CNY 17F-1X, CNY 17F-2X, CNY 17F-3X, CNY 17F-4X

OPTICALLY COUPLED ISOLATOR
NON-BASE LEAD
TRANSISTOR OUTPUT

DESCRIPTION

The CNY 17 is a optically coupled isolator consisting of a Gallium Arsenide infrared emitting diode and a NPN silicon phototransistor mounted in a standard 6-pin dual-in-line package.

NOTES

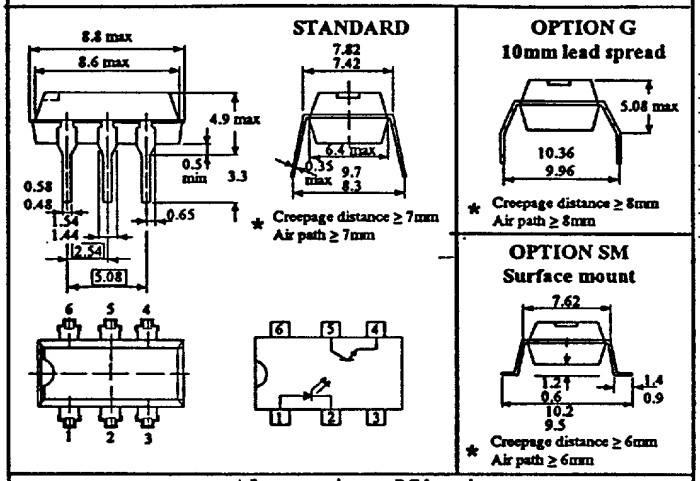
1 a. The product type number consists of the basic product type followed by the letter "X" which indicates VDE 0884 approval of the basic part.

b. Letter "X" supercedes letter "V" which denoted the now obsolete VDE 0883 approval.

2. For 10mm lead spread requirements add suffix G.

3. For surface mount requirements add suffix SM.

PACKAGE DIMENSIONS IN MM



* After mounting on PC board

APPROVALS

DIN VDE 0884. Marks Licence No. 70910
UL 1577 File No. E91231
BSI 415 Certificate No. 7209

0884 V DE

FEATURES

Rated Impulse Voltage (Transient Overvoltage)
V_{IOTM} = 6kV peak

Insulation Test Voltage (Partial Discharge Test)
Vpd = 1.4kV peak

Rated Insulation Voltage (RMS includes d.c.)
V_{IOWM} = 600 V_{RMS} (848V peak)

Rated Recurring Peak Voltage (repetitive)
V_{IORM} = 600 V_{RMS}

Isolation Materials according to UL 94

Creeping Current Resistance according to VDE 0303 / IEC 112

Comparative Tracking Index CTI 275 (VDE 0109)

Climatic Classification 55/100/21 (IEC 68 Part 1)

Pollution Degree 2 (VDE 0109)

APPLICATIONS

These couplers meet the requirements of the following Equipment Standards

VDE 0109 0110	Circuits for safe protective separation against electrical shock according to safety class II (reinforced isolation). Application class I-IV at mains voltages ≤300V. Application class I-III at mains voltage ≤600V.
VDE 0804	Telecommunication Apparatus and Data Processing
VDE 0805/ IEC 435	Data Processing Equipment (Option G only)
VDE 0806/ IEC 950	Office Machines (Option G only)
VDE 0860/ IEC 65	Safety for Mains Operated Electronic and Related Apparatus for Household.
UL 1577	Standard for Safety . Optical isolated switch systems. Package type K.
BS 415/ IEC 65	Safety requirements for mains operated electronic and related apparatus for household and similar general use. Class II applications.
BS 7002/ IEC 950	Specification for safety of information technology equipment including electrical business equipment (Option G only)

ISOCOM COMPONENTS LTD.
Unit 25B, Park View Road West, Park View Industrial Estate, Brenda Road,
Hartlepool, Cleveland, England, TS25 1YD.
Tel: (0429) 863609. Fax: (0429) 863581. Telex: 587712 ISCOMPG.

ISOCOM INC.
274 East Hamilton Avenue, Suite E, Campbell, California, 95008, U.S.A.
Tel: (408) 370 2212 Fax: (408) 370 2309

ABSOLUTE MAXIMUM RATINGS (25°c UNLESS OTHERWISE NOTED)

Storage Temperature	-55°C to +125°C
Operating Temperature	-55°C to +100°C
Lead Soldering Temperature (2mm from case for 10 seconds)	260°C
Input-to-Output Isolation Voltage	± 5300 Vdc

ISOCOM COMPONENTS LTD

INPUT DIODE

Forward D.C. Current	60mA
Reverse D.C. Voltage	6V
Peak Forward Current (tp ≤ 10 μs)	2.5A
Power Dissipation (derate linearly 1.33mW/°C above 25°C)	100mW
Junction Temperature	100°C

