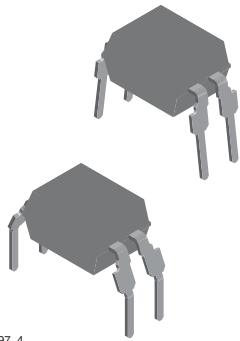
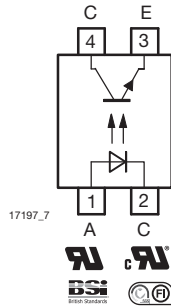


Optocoupler with Transistor Output



17197_4



17197_7



FEATURES

- Rated impulse voltage (transient overvoltage) $V_{IOTM} = 6 \text{ kV}_{peak}$
- Isolation test voltage (partial discharge test voltage) $V_{pd} = 1.6 \text{ kV}$
- Rated isolation voltage (RMS includes DC) $V_{IOWM} = 600 \text{ V}_{RMS}$
- Rated recurring peak voltage (repetitive) $V_{IORM} = 850 \text{ V}_{peak}$
- Creepage current resistance according to IEC 112, comparative tracking index: $CTI \geq 250$
- Thickness through insulation $\geq 0.4 \text{ mm}$
- Isolation materials according to UL 94 V-O
- Pollution degree 2 (resp. IEC 664)
- Climatic classification 55/100/21 (IEC 68 part 1)
- Low temperature coefficient of CTR
- G = leadform 10.16 mm; provides creepage distance $> 8 \text{ mm}$, suffix letter "G" is not marked on the optocoupler
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



RoHS COMPLIANT

DESCRIPTION

The HS817 series consists of a phototransistor optically coupled to a gallium arsenide infrared-emitting diode in a 4-lead plastic dual inline package.

AGENCY APPROVALS

- BSI: EN 60065, EN 60950-1:2006
- FIMKO
- UL file no. E52744
- cUL tested to CSA 22.2 bulletin 5A

APPLICATIONS

- Switch-mode power supplies
- Line receiver
- Computer peripheral interface
- Microprocessor system interface

ORDERING INFORMATION		
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px 5px;">H</div> <div style="border: 1px solid black; padding: 2px 5px;">S</div> <div style="border: 1px solid black; padding: 2px 5px;">8</div> <div style="border: 1px solid black; padding: 2px 5px;">1</div> <div style="border: 1px solid black; padding: 2px 5px;">7</div> </div> <p style="text-align: center;">PART NUMBER</p>	<div style="border: 1px solid black; padding: 2px 5px;">x</div> <p>CTR BIN</p>	<div style="border: 1px solid black; padding: 2px 5px;">x</div> <p>PACKAGE OPTION</p>
	<p>DIP-#</p>	<p>DIP-#, 400 mil</p>
AGENCY CERTIFIED/PACKAGE	CTR (%)	
UL, cUL, BSI, FIMKO	100 to 300	130 to 260
DIP-4	HS817	HS817B
DIP-4, 400 mil	HS817G	HS817BG

Notes

- G = leadform 10.16 mm; G is not marked on the body.
- For additional information on the available options refer to option information.

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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	$T_{amb} \leq 25\text{ }^{\circ}\text{C}$	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	$T_{amb} \leq 25\text{ }^{\circ}\text{C}$	P_{diss}	150	mW
Junction temperature		T_j	125	$^{\circ}\text{C}$
COUPLER				
Isolation test voltage (RMS)	$t = 1\text{ s}$	V_{ISO}	5	kV
Total power dissipation	$T_{amb} \leq 25\text{ }^{\circ}\text{C}$	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_{slid}	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 wave profile for soldering conditions for through hole devices.

