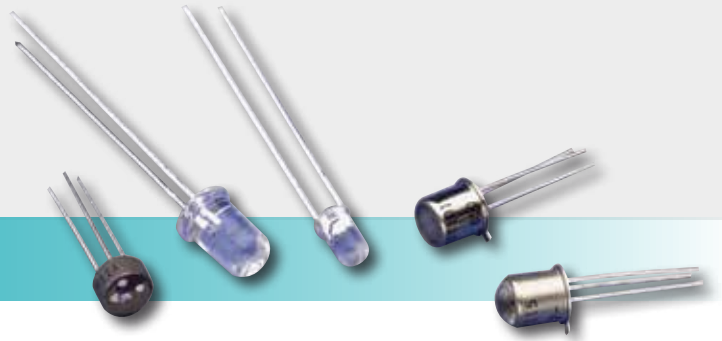


Photo-transistors

For Industrial and Commercial Applications

SILICON PHOTOTRANSISTORS ■

Phototransistors
VTT Series – CR Series



Phototransistors – VTT Series – CR Series

Applications

- Coin counters
- Position sensors
- Remote controllers
- Ambient light sensing
- Street light switching
- Oil burner flame monitoring
- Safety shields
- Margin control-printers
- Monitor paper position and stack height

Features and Benefits

- Low cost visible and near IR photo detection
- Low dark current
- Available in package with integrated visible filtering
- Available in package with integrated IR filtering
- Available in a wide range of packages
- RoHs compliant

Product Description

Phototransistors are photodiode-amplifier combinations integrated within a single silicon chip. The phototransistor can be viewed as a photodiode whose output current is fed into the base of a conventional transistor.

These photodiode-amplifier combinations are put together to overcome the major limitation of photodiodes: unity gain. The typical gain of a phototransistor can range from 100 to over 1500. Many applications demand a greater output than can be generated by a photodiode alone. Even though the signal of a photodiode can be amplified through external circuitry (operational amplifier for example) this is not always cost effective. In such cases, phototransistors provide a lower cost alternative.

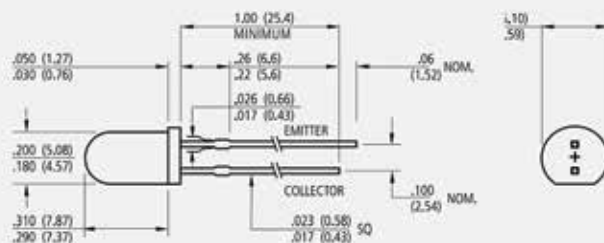
CR50TE



- Surface mounting device
- Solid state ceramic chip
- High thermal conductivity
- Special type (CR50TE-DLF) with daylight filter on request