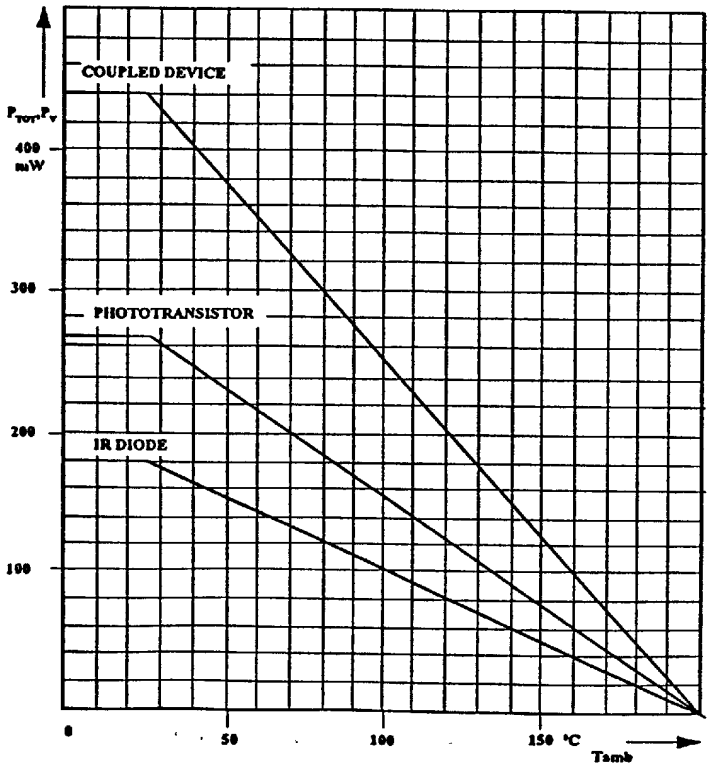
OUTPUT TRANSISTOR

Collector-emitter Voltage BV_{CEO}	70V
Emitter-collector Voltage BV_{BCO}	7V
Collector Current	50mA
Collector Current (t ≤ 1ms)	100mA
Power Dissipation (derate linearly 2.00mW/°C above 25°C)	150mW
Junction Temperature	100°C

