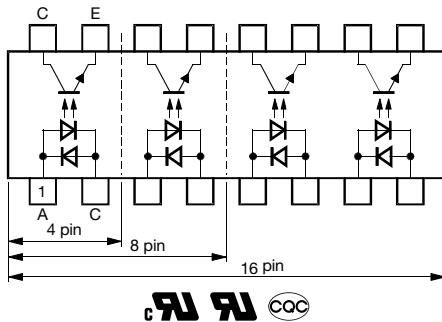
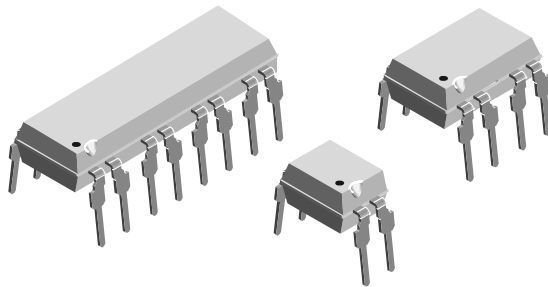




Optocoupler, Phototransistor Output, AC Input



FEATURES

- Endstackable to 2.54 mm (0.1") spacing
- DC isolation test voltage $V_{ISO} = 5000 V_{RMS}$
- Low coupling capacitance of typical 0.3 pF
- Current transfer ratio (CTR) of typical 100 %
- Low temperature coefficient of CTR
- Wide ambient temperature range
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

APPLICATIONS

- Feature phones
- Answering machines
- PBX
- Fax machines

AGENCY APPROVALS

- [UL](#)
- [cUL](#)
- [CQC](#)

LINKS TO ADDITIONAL RESOURCES

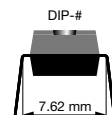
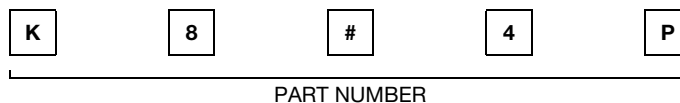


DESCRIPTION

The K814P, K824P, K844P consist of a phototransistor optically coupled to 2 gallium arsenide infrared emitting diodes (reverse polarity) in 4 pin (single); 8 pin (dual) or 16-pin (quad) plastic dual inline package.

The elements are mounted on one leadframe providing a fixed distance between input and output for highest safety requirements.

ORDERING INFORMATION



AGENCY CERTIFIED / PACKAGE	CTR (%)
UL, cUL	> 20
DIP-4, single channel	K814P
DIP-8, dual channel	K824P
DIP-16, quad channel	K844P



ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)				
PARAMETER	CONDITION	SYMBOL	VALUE	UNIT
INPUT				
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	$^{\circ}\text{C}$
COUPLER				
AC isolation test voltage (RMS)	$t = 1.0\text{ min}$	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 ⁽¹⁾	2 mm from case, $t \leq 10\text{ s}$	T_{sld}	260	$^{\circ}\text{C}$

Notes

- 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.

⁽¹⁾ Refer to reflow profile for soldering conditions for surface mounted devices

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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
Reverse current	$V_R = \pm 6\text{ V}$	I_R	-	-	10	μA
OUTPUT						
Collector emitter breakdown voltage	$I_C = 100\text{ }\mu\text{A}$	BV_{CEO}	70	-	-	V
Emitter collector breakdown voltage	$I_E = 10\text{ }\mu\text{A}$	BV_{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	$I_F = \pm 10\text{ mA}, I_C = 1\text{ mA}$	V_{CEsat}	-	-	0.3	V
Cut-off frequency	$I_F = \pm 10\text{ mA}, V_{CE} = 5\text{ V}, R_L = 100\text{ }\Omega$	f_c	-	100	-	kHz
Coupling capacitance	$f = 1\text{ MHz}$	C_k	-	0.3	-	pF

Note

- 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 ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.
I_C/I_F	$I_F = \pm 5\text{ mA}, V_{CE} = 5\text{ V}$	K814P	CTR	20	-	300
						%

