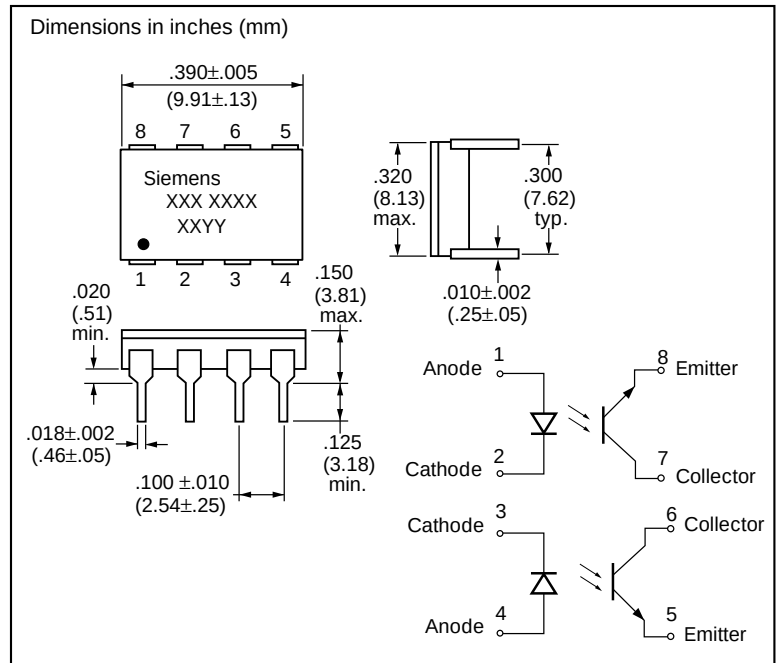


FEATURES

- Operating Temperature Range, -55°C to $+125^{\circ}\text{C}$
- Current Transfer Ratio Guaranteed from -55°C to $+100^{\circ}\text{C}$ Ambient Temperature Range
- High Current Transfer Ratio at Low Input Current
- Isolation Test Voltage, 3000 VDC
- Two Isolated Channels per Package
- Standard 8 Pin DIP Package

DESCRIPTION

The ILH200 is designed especially for hi-rel applications requiring optical isolation with high current transfer ratio and low saturation V_{CE} . Each channel of the optocoupler consists of a light emitting diode and a NPN silicon phototransistor mounted and coupled in an 8 pin hermetically sealed DIP package. The low input current makes the ILH200 well suited for direct CMOS to LSTTL/TTL interfaces.



Maximum Ratings

Emitter (per channel)

Reverse Voltage	6.0 V
Forward Current	60 mA
Peak Forward Current ⁽¹⁾	1 A
Power Dissipation.....	75 mW
Derate Linearly from 25°C	0.75 mW/°C

Detector (per channel)

Collector-Emitter Voltage	70 V
Emitter-Collector Voltage	7 V
Continuous Collector Current.....	50 mA
Power Dissipation.....	100 mW
Derate Linearly from 25°C	1.0 mW/°C

Package

Input to Output Isolation Test Voltage ⁽²⁾	3000 VDC
Storage Temperature Range	-65°C to $+150^{\circ}\text{C}$
Operating Temperature Range.....	-55°C to $+125^{\circ}\text{C}$
Junction Temperature.....	150°C
Soldering Time at 240°C, 1.6 mm from case	10 sec.
Power Dissipation.....	350 mW
Derate Linearly from 25°C	3.5 mW/°C

Notes:

1. Values applies for $P_W \leq 1$ ms, $PRR \leq 300$ pps.
2. Measured between pins 1,2,3 and 4 shorted together and pins 5,6,7 and 8 shorted together. $T_A = 25^{\circ}\text{C}$ and duration=1 second, RH=45%.