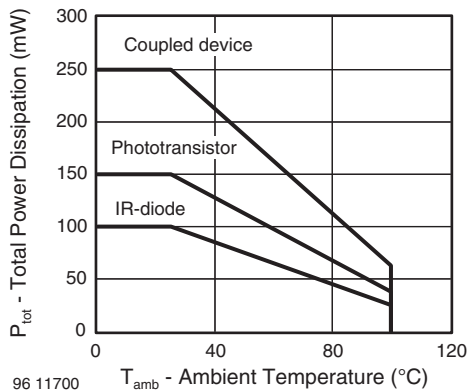


Fig. 1 - Total Power Dissipation vs. Ambient Temperature



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		1.43	1.6	V
Junction capacitance	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$	C_j		50		pF
OUTPUT						
Collector emitter voltage	$I_C = 1\text{ mA}$	V_{CEO}	70			V
Emitter collector voltage	$I_E = 100\text{ }\mu\text{A}$	V_{ECO}	7			V
Collector emitter cut-off current	$V_{CE} = 20\text{ V}$, $I_F = 0\text{ A}$	I_{CEO}		10	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	$V_{CE} = 5\text{ V}$, $I_F = 10\text{ mA}$, $R_L = 100\text{ }\Omega$	f_c		110		kHz
Coupling capacitance	$f = 1\text{ MHz}$	C_k		0.6		pF

Note

- Minimum and maximum values were tested requirements. Typical values are characteristics of the device and are the result of engineering evaluations. 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 NUMBER	SYMBOL	MIN.	TYP.	MAX.	UNIT
I_C/I_F	$V_{CE} = 5\text{ V}$, $I_F = 5\text{ mA}$	HS817	CTR	100		300	%
		HS817G	CTR	100		300	
		HS817B	CTR	130		260	
		HS817BG	CTR	130		260	

SAFETY AND INSULATION PARAMETERS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Insulation resistance	$V_{IO} = 500\text{ V}$	R_{IO}	10^{12}			Ω
	$V_{IO} = 500\text{ V}$, $T_{amb} = 100\text{ }^{\circ}\text{C}$	R_{IO}	10^{11}			Ω
	$V_{IO} = 500\text{ V}$, $T_{amb} = 150\text{ }^{\circ}\text{C}$ (construction test only)	R_{IO}	10^9			Ω
Rated impulse voltage		V_{IOTM}			6	kV
Max. working voltages	Recurring peak voltage	V_{IORM}	850			V_{peak}
Forward current		I_{SI}			130	mA
Power dissipation	$T_{amb} \leq 25\text{ }^{\circ}\text{C}$	P_{SO}			265	mW
Safety temperature		T_{SI}			150	$^{\circ}\text{C}$
Creepage distance					7.6	mm

Note

- This optocoupler is suitable for safe electrical isolation only within the safety ratings. Compliance with the safety ratings shall be ensured by means of suitable protective circuits.

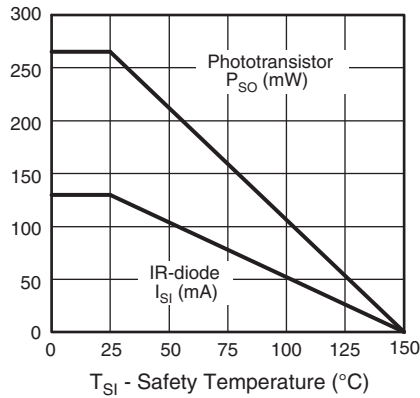


Fig. 2 - Derating Diagram

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 figure 3)	t_d		3		μs
Rise time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\text{ }\Omega$, (see figure 3)	t_r		3		μs
Fall time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\text{ }\Omega$, (see figure 3)	t_f		4.7		μs
Storage time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\text{ }\Omega$, (see figure 3)	t_s		0.3		μs
Turn-on time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\text{ }\Omega$, (see figure 3)	t_{on}		6		μs
Turn-off time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\text{ }\Omega$, (see figure 3)	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 4)	t_{on}		2		μs
Turn-off time	$V_S = 5\text{ V}$, $I_F = 10\text{ mA}$, $R_L = 1\text{ k}\Omega$, (see figure 4)	t_{off}		18		μs

