



The DNA of tech.™



VEMT37..X02: change of the Phototransistor chip

For further information, please contact your regional Vishay office.

CONTACT INFORMATION

Americas

Vishay Intertechnologies, Inc. Business
Marketing The Americas - Opto
25 Tampines Street 92

2585 Junction Avenue San Jose, California
95134-1923

California United States 95134-1923

Phone: +1-408-567-8358

Fax: +1-408-240-5687

-

Europe

VISHAY Semiconductor GmbH Business
Marketing Europe - Opto
Theresienstr. 2

-

Heilbronn Germany D-74025

Phone: +49-7131-7498-645

Fax: +49-7131-67-3144

-

Asia

VISHAY Intertechnology Asia Pte. Ltd.
Business Marketing Asia/Japan
25 Tampines Street 92, Keppel Building #
02-00,

-

Singapore Singapore 528877

Phone: +65 6780 7879

Fax: +65 6780 7897

-

Description of Change: Change of the phototransistor chip from T4530P to T5096P

The Phototransistors are now manufactured on 6 inch wafers instead of the 4 inch wafers

Apart from that, change of the phototransistor results in minor changes in device characteristics, changes in

the datasheet characteristics are listed in the document attached to this

PCN: Changelog

Reason for Change: To qualify new chip T5096P on 6" wafer

Expected Influence on Quality/Reliability/Performance: No influence on quality, reliability and performance expected.

Nevertheless, we recommend to test the product in customers application

Part Numbers/Series/Families Affected: Please see materials list on the succeeding page.

Vishay Brand(S): Vishay Semiconductors

Time Schedule:

Start Shipment Date: Thu Feb 6, 2025

Sample Availability: available upon request

Product Identification: VEMT3705FX02, VEMT3705X02, VEMT3705F, VEMT3705

Qualification Data: available upon request

This PCN is considered approved, without further notification, unless we receive specific customer concerns before Thu Sep 5, 2024 or as specified by contract.

Issued By: Elena Poklonskaya, elena.poklonskaya@vishay.com



Product Change Notification



Product Group: OPT/Tue Aug 6, 2024/PCN-OPT-1324-2024-REV-0

The DNA of tech.™

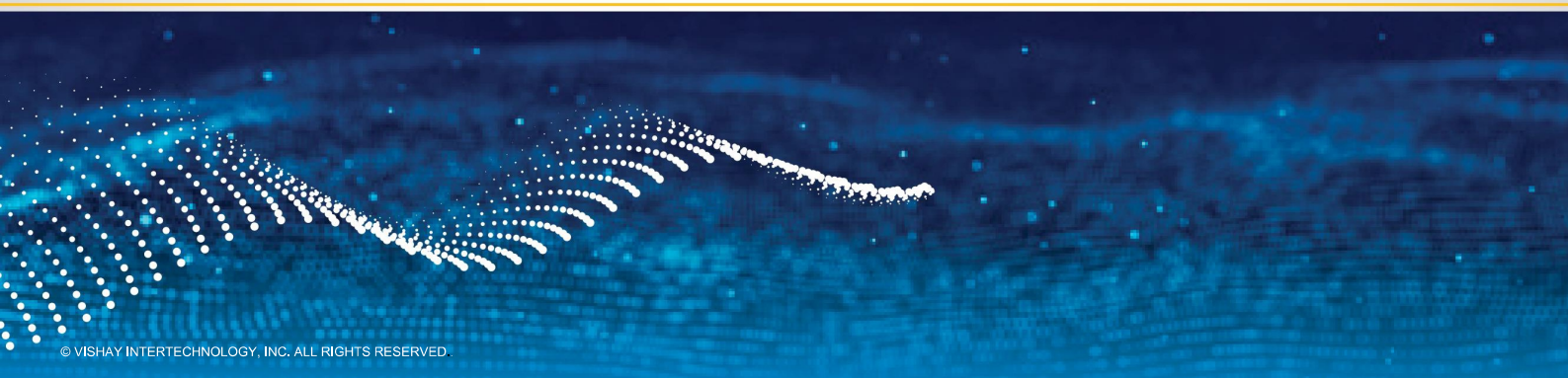
VEMT3700FX01-GS08	VEMT3700FX01-GS18	VEMT3700X01-GS08	VEMT3700X01-GS18	VEMT3700-GS08
VEMT3700-GS18	VEMT3700F-GS08	VEMT3700F-GS18		



The DNA of tech.™

VENT3705X02 – Datasheet

Rev 1.0, 29-Jul-2024 Based on VEMT3700 Rev 1.6, 14-Jul-2010



© VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED.