Characteristics (Each Channel), $T_A=25^{\circ}\text{C}$, unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Emitter						
Forward Voltage	V_F		1.46	1.7	V	$I_F=60\text{ mA}$
Reverse Breakdown Voltage	V_{BR}	6			V	$I_R=10\text{ }\mu\text{A}$
Reverse Current	I_R		0.01	10	μA	$V_R=6\text{ V}$
Capacitance	C_J		20		pF	$V_F=0\text{ V}$, $f=1\text{ MHz}$
Thermal Resistance	R_{TH}		220		$^{\circ}\text{C/W}$	Junction to Lead
Detector						
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		0.25	0.4	V	$I_B=20\text{ }\mu\text{A}$, $I_{CE}=1\text{ mA}$
Collector-Emitter Leakage Current	I_{CEO}		5	50	nA	$V_{CE}=10\text{ V}$
Capacitance	C_{CE}		6.8		pF	$V_{CE}=5\text{ V}$, $f=1\text{ MHz}$
Thermal Resistance	R_{TH}		220		$^{\circ}\text{C/W}$	Junction to Lead
Coupled Characteristic -55°C to 100°C						
Saturated Current Transfer Ratio	$CTR_{(sat)}$	70	210	250	%	$I_F=10\text{ mA}$, $V_{CE}=0.4\text{ V}$
Current Transfer Ratio Collector-Emitter	CTR_{ce}	100	300	450	%	$I_F=10\text{ mA}$, $V_{CE}=10\text{ V}$
Isolation and Insulation						
Common Mode Rejection, Output High	CM_H	1000	2000		V/ μs	$V_{CM}=500\text{ V}_{p-p}$, $V_{CC}=5\text{ V}$, $R_L=1\text{ K}\Omega$, $I_F=0\text{ mA}$
Common Mode Rejection, Output High	CM_L	1000	2000		V/ μs	$V_{CM}=500\text{ V}_{p-p}$, $V_{XX}=5\text{ V}$, $R_L=1\text{ K}\Omega$, $I_F=10\text{ mA}$
Package Capacitance	C_{IO}		1.5		pF	$V_{IO}=0\text{ V}$, 1 MHz
Insulation Resistance	R_{IO}	10^{11}	10^{14}		W	$V_{IO}=500\text{ VDC}$
Leakage Current, Input-Output	I_{IO}			10	μA	Relative Humidity $\leq 50\%$, $V_{IO}\text{ }3000\text{ VDC}$, 5 sec.

Typical Switching Speeds, $T_A=25^{\circ}\text{C}$

Non-Saturated Switching	Symbol	Typ.	Max.	Unit	Test Condition
Delay	td	0.8	2	μs	
Rise	tr	2	5	μs	$V_{CC}=5\text{ V}$
Storage	ts	0.4	1.5	μs	$R_L=75\text{ }\Omega$
Fall	tf	2	5	μs	$I_F=10\text{ mA}$
Propagation-High to Low	tpHL	1	3	μs	50% of V_{pp}
Propagation-Low to High	tpLH	1.5	4	μs	
Saturated Switching ⁽¹⁾	Symbol	Typ.	Max.	Unit	Test Condition
Delay	td	0.7	2	μs	
Rise	tr	1	3	μs	$V_{CE}=0.4\text{ V}$
Storage	ts	13.5	30	μs	$R_L=1\text{ K}\Omega$
Fall	tf	12	30	μs	$I_F=10\text{ mA}$
Propagation-High to Low	tpHL	1.4	5	μs	$V_{CC}=5\text{ V}$, $V_{TH}=1.5\text{ V}$
Propagation-Low to High	tpLH	15	40	μs	

Figure 1. Forward current versus forward voltage and temperature

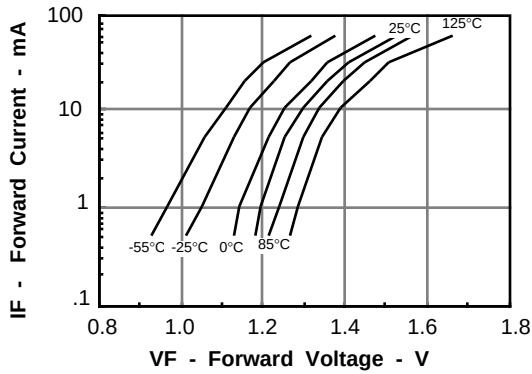


Figure 2. Peak LED current versus duty factor refresh rate and temperature

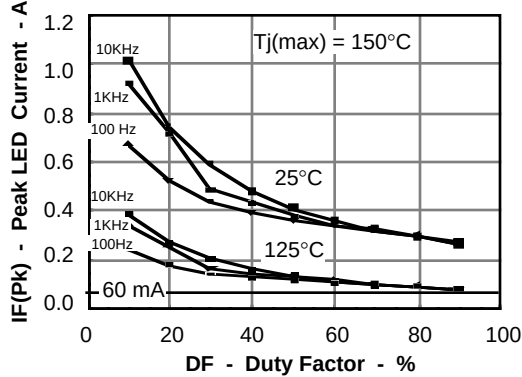


Figure 3. Normalized non-saturated current transfer ratio versus temperature and LED current

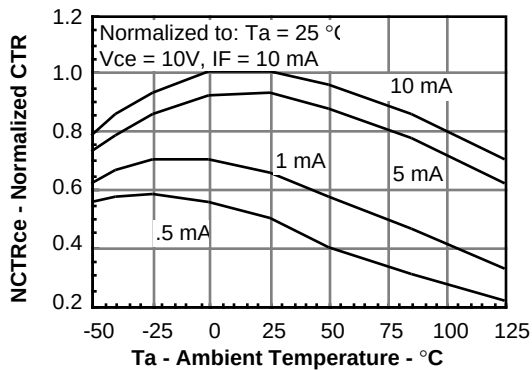


Figure 4. Normalized non-saturated current transfer ratio versus temperature and LED current