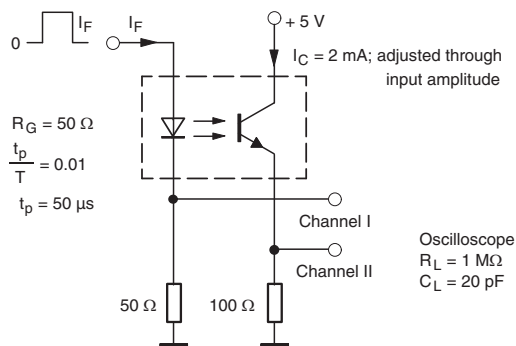


Fig. 3 - Test Circuit, Non-Saturated Operation

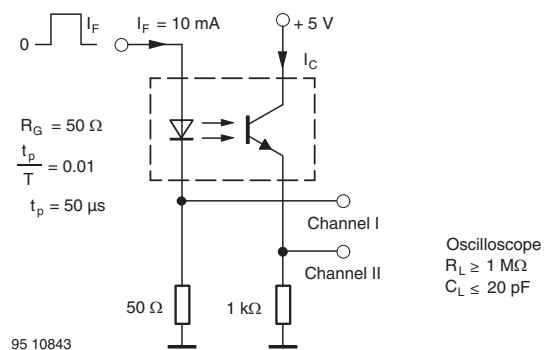


Fig. 4 - Test Circuit, Saturated Operation

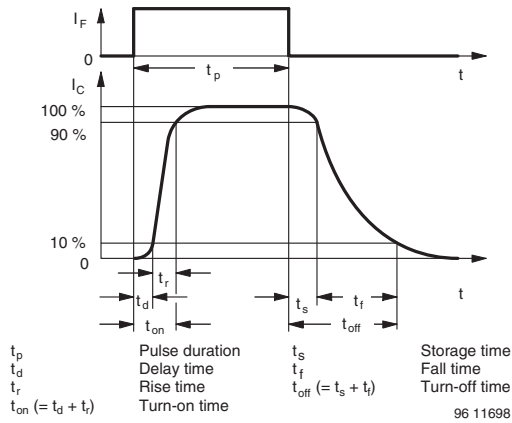


Fig. 5 - Switching Times

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

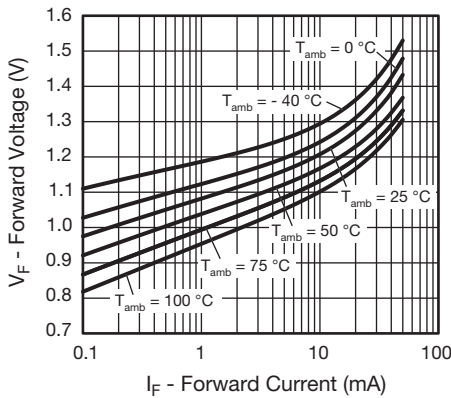


Fig. 6 - Forward Voltage vs. Forward Current

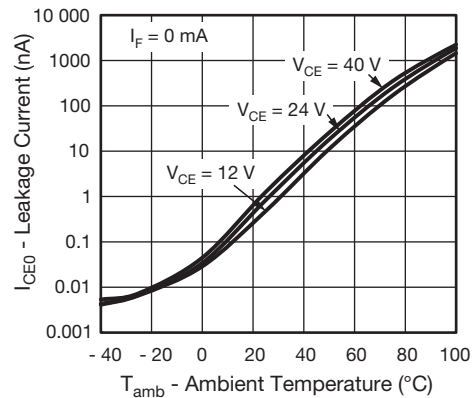


Fig. 8 - Leakage Current vs. Ambient Temperature

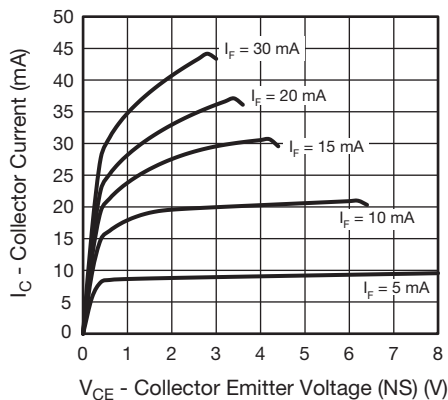


Fig. 7 - Collector Current vs. Collector Emitter Voltage (NS)

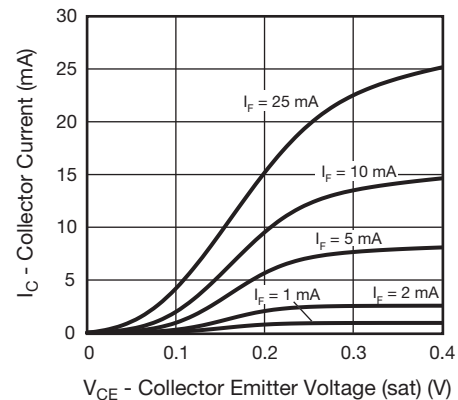


Fig. 9 - Collector Current vs. Collector Emitter Voltage (sat)

