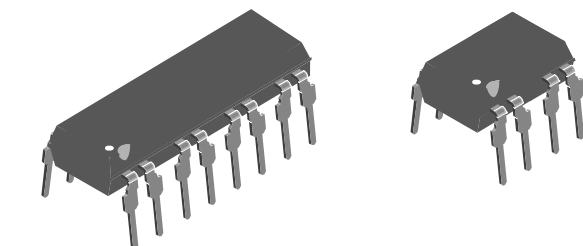
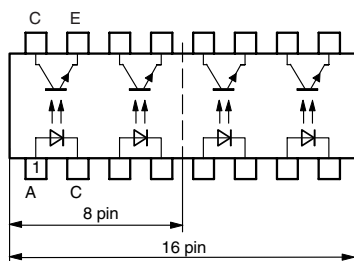


Optocoupler, Phototransistor Output



17203-6



17203-7



FEATURES

- DC isolation test voltage 5000 V_{RMS}
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC

APPLICATIONS

- Programmable logic controllers
- Modems
- Answering machines
- General applications

AGENCY APPROVALS

- UL1577, file no. E57244 system code H, double protection
- cUL tested to CSA 22.2 bulletin 5A, UL1577, file no. E52744



RoHS
COMPLIANT

DESCRIPTION

In the K827PH, K847PH parts each channel consist of a phototransistor optically coupled to a gallium arsenide infrared-emitting diode in a 8 pin (dual); 16 pin (quad) plastic dual inline package.

ORDER INFORMATION

PART	REMARKS
K827PH	CTR 50 % to 600 %, DIP-8
K847PH	CTR 50 % to 600 %, DIP-16

Note

K827PH and K847PH are marked as K827P and K847P respectively.

ABSOLUTE MAXIMUM RATINGS ⁽¹⁾ ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
INPUT				
Reverse voltage		V_R	6	V
Forward current		I_F	60	mA
Forward surge current	$t_p \leq 10\text{ }\mu\text{s}$	I_{FSM}	1.5	A
Power dissipation		P_{diss}	100	mW
Junction temperature		T_j	125	$^{\circ}\text{C}$
OUTPUT				
Collector emitter voltage		V_{CEO}	70	V
Emitter collector voltage		V_{ECO}	7	V
Collector current		I_C	50	mA
Collector peak current	$t_p/T = 0.5, t_p \leq 10\text{ ms}$	I_{CM}	100	mA
Power dissipation		P_{diss}	150	mW
Junction temperature		T_j	125	$^{\circ}\text{C}$

ABSOLUTE MAXIMUM RATINGS ⁽¹⁾ ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
COUPLER				
AC isolation test voltage (RMS)	$t = 1\text{ min}$	V_{ISO}	5000	V_{RMS}
Total power dissipation		P_{tot}	250	mW
Operating ambient temperature range		T_{amb}	- 40 to + 100	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	- 55 to + 125	$^{\circ}\text{C}$
Soldering temperature ⁽²⁾	2 mm from case, $t \leq 10\text{ s}$	T_{sld}	260	$^{\circ}\text{C}$

Notes

⁽¹⁾ Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to absolute maximum ratings for extended periods of the time can adversely affect reliability.

⁽²⁾ Refer to wave profile for soldering conditions for through hole devices.

ELECTRICAL CHARACTERISTICS ⁽¹⁾ ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT						
Forward voltage	$I_F = 50\text{ mA}$	V_F		1.25	1.6	V
Junction capacitance	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$	C_j		50		pF
OUTPUT						
Collector emitter voltage	$I_C = 100\text{ }\mu\text{A}$	V_{CEO}	70			V
Emitter collector voltage	$I_E = 100\text{ }\mu\text{A}$	V_{ECO}	7			V
Collector dark current	$V_{CE} = 20\text{ V}$, $I_F = 0$, $E = 0$	I_{CEO}			100	nA
COUPLER						
Collector emitter saturation voltage	$I_F = 10\text{ mA}$, $I_C = 1\text{ mA}$	V_{CEsat}			0.3	V
Cut-off frequency	$I_F = 10\text{ mA}$, $V_{CE} = 5\text{ V}$, $R_L = 100\text{ }\Omega$	f_c		100		kHz
Coupling capacitance	$f = 1\text{ MHz}$	C_k		0.3		pF

Note

⁽¹⁾ Minimum and maximum values are testing requirements. Typical values are characteristics of the device and are the result of engineering evaluation. Typical values are for information only and are not part of the testing requirements.