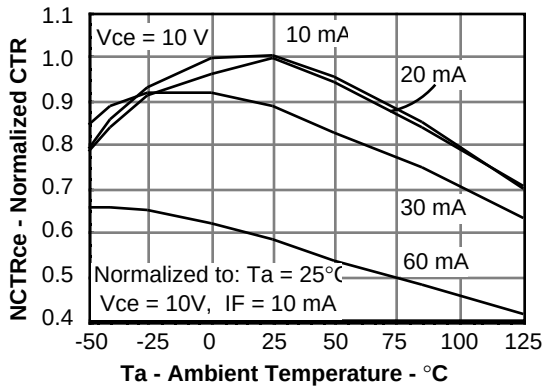


Figure 5. Normalized saturated current transfer ratio versus temperature and LED current

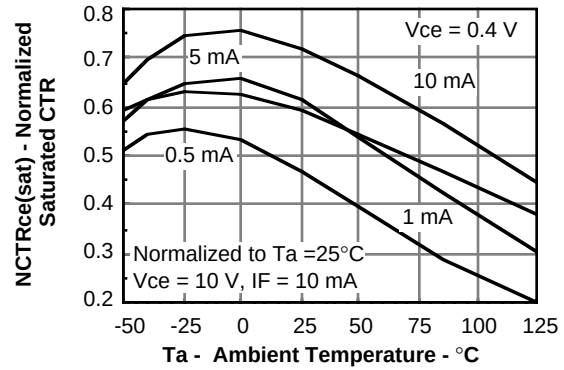


Figure 6. Normalized saturated current transfer ratio versus temperature and LED current

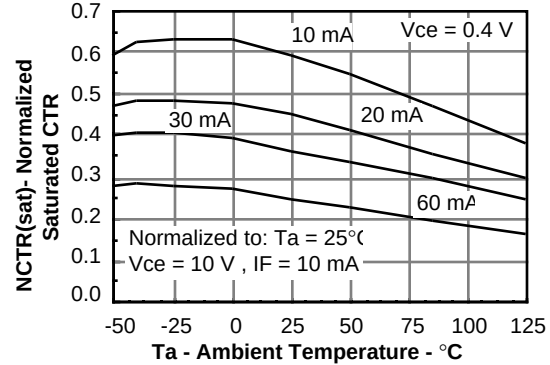


Figure 7. Collector-emitter current versus temperature and LED current

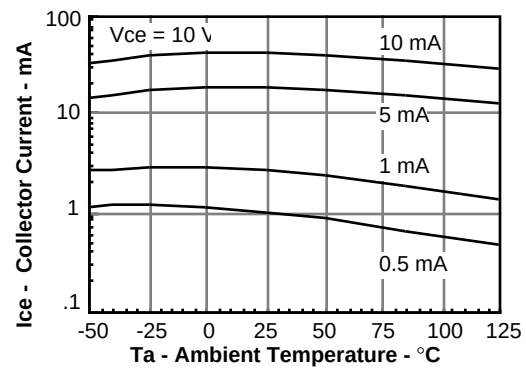


Figure 8. Collector-emitter current versus temperature and LED current

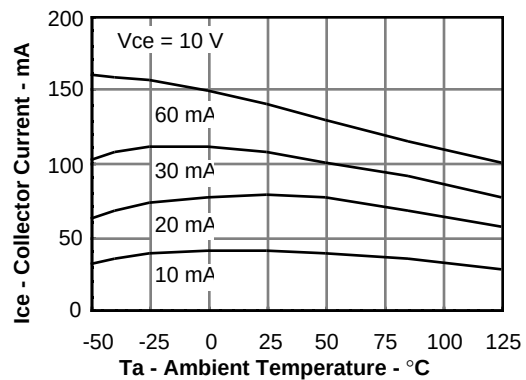


Figure 9. Saturated collector-emitter current versus temperature and LED current

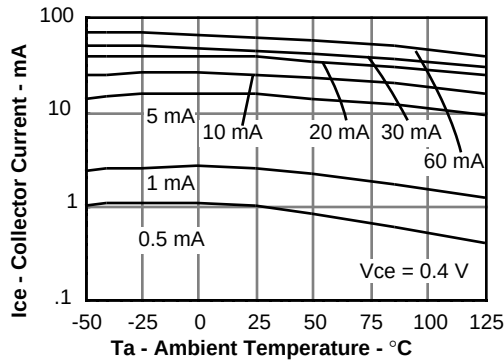


Figure 10. Saturated collector-emitter current versus temperature and LED current