VENT3705X02 - Datasheet

VENT3700 Rev. 1.6

VENT3705X02 Rev 1.0

FEATURES

- Package type: surface mount
- Package form: PLCC-2
- Dimensions (L x W x H in mm): 3.5 x 2.8 x 1.75
- High photo sensitivity
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity: $\varphi = \pm 60^\circ$
- Package notch indicates collector
- Package matched with IR emitter series VSML3710
- Floor life: 168 h, MSL 3, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC



FEATURES

- Package type: surface-mount
- Package form: PLCC-2
- Dimensions (L x W x H in mm): 3.5 x 2.8 x 1.75
- AEC-Q102 qualified
- Fast response times
- Suitable for visible and near infrared radiation
- Angle of half sensitivity: $\varphi = \pm 60^\circ$
- Package notch indicates collector
- Package matched with IR emitter series VSML3710
- Floor life: 168 h, MSL 3, according to J-STD-020
- Lead (Pb)-free reflow soldering
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



© VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED.



The DNA of tech.™

VENT3705X02 - Datasheet

VENT3700 Rev. 1.6

VENT3705X02 Rev 1.0

PRODUCT SUMMARY			
COMPONENT	I_{DC} (mA)	ϕ (deg)	λ_{25} (nm)
VENT3700	0.5	± 60	450 to 1080

PRODUCT SUMMARY			
COMPONENT	I_{DC} (mA)	ϕ (°)	λ_{25} (nm)
VENT3705X02	0.6	± 60	480 to 1050

© VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED.

VENT3705X02 - Datasheet

VENT3700 Rev. 1.6

VENT3705X02 Rev 1.0

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25$ °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Collector emitter voltage		V_{CEO}	70	V
Emitter collector voltage		V_{ECO}	5	V
Collector current		I_C	50	mA
Collector peak current	$t_p/T \leq 0.1, t_p \leq 10 \mu s$	I_{CM}	100	mA
Power dissipation		P_V	100	mW
Junction temperature		T_J	100	°C
Operating temperature range		T_{amb}	- 40 to + 100	°C
Storage temperature range		T_{stg}	- 40 to + 100	°C
Soldering temperature	Acc. reflow solder profile fig. 10	T_{sd}	260	°C
Thermal resistance junction/ambient	Soldered on PCB with pad dimensions: 4 mm x 4 mm	$R_{\theta JA}$	400	K/W

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25$ °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Collector emitter voltage		V_{CEO}	20	V
Emitter collector voltage		V_{ECO}	7.8	V
Collector current		I_C	50	mA
Collector peak current	$t_p/T \leq 0.1, t_p \leq 10 \mu s$	I_{CM}	100	mA
Power dissipation		P_V	100	mW
Junction temperature		T_J	100	°C
Temperature range		T_{amb}	-40 to +100	°C
Storage temperature range		T_{stg}	-40 to +100	°C
Soldering temperature	According to reflow solder profile Fig. 10	T_{sd}	260	°C
Thermal resistance junction to ambient	Soldered on PCB with pad dimensions: 4 mm x 4 mm	$R_{\theta JA}$	400	K/W

© VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED.

VENT3705X02 - Datasheet

VENT3700 Rev. 1.6

VENT3705X02 Rev 1.0

BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector emitter breakdown voltage	I _C = 1 mA	V _{BRCEO}	70			V
Collector emitter dark current	V _{CE} = 20 V, E = 0	I _{CCEO}		1	200	nA
Collector emitter capacitance	V _{CE} = 5 V, f = 1 MHz, E = 0	C _{CEO}		3		pF
Collector light current	E _s = 1 mW/cm ² , λ = 950 nm, V _{CE} = 5 V	I _{ca}	0.25	0.5		mA
Angle of half sensitivity		φ		± 60		deg
Wavelength of peak sensitivity		λ _p		850		nm
Range of spectral bandwidth		λ _{0.1}		450 to 1080		nm
Collector emitter saturation voltage	E _s = 1 mW/cm ² , λ = 950 nm, I _C = 0.1 mA	V _{CEsat}		0.15	0.3	V
Rise time, fall time	V _S = 5 V, I _C = 1 mA, λ = 950 nm, R _L = 1 kΩ	t _r /t _f		6		μs
	V _S = 5 V, I _C = 1 mA, λ = 950 nm, R _L = 100 Ω	t _r /t _f		2		μs
Cut-off frequency	V _S = 5 V, I _C = 2 mA, R _L = 100 Ω	f _c		180		kHz

BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector emitter breakdown voltage	I _C = 1 mA	V _{BRCEO}	20	-	-	V
Collector emitter dark current	V _{CE} = 20 V, E = 0	I _{CCEO}	-	0.2	200	nA
Collector emitter capacitance	V _{CE} = 5 V, f = 1 MHz, E = 0	C _{CEO}	-	5	-	pF
Collector light current	E _s = 1 mW/cm ² , λ = 940 nm, V _{CE} = 5 V	I _{ca}	0.25	0.6	-	mA
Angle of half sensitivity		φ	-	± 60	-	°
Wavelength of peak sensitivity		λ _p	-	950	-	nm
Range of spectral bandwidth		λ _{0.1}	-	480 to 1050	-	nm
Collector emitter saturation voltage	E _s = 1 mW/cm ² , λ = 940 nm, I _C = 0.1 mA	V _{CEsat}	-	0.11	0.3	V
Rise time	V _{CE} = 5 V, I _C = 0.7 mA, λ = 940 nm, R _L = 100 Ω	t _r	-	14	-	μs
Fall time	V _{CE} = 5 V, I _C = 0.7 mA, λ = 940 nm, R _L = 100 Ω	t _f	-	21	-	μs

© VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED.