CURRENT TRANSFER RATIO							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
I_C/I_F	$V_{CE} = 5\text{ V}$, $I_F = 5\text{ mA}$	K827PH	CTR	50		600	%
		K847PH	CTR	50		600	%

SWITCHING CHARACTERISTICS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Delay time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\ \Omega$ (see figure 1)	t_d		3		μs
Rise time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\ \Omega$ (see figure 1)	t_r		3		μs
Fall time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\ \Omega$ (see figure 1)	t_f		4.7		μs
Storage time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\ \Omega$ (see figure 1)	t_s		0.3		μs
Turn-on time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\ \Omega$ (see figure 1)	t_{on}		6		μs
Turn-off time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\ \Omega$ (see figure 1)	t_{off}		5		μs
Turn-on time	$V_S = 5\text{ V}$, $I_F = 10\text{ mA}$, $R_L = 1\text{ k}\Omega$ (see figure 2)	t_{on}		9		μs
Turn-off time	$V_S = 5\text{ V}$, $I_F = 10\text{ mA}$, $R_L = 1\text{ k}\Omega$ (see figure 2)	t_{off}		18		μs

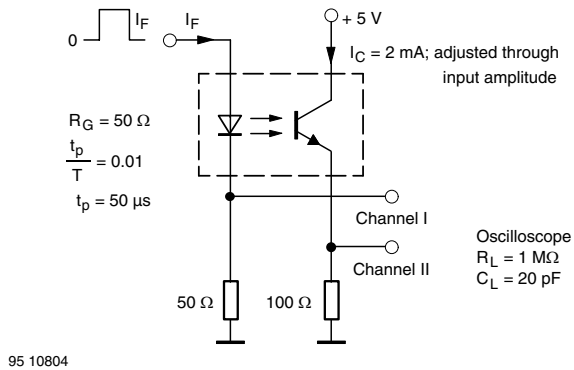


Fig. 1 - Test Circuit, Non-Saturated Operation

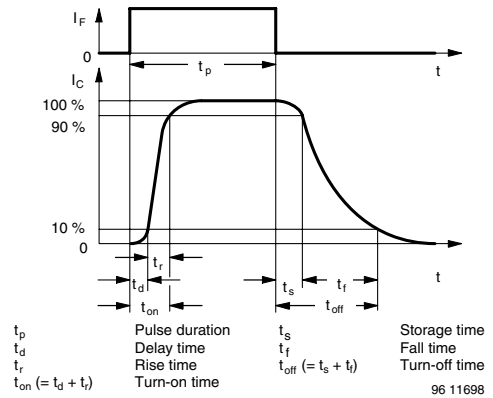


Fig. 3 - Switching Times

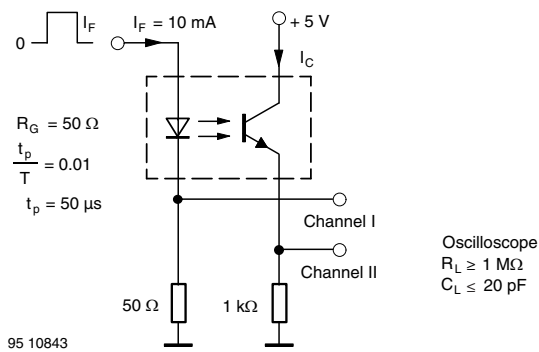


Fig. 2 - Test Circuit, Saturated Operation

TYPICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$, unless otherwise specified)