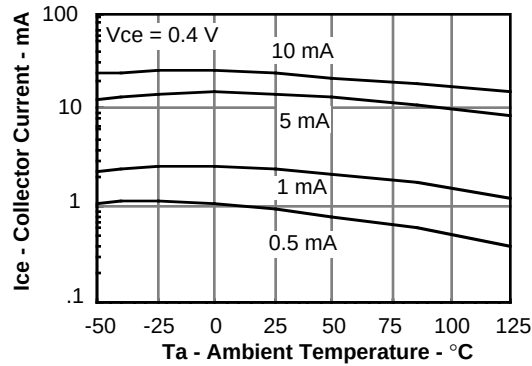


Figure 11. Collector-emitter leakage current versus temperature

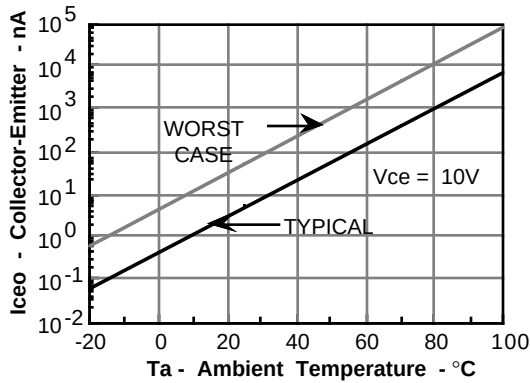


Figure 12. Propagation delay versus temperature and collector load resistance for If=5 mA

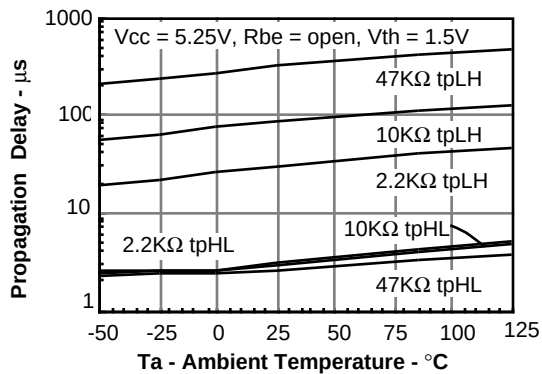


Figure 13. Propagation delay versus temperature and collector load resistance for If=10 mA

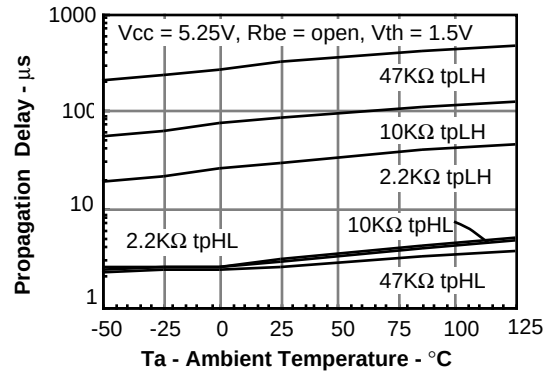


Figure 14. Propagation delay versus temperature and collector load resistance for If=20 mA

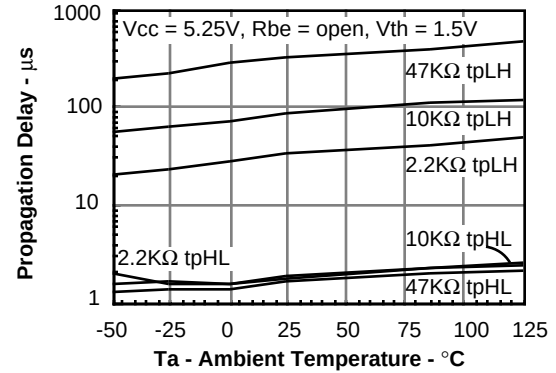


Figure 15. Common mode transient rejection

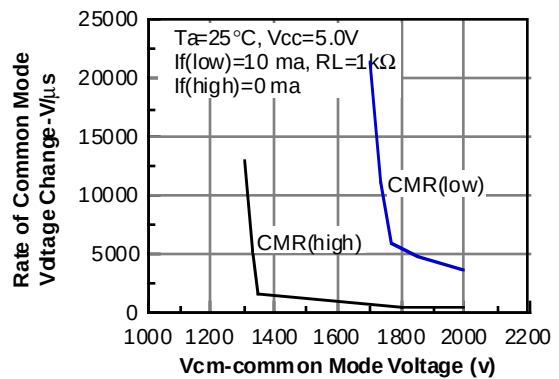


Figure 16. Saturated switching