VENT3705X02 - Datasheet

VENT3700 Rev. 1.6

VENT3705X02 Rev 1.0

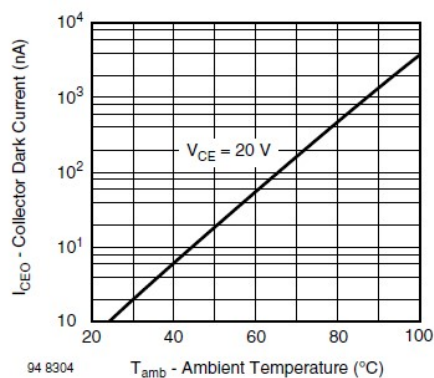


Fig. 2 - Collector Dark Current vs. Ambient Temperature

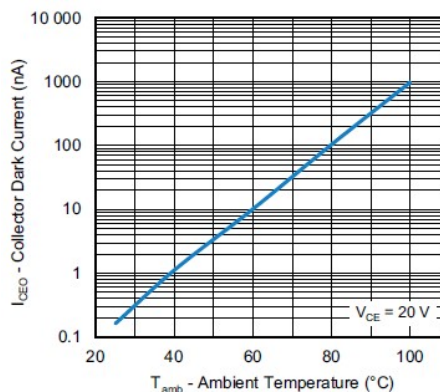


Fig. 2 - Collector Dark Current vs. Ambient Temperature

© VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED.