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

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

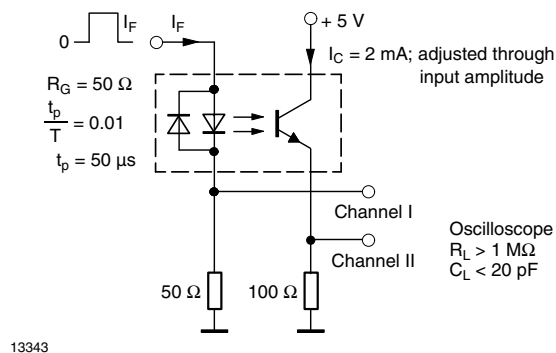


Fig. 1 - Test Circuit, Non-Saturated Operation

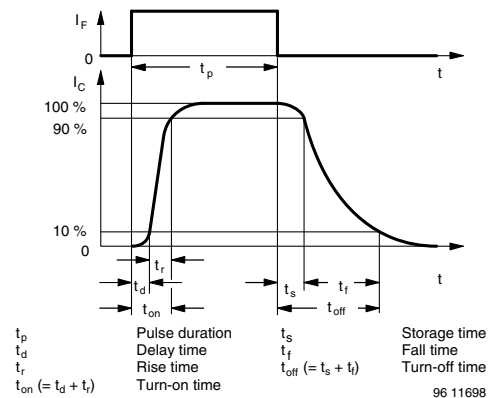


Fig. 3 - Switching Times

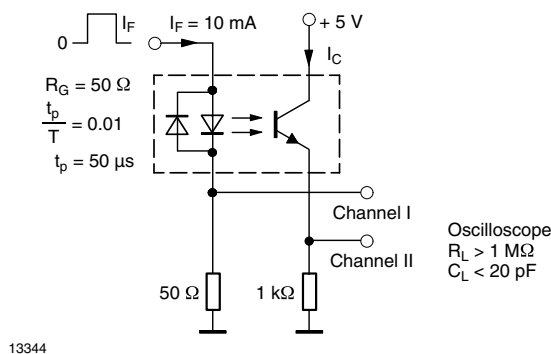


Fig. 2 - Test Circuit, Saturated Operation

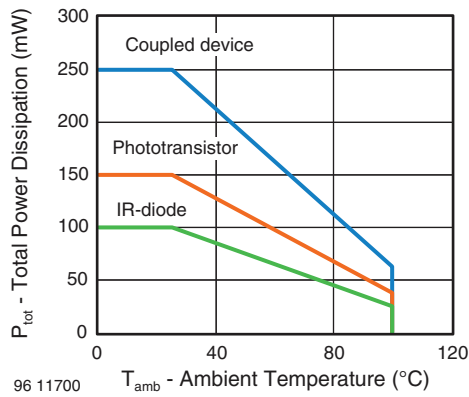
**TYPICAL CHARACTERISTICS** ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