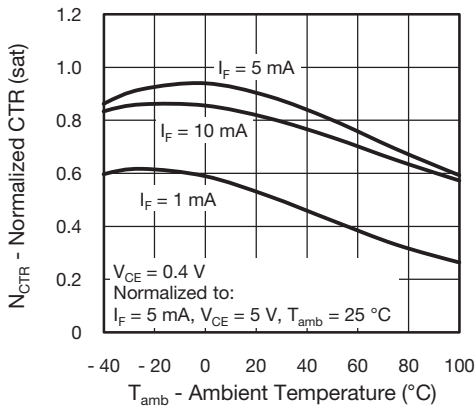


Fig. 10 - Normalized CTR (sat) vs. Ambient Temperature

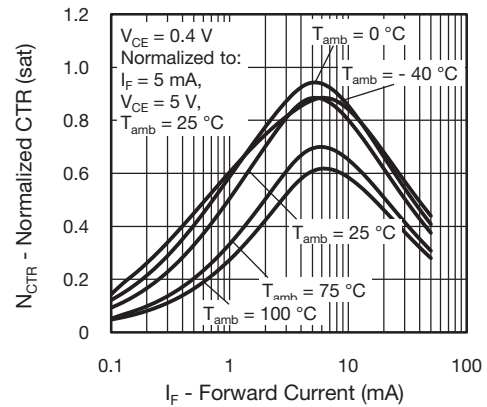


Fig. 13 - Normalized CTR (sat) vs. Forward Current

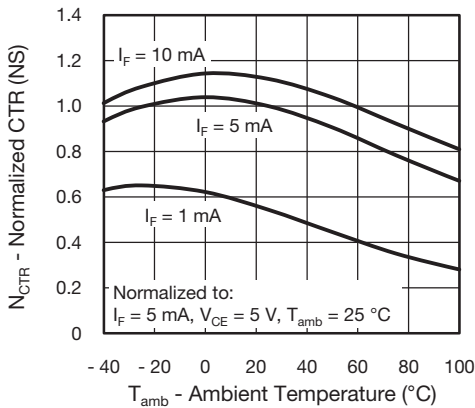


Fig. 11 - Normalized CTR (NS) vs. Ambient Temperature

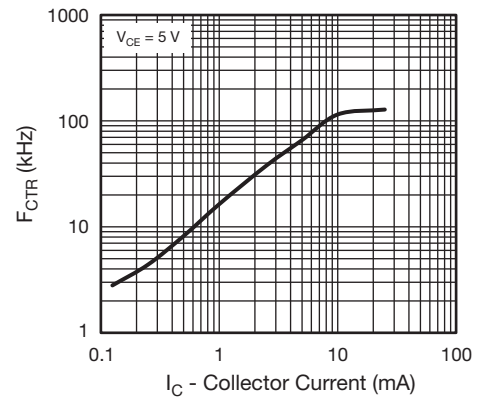


Fig. 14 - F_{CTR} vs. Collector Current

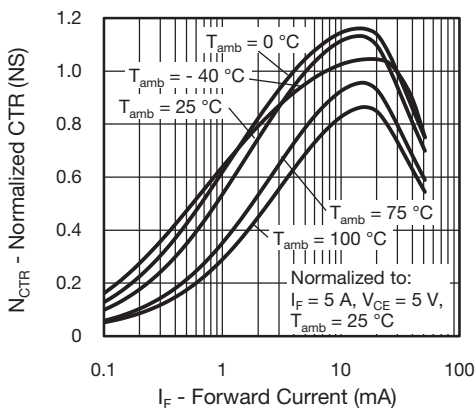