VENTM3705X02 - Datasheet

VENTM3700 Rev. 1.6

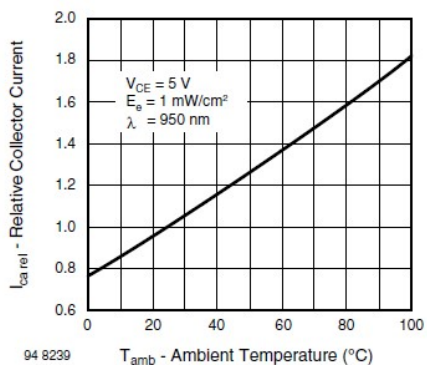


Fig. 3 - Relative Collector Current vs. Ambient Temperature

VENTM3705X02 Rev 1.0

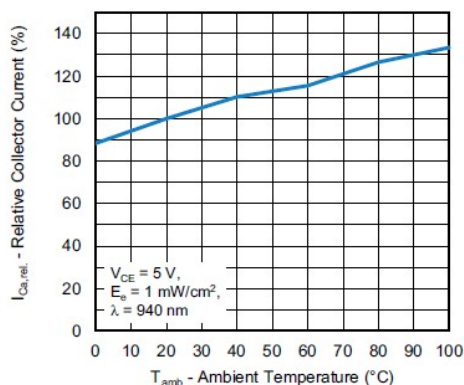


Fig. 3 - Relative Collector Current vs. Ambient Temperature

VENTM3705X02 - Datasheet

VENTM3700 Rev. 1.6

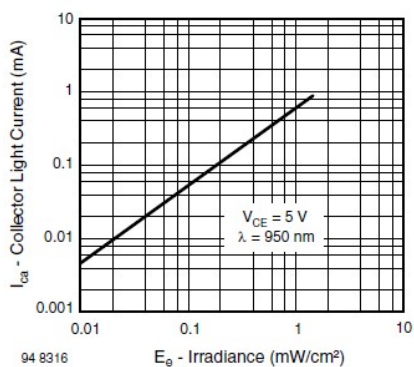


Fig. 4 - Collector Light Current vs. Irradiance

VENTM3705X02 Rev 1.0

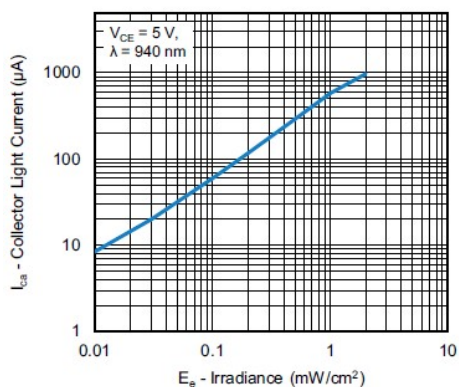


Fig. 4 - Collector Light Current vs. Irradiance

VENT3705X02 - Datasheet

VENT3700 Rev. 1.6

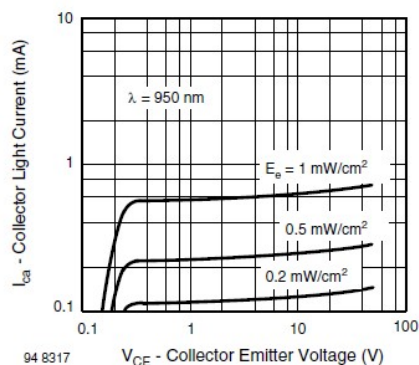


Fig. 5 - Collector Light Current vs. Collector Emitter Voltage

VENT3705X02 Rev 1.0

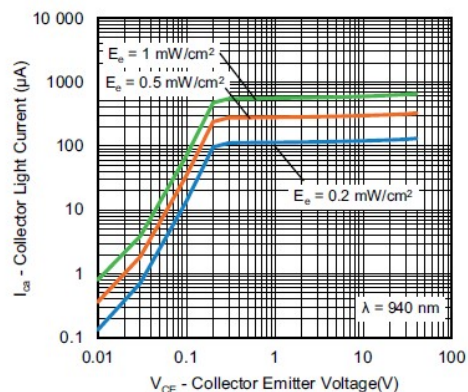


Fig. 5 - Collector Light Current vs. Collector Emitter Voltage

VENT3705X02 - Datasheet

VENT3700 Rev. 1.6

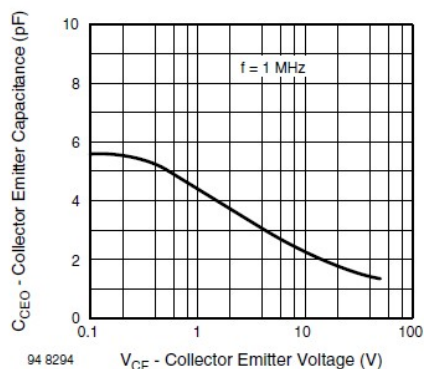


Fig. 6 - Collector Emitter Capacitance vs. Collector Emitter Voltage

VENT3705X02 Rev 1.0

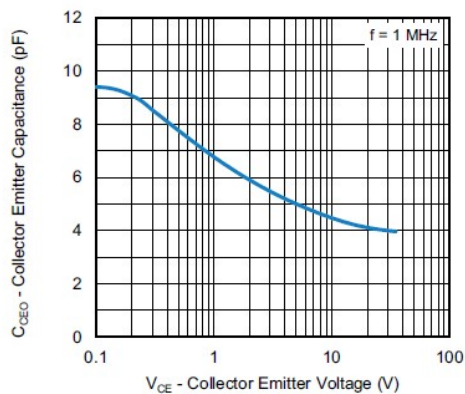


Fig. 6 - Collector Emitter Capacitance vs. Collector Emitter Voltage

VENT3705X02 - Datasheet

VENT3700 Rev. 1.6

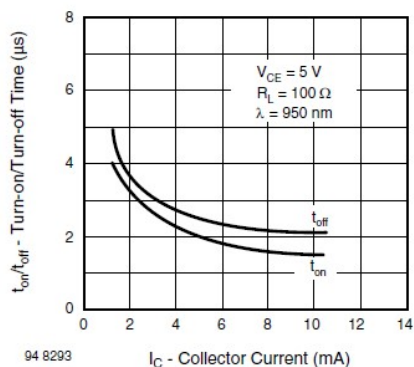


Fig. 7 - Turn-on/Turn-off Time vs. Collector Current

© VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED.

VENT3705X02 Rev 1.0

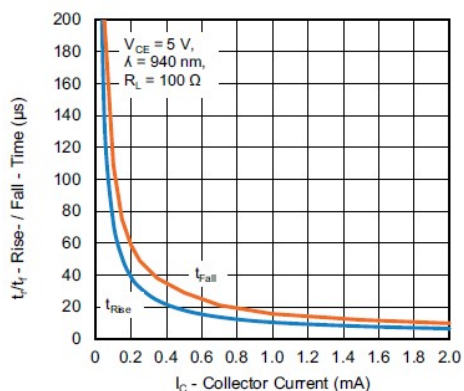


Fig. 7 - Turn-on / Turn-off Time vs. Collector Current

VENT3705X02 - Datasheet

VENT3700 Rev. 1.6

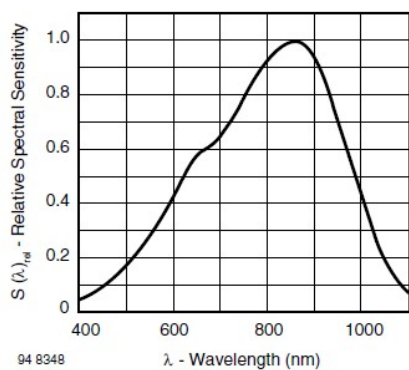


Fig. 8 - Relative Spectral Sensitivity vs. Wavelength

© VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED.