Fig. 4 - Total Power Dissipation vs. Ambient Temperature

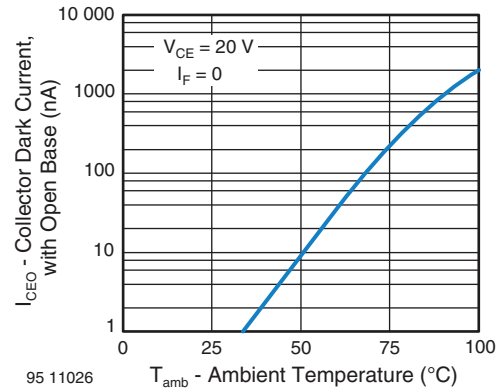


Fig. 7 - Collector Dark Current vs. Ambient Temperature

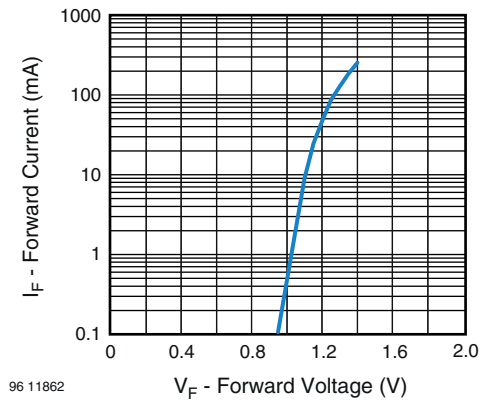


Fig. 5 - Forward Current vs. Forward Voltage

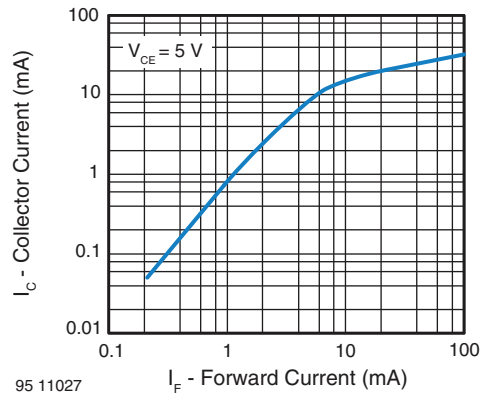


Fig. 8 - Collector Current vs. Forward Current

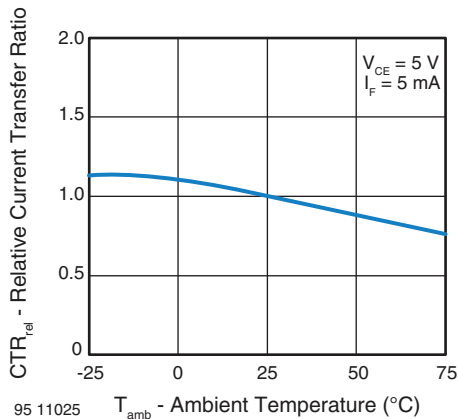


Fig. 6 - Relative Current Transfer Ratio vs. Ambient Temperature

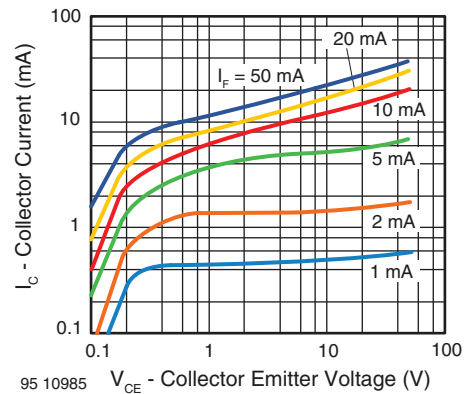


Fig. 9 - Collector Current vs. Collector Emitter Voltage

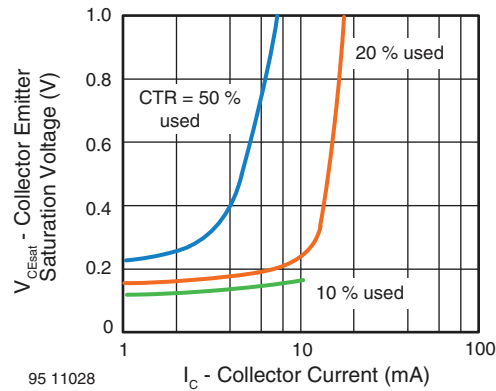


Fig. 10 - Collector Emitter Saturation Voltage vs. Collector Current

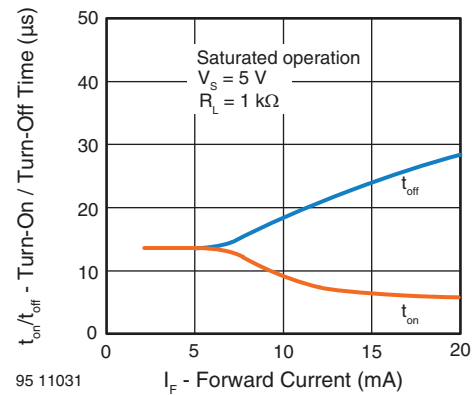


Fig. 12 - Turn-on / Turn-off Time vs. Forward Current

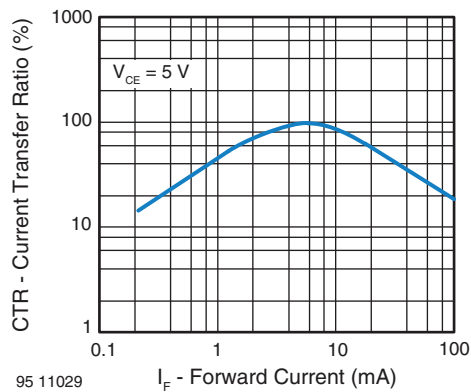


Fig. 11 - Current Transfer Ratio vs. Forward Current

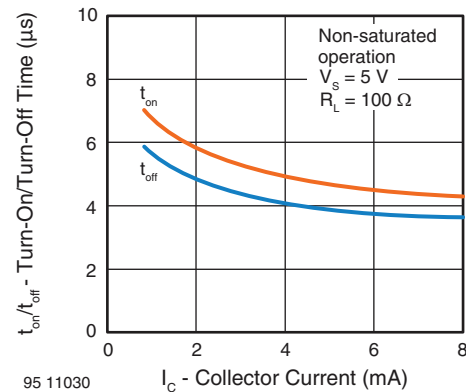
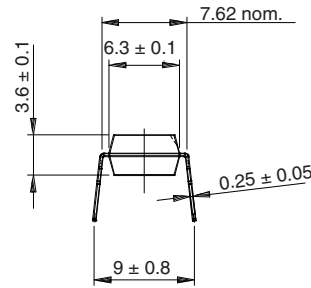
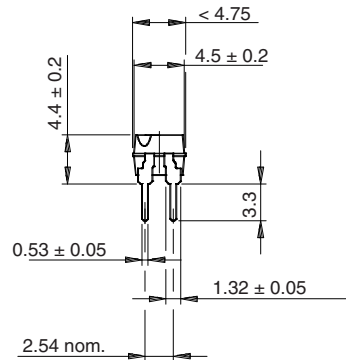
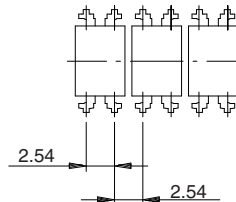
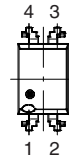


