.040" NPN Phototransistor Chip — VTT-C40

E G & G VACTEC

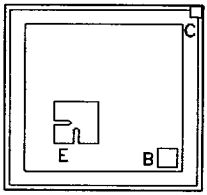
DESCRIPTION

EG&G Vactec fabricates its silicon photosensor chips using state-of-the-art planar diffusion technology. All chips are nitride passivated to ensure long term stability. Collector contact can be made through the backside of the chip. With some devices an additional collector contact is available on the top surface. Base and emitter contacts are available on the top surface of the chip.

A chromium/nickel metallization system, suitable for conductive epoxy die attach, is employed on the backside of the chip. Aluminum metallization is used for the bond pads on the top surface of the die.

Chips can be specially probed for current gain, breakdown voltage, dark current, etc., to satisfy a specific application. Please contact Vactec with your requirements.

CHIP DIMENSIONS inch (mm)



CHIP 40T
.040 (1.02) x .040 (1.02) x .017 (0.43) Thick
.00098 in^2 (0.632 mm^2) Exposed Sensitive Area
Collector Contact is Also Back Side of Chip

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures
Storage Temperature: -65°C to 150°C
Operating Temperature: -65°C to 125°C

Nominal Maximum Continuous
Power Dissipation @ 25°C: 50 mW *

* Exact maximum power dissipation capabilities are determined by customer packaging and are not guaranteed by Vactec.

ELECTRO-OPTICAL CHARACTERISTICS @ 25°C (See also 40T curves, pg. 23)

Symbol	Characteristic	Test Condition	Specification			Units
			Min.	Typ.	Max.	
H_{FE} (Beta)	dc Current Gain	$I_B = 4.0\,\mu A$, $V_{CE} = 5.0$ V	150	550		
I_D	Dark Current	$V_{CE} = 10$ V, $I_B = 0$			100	nA
$V_{BR(CEO)}$	Collector Breakdown Voltage	$I_C = 100\,\mu A$	30			Volts
$V_{BR(ECO)}$	Emitter Breakdown Voltage	$I_E = 100\,\mu A$	6.0			Volts
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	$I_C = 1.0$ mA, $I_B = 50\,\mu A$			0.4	Volts
t_R, t_F	Rise / Fall Time	$I_C = 1.0$ mA, $R_L = 100\,\Omega$		4		μsec
$S_{P(CBO)}$	Collector-Base Photometric Sensitivity	$V_{CB} = 5.0$ V, 2850 K		35		nA / fc
$S_{R(CBO)}$	Collector-Base Radiometric Sensitivity	$V_{CB} = 5.0$ V, 940 nm		2.1		nA /(μW/cm^2)
C_J	Collector-Base Capacitance	$V_{CB} = 5.0$ V, 1 MHz		17		pF

40T Phototransistor Typical Characteristic Curves

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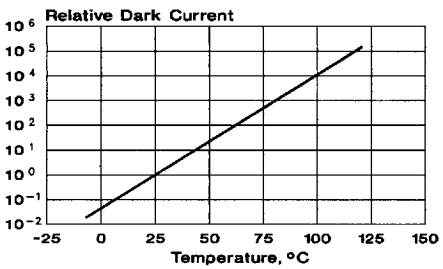
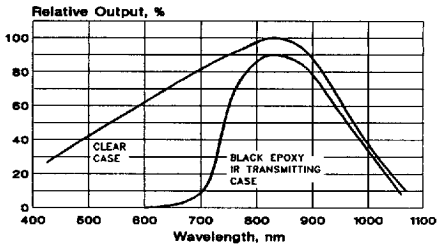
T-41-47

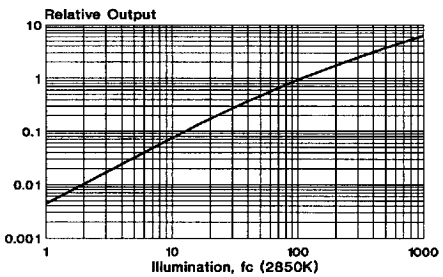
DARK CURRENT vs TEMPERATURE
(REFERRED TO 25°C)



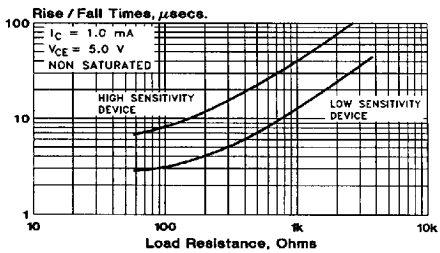
RELATIVE SPECTRAL RESPONSE
(REFERRED TO PEAK RESPONSE OF CLEAR CASE)



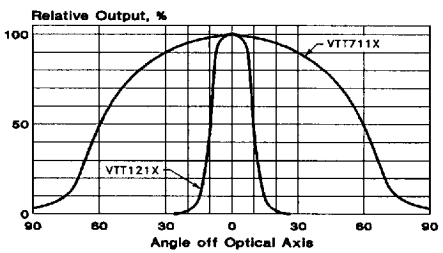
RELATIVE OUTPUT vs ILLUMINATION
(NORMALIZED AT 100 fc)



RESPONSE TIME



ANGULAR RESPONSE
MOLDED EPOXY PACKAGES



ANGULAR RESPONSE
TO-18 PACKAGES