VENT3705X02 Rev 1.0

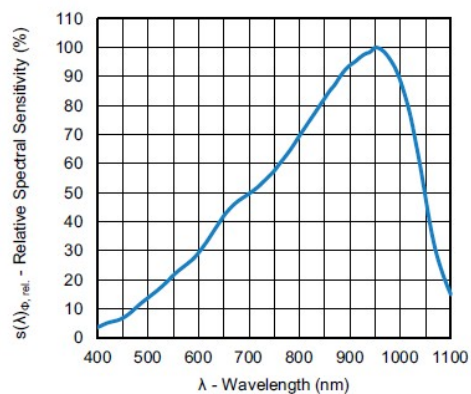


Fig. 8 - Relative Spectral Sensitivity vs. Wavelength

VEMT3705X02 - Datasheet

VEMT3700 Rev. 1.6

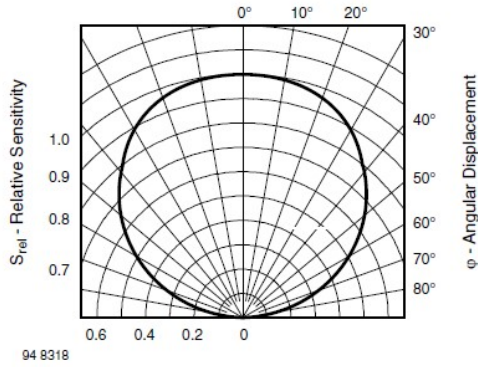


Fig. 9 - Relative Radiant Sensitivity vs. Angular Displacement

VEMT3705X02 Rev 1.0

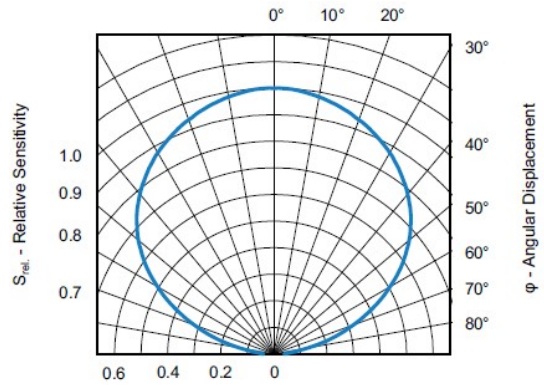


Fig. 9 - Relative Sensitivity vs. Angular Displacement

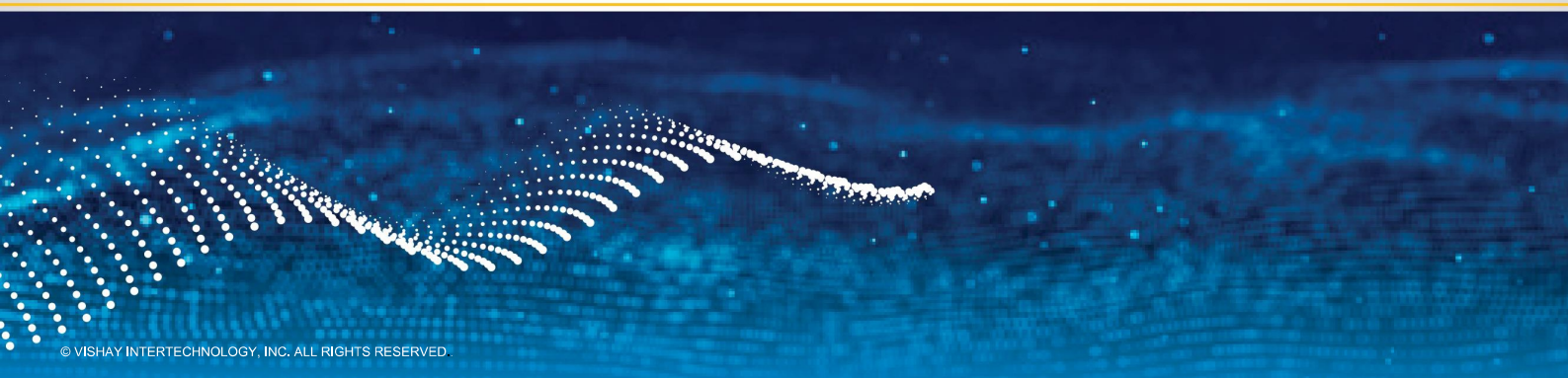
THANK YOU



The DNA of tech.™

VENT3705FX02 – Datasheet

Rev 1.0, 06-Aug-2024 Based on VEMT3700F Rev 1.6, 14-Jul-2010



© VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED.

VENT3705X02 - Datasheet

VENT3700F Rev. 1.6

VENT3705FX02 Rev 1.0

FEATURES

- Package type: surface mount
- Package form: PLCC-2
- Dimensions (L x W x H in mm): 3.5 x 2.8 x 1.75
- High radiant sensitivity
- Fast response times
- Daylight blocking filter matched with 870 nm to 950 nm emitters
- Angle of half sensitivity: $\varphi = \pm 60^\circ$
- Package notch indicates collector
- Package matched with IR emitter series VSML3710
- Floor life: 168 h, MSL 3, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC



RoHS
COMPLIANT
GREEN
(5-2008)**

FEATURES

- Package type: surface-mount
- Package form: PLCC-2
- Dimensions (L x W x H in mm): 3.5 x 2.8 x 1.75
- **AEC-Q102 qualified**
- Fast response times
- Daylight blocking filter matched with 870 nm to 950 nm emitters
- Angle of half sensitivity: $\varphi = \pm 60^\circ$
- Package notch indicates collector
- Package matched with IR emitter series VSML3710
- Floor life: 168 h, MSL 3, according to J-STD-020
- Lead (Pb)-free reflow soldering
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

© VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED.