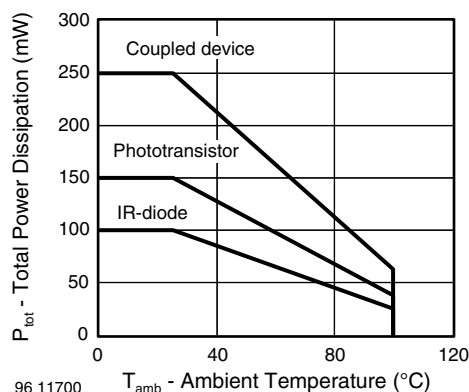


Fig. 4 - Total Power Dissipation vs. Ambient Temperature

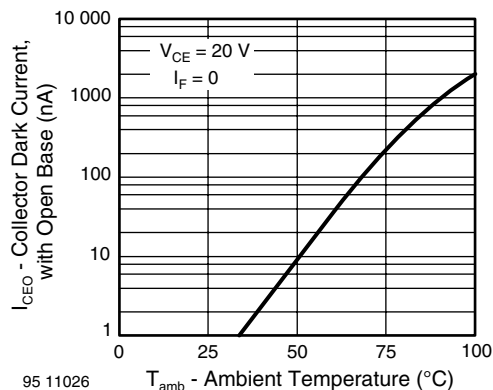


Fig. 7 - Collector Dark Current vs. Ambient Temperature

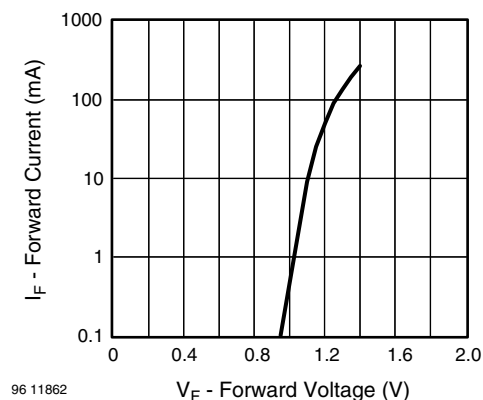


Fig. 5 - Forward Current vs. Forward Voltage

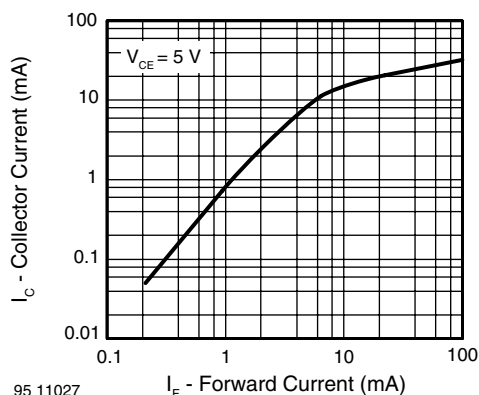


Fig. 8 - Collector Current vs. Forward Current

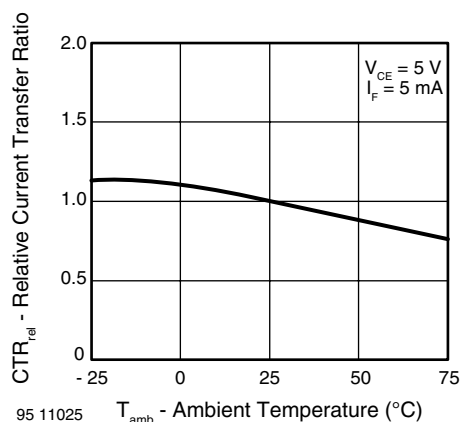


Fig. 6 - Relative Current Transfer Ratio vs. Ambient Temperature

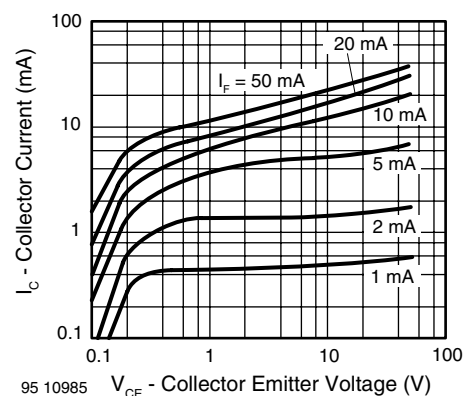


Fig. 9 - Collector Current vs. Collector Emitter Voltage

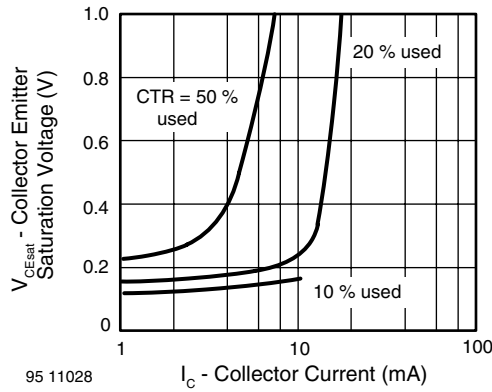


Fig. 10 - Collector Emitter Saturation Voltage vs. Collector Current

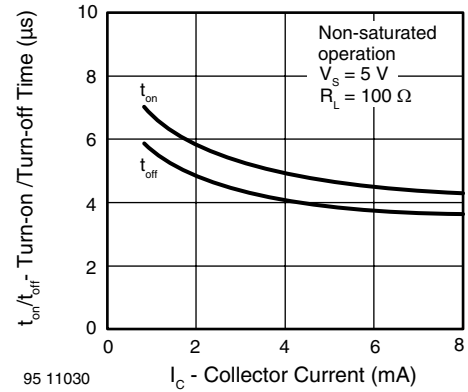


Fig. 13 - Turn-on/off Time vs. Collector Current

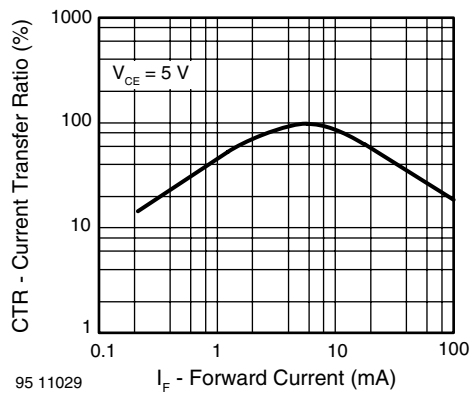


Fig. 11 - Current Transfer Ratio vs. Forward Current

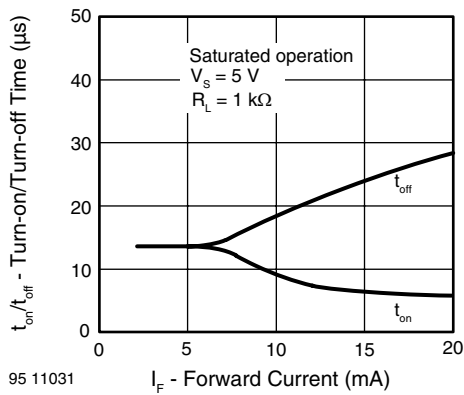
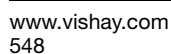


Fig. 12 - Turn-on/Turn-off Time vs. Forward Current

Vishay Semiconductors Optocoupler, Phototransistor Output





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