Figure 1

Package Drawing – VTT Series – T-1¾ Package



Product Table

Phototransistors – VTT Series – CR Series

Symbol	Package	Exposed Active Area mm ²	Light Current @ 100 fc, V _{CE} = 5V		Dark Current @ V _{CE} = 10V		Collector Breakdown @ I _c = 100 μA, 0 fc		Emitter Breakdown @ I _c = 100 μA, 0 fc		Saturation Voltage @ I _c = 100 μA, 100 fc		Rise/Fall Time I _C = 1.0 mA RL = 100 Ω		Angular Response		Spectral Range	
			min	max	min	max	min	max	min	max	min	max	Typical	Typical	Typical	Typical	λ _{RANGE}	
Unit			I _c	I _{CEO}	V _{BR(CEO)}	V _{BR(CEO)}	V _{CE(SAT)}	t _r /t _f	Θ _{1/2}									
			mA	nA	V	V	V	μs	°									
VTT1222WH	T-1¾	0.19	1.9	10 @ VCE = 20V	50	6.0	0.25	2.0	±40								400-1050	
VTT1223WH	T-1¾	0.19	1.5	10 @ VCE = 20V	40	6.0	0.25	3.0	±40								400-1050	
VTT1225H	T-1¾	0.19	4.0	100	30	5.0	0.25	1.5	±5								400-1050	
VTT1226H	T-1¾	0.19	7.5	100	30	5.0	0.25	3.0	±5								400-1050	
VTT1227H	T-1¾	0.19	12.0	100	30	5.0	0.25	4.0	±5								400-1050	
VTT3122EH	Coax hermetic	0.19	1.2	100 @ VCE = 20V	40	6.0	0.25	2.5	±8								400-1050	
VTT3123EH	Coax hermetic	0.19	4.0	100	30	4.0	0.25	4.0	±8								400-1050	
VTT3323LAH	Long T-1	0.19	2.0 @ 20 fc	100	30	5.0	0.25	3.0	±10								400-1050	
VTT3324LAH	Long T-1	0.19	4.0 @ 20 fc	100	30	5.0	0.25	4.0	±10								400-1050	
VTT3325LAH	Long T-1	0.19	6.0 @ 20 fc	100	30	5.0	0.25	5.0	±10								400-1050	
VTT3423LAH	Long T-1	0.19	1.0 @ 20 fc	100	30	5.0	0.25	3.0	±10								700-1050	
VTT3424LAH	Long T-1	0.19	2.0 @ 20 fc	100	30	5.0	0.25	4.0	±10								700-1050	
VTT3425LAH	Long T-1	0.19	3.0 @ 20 fc	100	30	5.0	0.25	5.0	±10								700-1050	
VTT7122H	Lateral	0.19	1.0	100	30	5.0	0.25	2.0	±36								400-1050	
VTT7123H	Lateral	0.19	2.0	100	30	5.0	0.25	2.0	±36								400-1050	
VTT7125H	Lateral	0.19	4.5	100	30	5.0	0.25	2.0	±36								400-1050	
VTT7222H	Lateral	0.19	0.9	100	30	5.0	0.25	2.0	±36								700-1050	
VTT7223H	Lateral	0.19	1.8	100	30	5.0	0.25	2.0	±36								700-1050	
VTT7225H	Lateral	0.19	4.0	100	30	5.0	0.25	4.0	±36								700-1050	
VTT1212H	T-1¾	0.63	2.0 @ 20 fc	100	30	5.0	0.25	4.0	±10								400-1050	
VTT1214H	T-1¾	0.63	4.0 @ 20 fc	100	30	5.0	0.25	6.0	±10								400-1050	
VTT9002H	TO-106 flat	0.63	2.0	100	30	6.0	0.55	4.0	±50								400-1050	
VTT9003H	TO-106 flat	0.63	5.0	100	30	6.0	0.55	6.0	±50								400-1050	
VTT9102H	TO-106 lensed	0.63	6.0	100 @ VCE = 5V	30	4.0	0.55	6.0	±42								400-1050	
VTT9103H	TO-106 lensed	0.63	13.0	100 @ VCE = 5V	30	4.0	0.55	10.0	±42								400-1050	
VTT1015H	TO-46		0.4	25 @ VCE = 20V	40	6.0	0.40	5.0	±35								400-1050	
VTT1016H	TO-46		1.0	25 @ VCE = 20V	30	6.0	0.40	5.0	±35								400-1050	
VTT1017H	TO-46		2.5	25	20	4.0	0.40	8.0	±35								400-1050	
VTT1115H	TO-46 lensed		1.0 @ 20 fc	100	30	6.0	0.40	5.0	±15								400-1050	
VTT1116H	TO-46 lensed		2.0 @ 20 fc	100	30	4.0	0.40	8.0	±15								400-1050	
VTT1117H	TO-46 lensed		4.0 @ 20 fc	100	30	4.0	0.40	8.0	±15								400-1050	
VTT9812FH	T-1¾ flat	0.19	0.10	100	30	5.0	0.25	1.5	±56								450-700	
CR50TE	Ceramic SMD (A2)	0.18		400 @ VCE = 20V	40		0.3 @ I _C = 2 mA	4.0 @ R _L = 50 Ω	Wide viewing angle								400-1070	

Figure 2

Package Drawing – VTT Series – T-1 Package

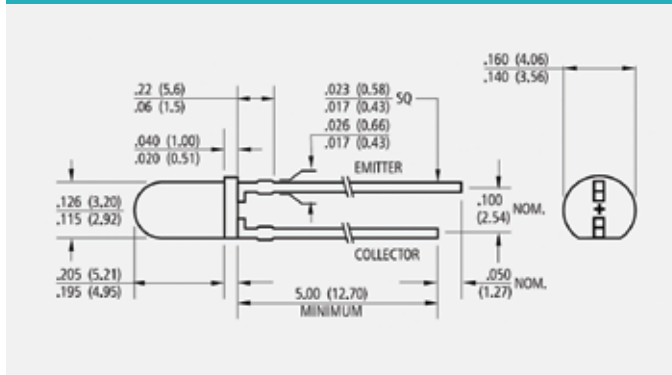
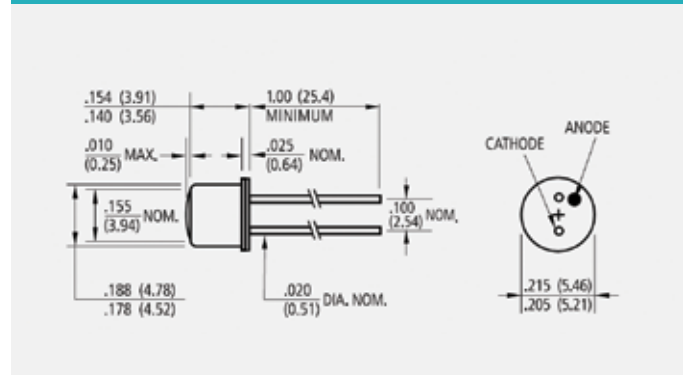