The DNA of tech.™

VENT3705X02 - Datasheet

VENT3700F Rev. 1.6

VENT3705FX02 Rev 1.0

PRODUCT SUMMARY			
COMPONENT	I _{ca} (mA)	φ (deg)	λ _{0.5} (nm)
VENT3700F	0.5	± 60	870 to 1050

PRODUCT SUMMARY			
COMPONENT	I _{ca} (mA)	φ (°)	λ _{0.5} (nm)
VENT3705FX02	0.5	± 60	880 to 1050

Note
 • Test conditions see table "Basic Characteristics"

VENT3705X02 - Datasheet

VENT3700F Rev. 1.6

VENT3705FX02 Rev 1.0

ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Collector emitter voltage		V _{CEO}	70	V
Emitter collector voltage		V _{ECO}	5	V
Collector current		I _C	50	mA
Collector peak current	t _p /T ≤ 0.1, t _p ≤ 10 μs	I _{CM}	100	mA
Power dissipation		P _V	100	mW
Junction temperature		T _J	100	°C
Operating temperature range		T _{amb}	-40 to +100	°C
Storage temperature range		T _{stg}	-40 to +100	°C
Soldering temperature	Acc. reflow solder profile fig. 10	T _{sd}	260	°C
Thermal resistance junction/ambient	Soldered on PCB with pad dimensions: 4 mm x 4 mm	R _{thJA}	400	K/W

ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Collector emitter voltage		V _{CEO}	20	V
Emitter collector voltage		V _{ECO}	7.8	V
Collector current		I _C	50	mA
Collector peak current	t _p /T ≤ 0.1, t _p ≤ 10 μs	I _{CM}	100	mA
Power dissipation		P _V	100	mW
Junction temperature		T _J	100	°C
Temperature range		T _{amb}	-40 to +100	°C
Storage temperature range		T _{stg}	-40 to +100	°C
Soldering temperature	According to reflow solder profile Fig. 10	T _{sd}	260	°C
Thermal resistance junction to ambient	Soldered on PCB with pad dimensions: 4 mm x 4 mm	R _{thJA}	400	K/W

VENTM3705X02 - Datasheet

VENTM3700F Rev. 1.6

VENTM3705FX02 Rev 1.0

BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector emitter breakdown voltage	I _C = 1 mA	V _{BRCE0}	70			V
Collector emitter dark current	V _{CE} = 20 V, E = 0	I _{CED0}		1	200	nA
Collector emitter capacitance	V _{CE} = 5 V, f = 1 MHz, E = 0	C _{CE0}		3		pF
Collector light current	E _s = 1 mW/cm ² , λ = 950 nm, V _{CE} = 5 V	I _{ca}	0.25	0.5		mA
Angle of half sensitivity		φ		± 60		deg
Wavelength of peak sensitivity		λ _p		940		nm
Range of spectral bandwidth		λ _{0.5}		870 to 1050		nm
Collector emitter saturation voltage	E _s = 1 mW/cm ² , λ = 950 nm, I _C = 0.1 mA	V _{CEsat}		0.15	0.3	V
Rise time, fall time	V _S = 5 V, I _C = 1 mA, λ = 950 nm, R _L = 1 kΩ	t _r /t _f		6		μs
	V _S = 5 V, I _C = 1 mA, λ = 950 nm, R _L = 100 Ω	t _r /t _f		2		μs
Cut-off frequency	V _S = 5 V, I _C = 2 mA, R _L = 100 Ω	f _c		180		kHz

BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Collector emitter breakdown voltage	I _C = 1 mA	V _{BRCE0}	20	-	-	V
Collector emitter dark current	V _{CE} = 20 V, E = 0	I _{CED0}	-	0.2	200	nA
Collector emitter capacitance	V _{CE} = 5 V, f = 1 MHz, E = 0	C _{CE0}	-	5	-	pF
Collector light current	E _s = 1 mW/cm ² , λ = 940 nm, V _{CE} = 5 V	I _{ca}	0.25	0.6	-	mA
Angle of half sensitivity		φ	-	± 60	-	°
Wavelength of peak sensitivity		λ _p	-	950	-	nm
Range of spectral bandwidth		λ _{0.1}	-	480 to 1050	-	nm
Collector emitter saturation voltage	E _s = 1 mW/cm ² , λ = 940 nm, I _C = 0.1 mA	V _{CEsat}	-	0.11	0.3	V
Rise time	V _{CE} = 5 V, I _C = 0.7 mA, λ = 940 nm, R _L = 100 Ω	t _r	-	14	-	μs
Fall time	V _{CE} = 5 V, I _C = 0.7 mA, λ = 940 nm, R _L = 100 Ω	t _f	-	21	-	μs