Fig. 13 - Turn-on / Turn-off Time vs. Collector Current

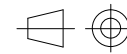
**PACKAGE DIMENSIONS** in millimeters

E. g.:
Special features: endstackable
to 2.54 mm (0.100") spacing

Weight: ca. 0.25 g
Creepage distance: > 6 mm
Air path: > 6 mm
after mounting on PC board

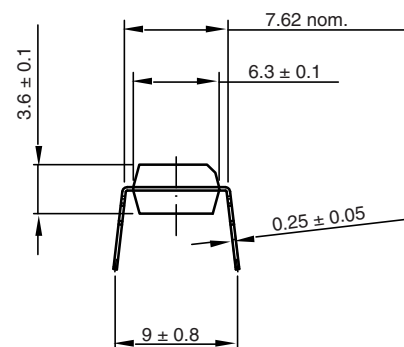
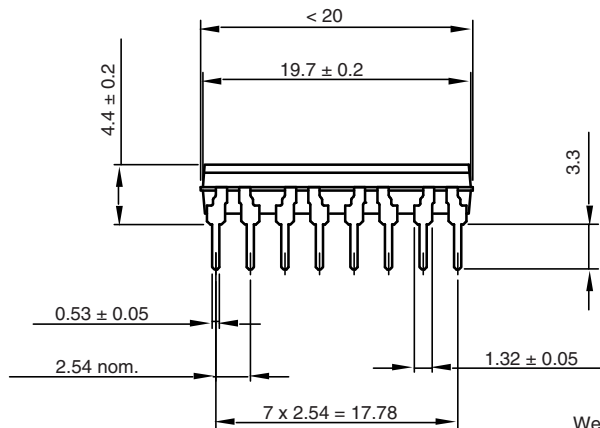


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Issue: 5; 20.03.02

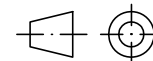


technical drawings
according to DIN
specifications

14789



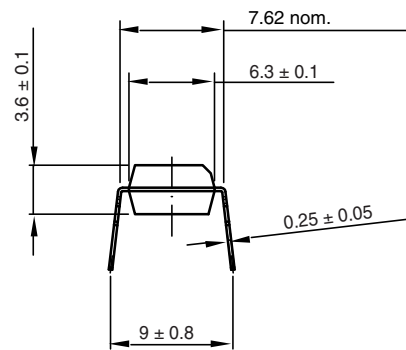
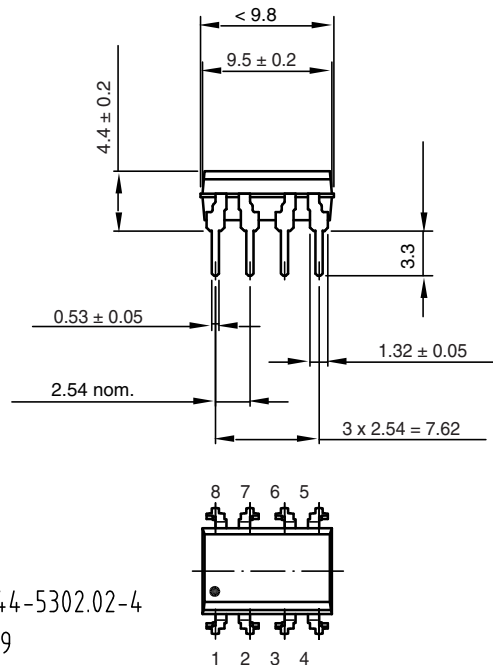
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Creepage distance: > 6 mm
Air path: > 6 mm
after mounting on PC board



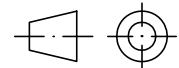
technical drawings
according to DIN
specifications

14783

Drawing-No.: 6.544-5302.01-4
Issue: 4; 02.06.99



Weight: ca. 0.55 g
 Creepage distance: > 6 mm
 Air path: > 6 mm
 after mounting on PC board

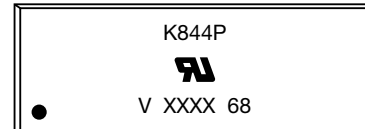
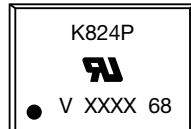
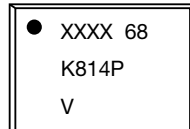


technical drawings
 according to DIN
 specifications

14784

Drawing-No.: 6.544-5302.02-4
 Issue: 4; 02.06.99

PACKAGE MARKING (example)



Note

- XXXX = LMC (lot marking code)



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