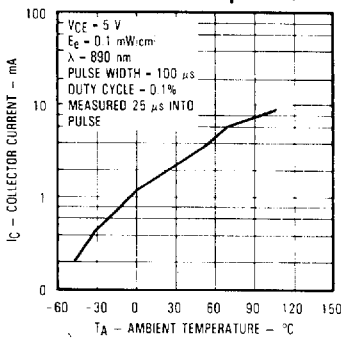
PHOTOSENSORS

Typical Performance Curves

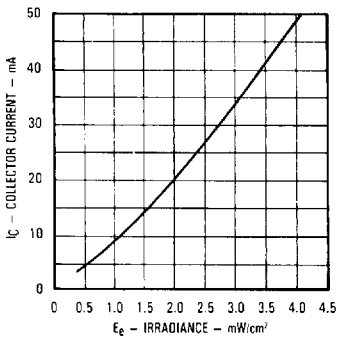
Collector Dark Current vs. Ambient Temperature



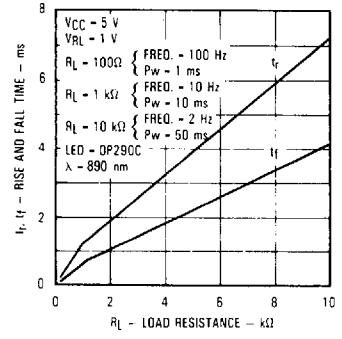
Collector Current vs. Ambient Temperature



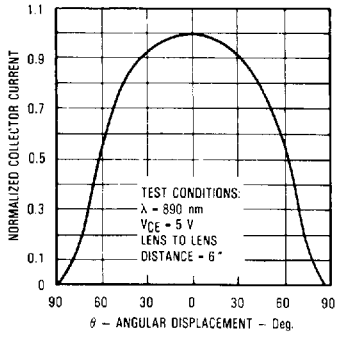
Collector Current vs. Irradiance



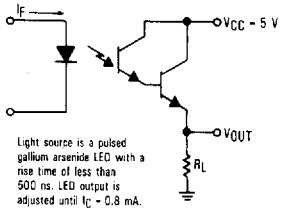
Rise and Fall Time vs. Load Resistance



Normalized Collector Current vs. Angular Displacement



Switching Time Test Circuit



Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

TT Electronics:
OP538FC