VENTM3705X02 - Datasheet

VENTM3700F Rev. 1.6

VENTM3705FX02 Rev 1.0

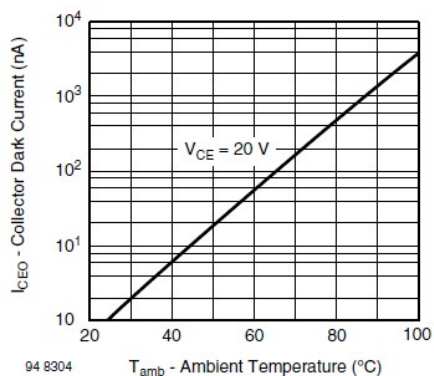


Fig. 2 - Collector Dark Current vs. Ambient Temperature

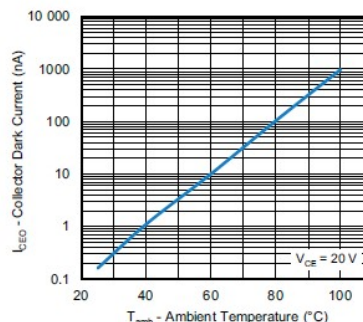


Fig. 2 - Collector Dark Current vs. Ambient Temperature

VENT3705X02 - Datasheet

VENT3700F Rev. 1.6

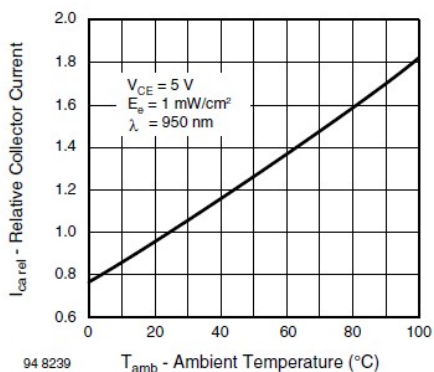


Fig. 3 - Relative Collector Current vs. Ambient Temperature

VENT3705FX02 Rev 1.0

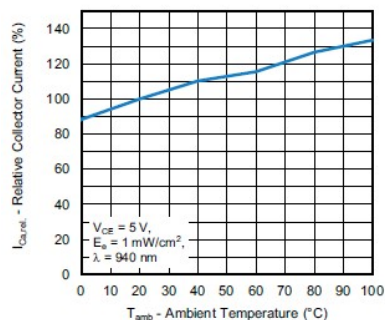


Fig. 3 - Relative Collector Current vs. Ambient Temperature

VENT3705X02 - Datasheet

VENT3700F Rev. 1.6

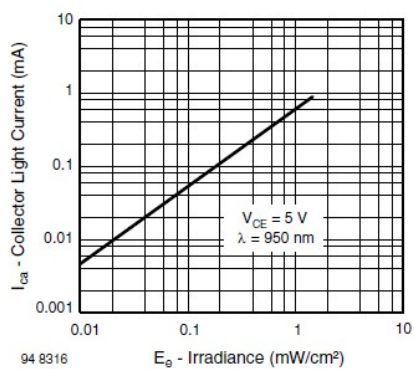


Fig. 4 - Collector Light Current vs. Irradiance

VENT3705FX02 Rev 1.0

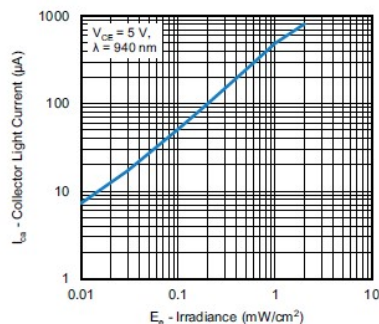


Fig. 4 - Collector Light Current vs. Irradiance

VENT3705X02 - Datasheet

VENT3700F Rev. 1.6

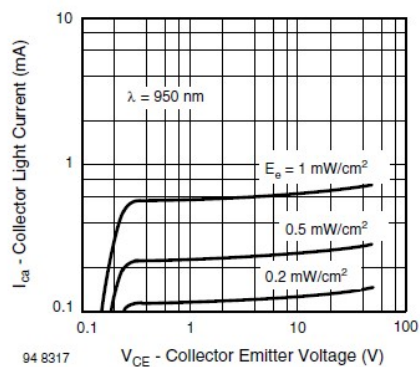


Fig. 5 - Collector Light Current vs. Collector Emitter Voltage

© VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED.

VENT3705FX02 Rev 1.0

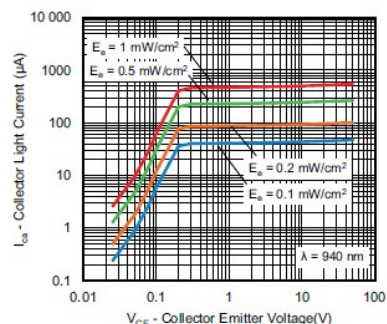


Fig. 5 - Collector Light Current vs. Collector Emitter Voltage

VENT3705X02 - Datasheet

VENT3700F Rev. 1.6

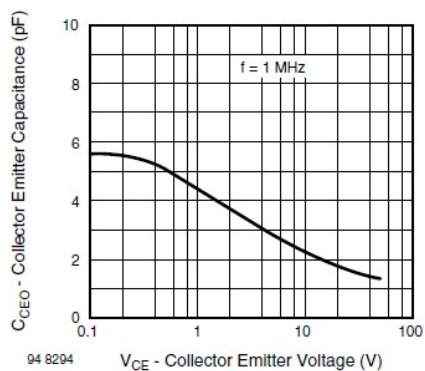


Fig. 6 - Collector Emitter Capacitance vs. Collector Emitter Voltage

© VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED.