Fig. 12 - Normalized CTR (NS) vs. Forward Current

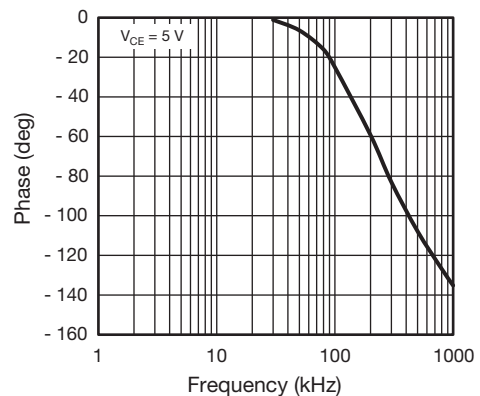


Fig. 15 - F_{CTR} vs. Phase Angle

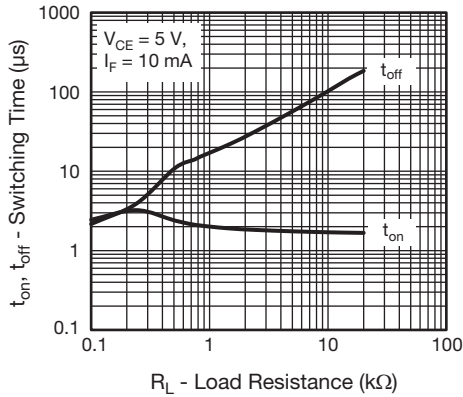
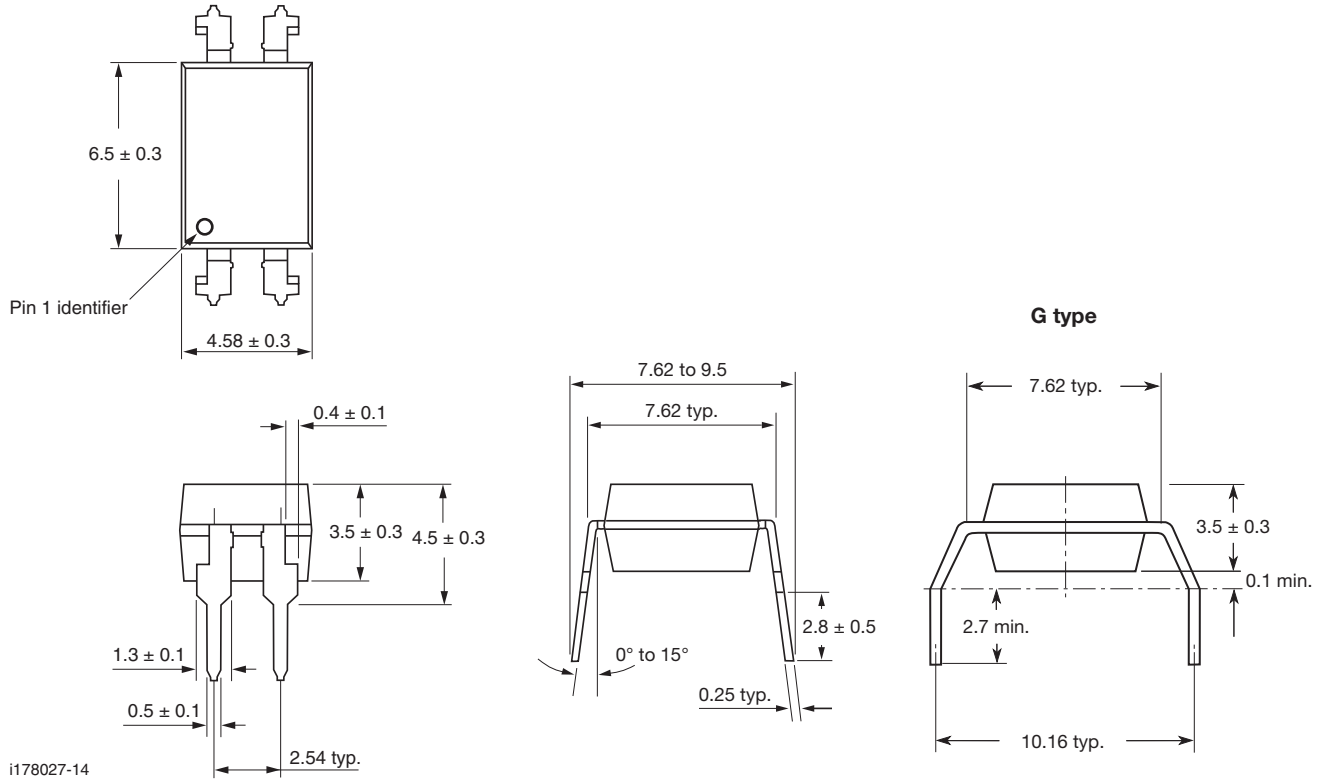


Fig. 16 - Switching Time vs. Load Resistance

PACKAGE DIMENSIONS in millimeters



PACKAGE MARKING (example)





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