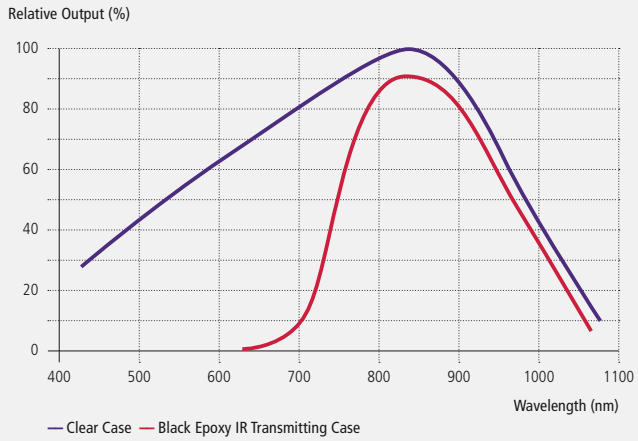
Figure 3

Package Drawing – VTT Series – TO-46 Package



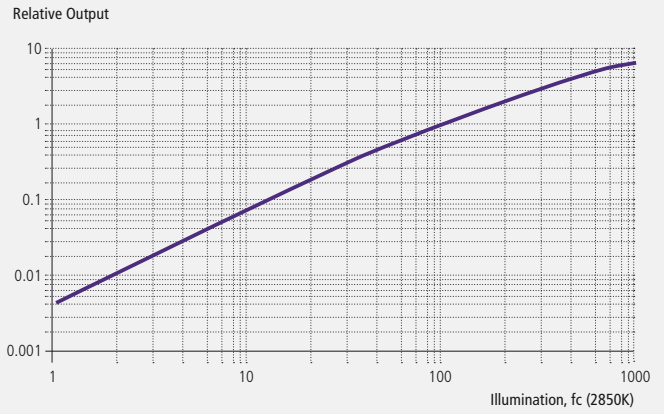
Graph 1

Rel. Spectral Response (Referred to Peak Response of Clear Case)



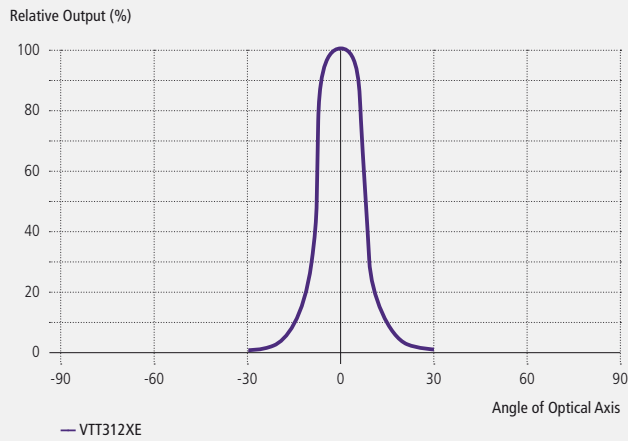
Graph 2

Relative Output vs. Illumination (Normalized at 100 fc)



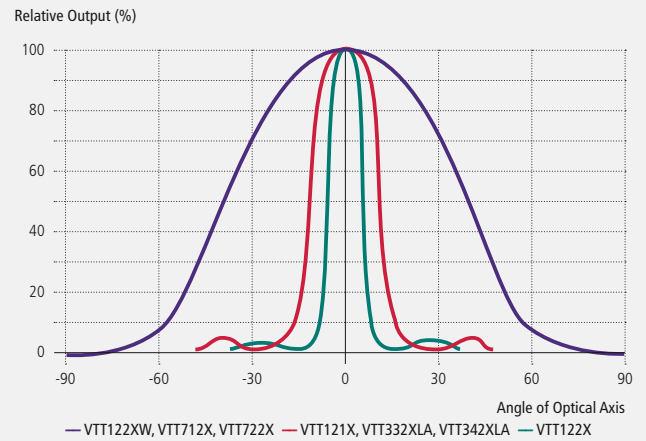
Graph 3

Angular Response Coax Packages



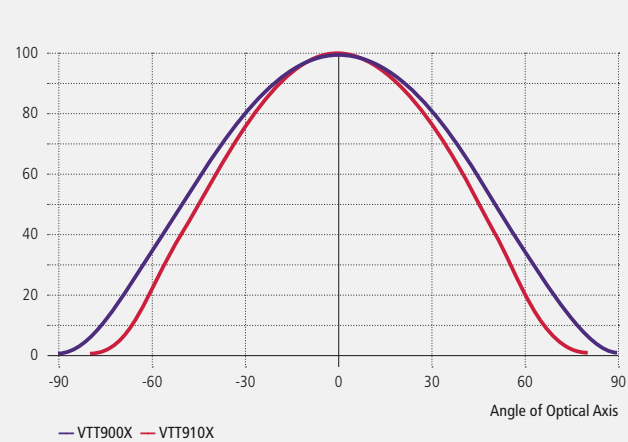
Graph 4

Angular Response Molded Epoxy Packages



Graph 5

Angular Response Ceramic Packages



Graph 6

Angular Response 10-46 Packages