VENT3705FX02 Rev 1.0

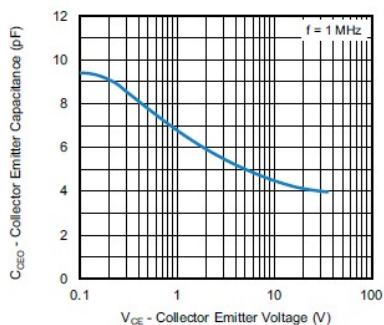


Fig. 6 - Collector Emitter Capacitance vs. Collector Emitter Voltage

VEMT3705X02 - Datasheet

VEMT3700F Rev. 1.6

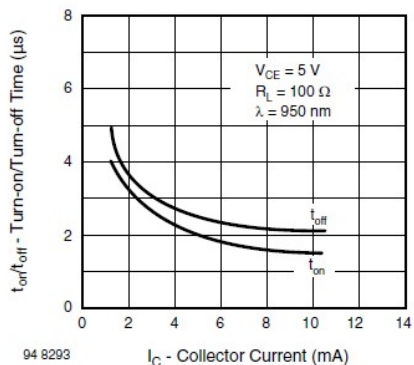


Fig. 7 - Turn-on/Turn-off Time vs. Collector Current

© VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED.

VEMT3705FX02 Rev 1.0

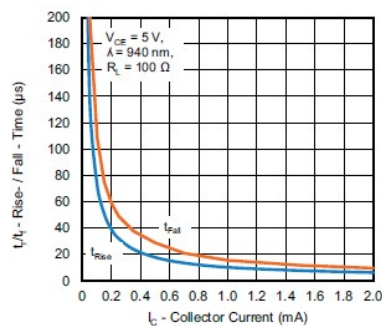


Fig. 7 - Turn-on / Turn-off Time vs. Collector Current

VEMT3705X02 - Datasheet

VEMT3700F Rev. 1.6

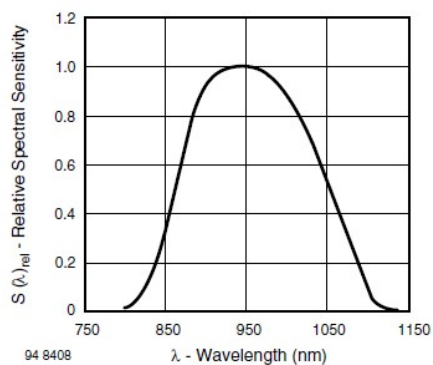


Fig. 8 - Relative Spectral Sensitivity vs. Wavelength

© VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED.

VEMT3705FX02 Rev 1.0

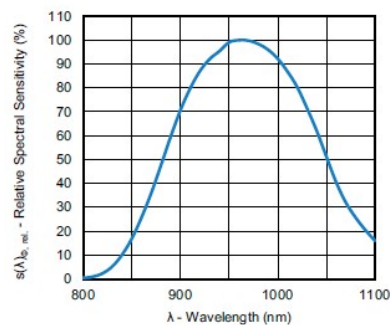


Fig. 8 - Relative Spectral Sensitivity vs. Wavelength

VEMT3705X02 - Datasheet

VEMT3700F Rev. 1.6

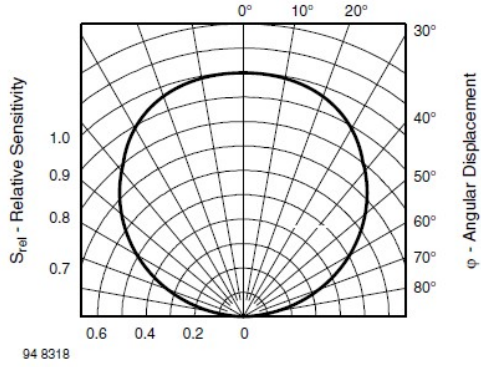


Fig. 9 - Relative Radiant Sensitivity vs. Angular Displacement

VEMT3705FX02 Rev 1.0

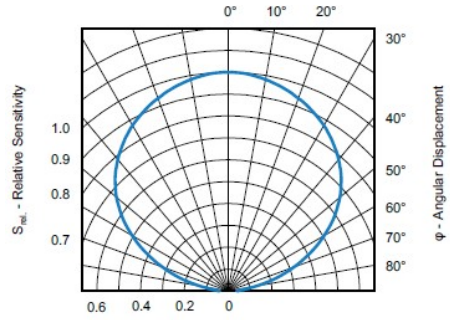


Fig. 9 - Relative Sensitivity vs. Angular Displacement

THANK YOU