PACKAGE

Total Power Dissipation (derate linearly 3.3mW/°C above 25°C)	250mW

MAXIMUM SAFETY DERATING CURVE



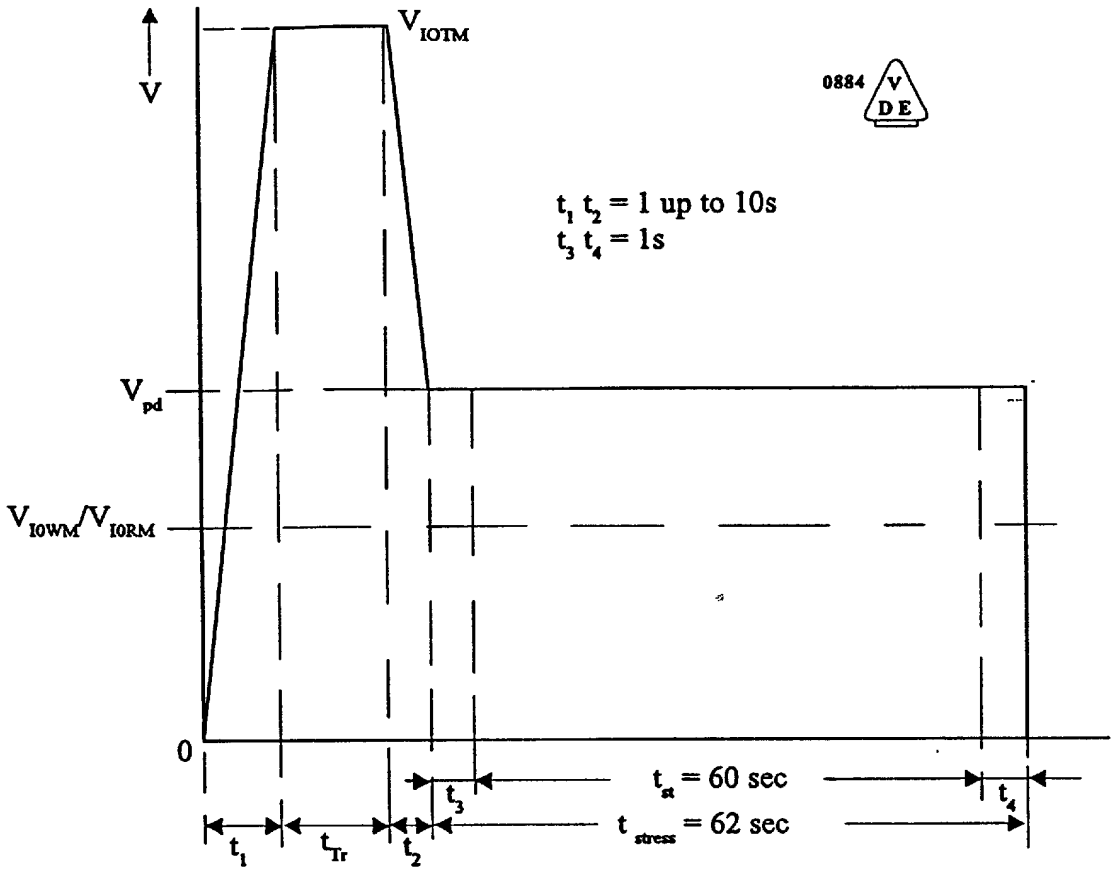
0884 VDE

MAXIMUM SAFETY RATINGS

Input Diode I_{si}	130 mA max
Output Transistor P_{si}	265 mW max
Coupled Device	
Impulse Voltage V_{IOTM}	6 KV max
Safety Temperature T_{si}	200°C max

Note
This device is suitable for safe electrical isolation only within the maximum safety ratings.
This must be ensured by protective circuits in the applications.

TEST PULSE DIAGRAM FOR SAMPLE TESTS acc. DIN VDE 0884



INSULATION RATED PARAMETERS

PARAMETER		TEST CONDITIONS	SYMBOL	MIN	MAX	UNIT
Partial Discharge Test Voltage	routine test	100% t_m = 1s	V_{pd}	1.4		kV
	lot test (sample test)	t_{Tr} = 10 s t_{st} = 60 s see Test Pulse Diagram	V_{IOTM}	6		kV
			V_{pd}	1.05		kV
Insulation Resistance		V_{IO} = 500V, T_{amb} = 25°C	R_{IS}	10^{12}		OHM
		V_{IO} = 500V, T_{amb} = 100°C	R_{IS}	10^{11}		OHM
		V_{IO} = 500V, T_{si} = 200°C (only construction test)	R_{IS}	10^{9}		OHM

T-41-83

ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

	Parameter	Min.	Typ	Max.	Units	Test Condition
Input	Forward Voltage (V_F)		1.2	1.65	Volt	I_F = 60 mA
	Capacitance		45		pF	V_R = 0, f = 1 MHz
	Reverse Current (I_R)			10	µA	V_R = 6 V
	Reverse Breakdown Voltage (V_R)	6.0			Volt	I_R = 100 µA
Output	Collector-emitter Voltage (BV_{CEO})	70			Volt	I_C = 1 mA, I_B = 0
	Emitter-collector Voltage (BV_{ECO})	7			Volt	I_E = 100 µA, I_C = 0
	Capacitance (C_{CE})		6.8		pF	V_{CE} = 5V, f = 1 MHz
	Leakage Current (I_{CEO})					
	CNY17F-1X, CNY17F-2X,		5	50	nA	V_{CE} = 10V, I_F = 0
	CNY17F-3X, CNY17F-4X		15	100	nA	
Coupled	DC Current Transfer Ratio I_C / I_F					
	CNY17F-1X	40		80	%	I_F = 10 mA, V_{CE} = 5V
	CNY17F-2X	63		125	%	Note 2
	CNY17F-3X	100		200	%	
	CNY17F-4X	160		320	%	
	CNY17F-1X	13			%	I_F = 1 mA, V_{CE} = 5V
	CNY17F-2X	22			%	
	CNY17F-3X	34			%	
	CNY17F-4X	56			%	
	Input-to-Output Isolation Resistance (R_{IO})	10^{11}			ohm	V_{IO} = 500V, (note 1)
	Collector-emitter Saturation Voltage V_{CE} (SAT)		0.2	0.4	Volt	I_F = 10 mA, I_C = 2.5 mA
	Capacitance Input to Output (C_{IO})		0.6		pF	f = 1MHz (note 1)

Note 1. Measured with input leads shorted together and output leads shorted together.
2. We are also willing to offer other CTR parameter selections if required. Please contact our factory to discuss requirements in detail.

SWITCHING CHARACTERISTICS

1. Linear Operation (without saturation) Fig 1
I_F = 10mA, V_{CC} = 5V, R_L = 75R

		TYP	MAX	UNITS
Turn-On Time	t_{on}	3.8	5.6	µs
Rise Time	t_r	2.8	4.0	µs
Turn-Off Time	t_{off}	3.5	4.1	µs
Fall Time	t_f	3.0	3.5	µs
Cut-Off Frequency	F_{CO}		250	kHz

2. Switching Operation (with saturation) Fig 2
V_{CC} = 5V, R_L = 1KR

GROUP		-1X (I_F=20mA)		-2X and -3X (I_F=10mA)		-4X (I_F=5mA)		UNITS
		TYP	MAX	TYP	MAX	TYP	MAX	
Turn-On Time	t_{on}	4.0	5.5	5.0	8.0	6.0	10.5	µs
Rise Time	t_r	3.0	4.0	3.5	6.0	5.2	8.0	µs
Turn-Off Time	t_{off}	26	34	28	39	30	43	µs
Fall Time	t_f	15	20	17	24	19	26	µs
	V_{CESAT}	≤ 0.4						V