



ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)					
PARAMETER	TEST CONDITION	PART	SYMBOL	VALUE	UNIT
INPUT					
Reverse voltage			V_R	3	V
Supply and output voltage	V_{CC} (pin 8 to 5), V_O (pin 6 to 5)	SFH6318	V_{CC}, V_O	-0.5 to 7	V
		SFH6319	V_{CC}, V_O	-0.5 to 18	V
Input power dissipation			P_{diss}	35	mW
Average input current			$I_{F(AVG)}$	20	mA
Peak input current	50 % duty cycle; 1 ms pulse width		I_{FRM}	40	mA
Peak transient input current	$t_p \leq 1\text{ }\mu\text{s}$, 300 pps		I_{FSM}	1	A
OUTPUT					
Output current (pin 6)			I_O	60	mA
Emitter-base reverse current (pin 5 to 7)			V_{EB0}	0.5	V
Output power dissipation			P_{diss}	150	mW
Derate linearly from 25 $^{\circ}\text{C}$				2	mW/ $^{\circ}\text{C}$
COUPLER					
Storage temperature			T_{stg}	-55 to +125	$^{\circ}\text{C}$
Lead soldering temperature	$t = 10\text{ s}$		T_{slid}	260	$^{\circ}\text{C}$
Junction temperature			T_j	125	$^{\circ}\text{C}$
Ambient temperature range			T_{amb}	-55 to +100	$^{\circ}\text{C}$
Total power dissipation			P_{diss}	185	mW

Note

- 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.

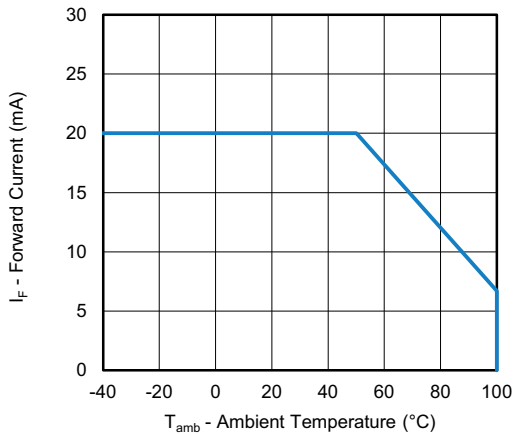


Fig. 1 - Forward Current vs. Ambient Temperature

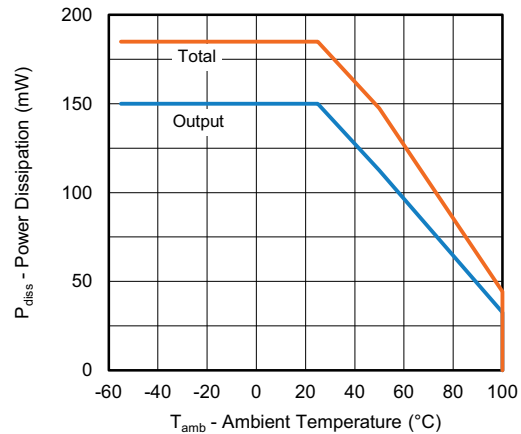


Fig. 2 - Power Dissipation vs. Ambient Temperature



ELECTRICAL CHARACTERISTICS ($T_{amb} = 0\text{ }^{\circ}\text{C}$ to $70\text{ }^{\circ}\text{C}$; typical values are at $T_{amb} = 25\text{ }^{\circ}\text{C}$)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT						
Forward voltage	$I_F = 1.6\text{ mA}$	V_F	-	1.28	1.7	V
Temperature coefficient of forward voltage	$I_F = 1.6\text{ mA}$	$\Delta V_F / \Delta T_{amb}$	-	-2.3	-	mV/ $^{\circ}\text{C}$
Input capacitance	$f = 1\text{ MHz}, V_F = 0$	C_{IN}	-	55	-	pF
OUTPUT						
Logic low output voltage ⁽¹⁾	$I_F = 1.6\text{ mA}, I_O = 4.8\text{ mA}, V_{CC} = 4.5\text{ V}$	V_{OL}	-	0.1	0.4	V
	$I_F = 1.6\text{ mA}, I_O = 8\text{ mA}, V_{CC} = 4.5\text{ V}$	V_{OL}	-	0.1	0.4	V
	$I_F = 5\text{ mA}, I_O = 15\text{ mA}, V_{CC} = 4.5\text{ V}$	V_{OL}	-	0.15	0.4	V
	$I_F = 12\text{ mA}, I_O = 24\text{ mA}, V_{CC} = 4.5\text{ V}$	V_{OL}	-	0.25	0.4	V
Logic high output current ⁽¹⁾	$I_F = 0\text{ mA}, V_O = V_{CC} = 7\text{ V}$	I_{IO}	-	0.1	250	μA
	$I_F = 0\text{ mA}, V_O = V_{CC} = 18\text{ V}$	I_{IO}	-	0.05	100	μA
Logic low supply current ⁽¹⁾	$I_F = 1.6\text{ mA}, V_O = \text{OPEN}, V_{CC} = 18\text{ V}$	I_{CCL}	-	0.3	1.5	mA
Logic high supply current ⁽¹⁾	$I_F = 0\text{ mA}, V_O = \text{OPEN}, V_{CC} = 18\text{ V}$	I_{CCH}	-	0.0003	10	μA
COUPLER						
Capacitance (input to output) ⁽²⁾	$f = 1\text{ MHz}$	C_{IO}	-	0.6	-	pF

Notes

- 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.

(1) Pin 7 open

(2) Device considered a two-terminal device: pins 1, 2, 3, and 4 shorted together and pins 5, 6, 7, and 8 shorted together

CURRENT TRANSFER RATIO ($T_{amb} = 0\text{ }^{\circ}\text{C}$ to $70\text{ }^{\circ}\text{C}$; typical values are at $T_{amb} = 25\text{ }^{\circ}\text{C}$)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Current transfer ratio ⁽¹⁾	$I_F = 1.6\text{ mA}, V_O = 0.4\text{ V}, V_{CC} = 4.5\text{ V}$	SFH6318	CTR	300	2000	2600	%
	$I_F = 0.5\text{ mA}, V_O = 0.4\text{ V}, V_{CC} = 4.5\text{ V}$	SFH6319	CTR	400	2200	3500	%
	$I_F = 1.6\text{ mA}, V_O = 0.4\text{ V}, V_{CC} = 4.5\text{ V}$	SFH6319	CTR	500	2000	2600	%

Notes

- DC current transfer ratio is defined as the ratio of output collector current, I_O , to the forward LED input current, I_F times 100 %

(1) Pin 7 open

SWITCHING CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Propagation delay time to low output level	$I_F = 1.6\text{ mA}, R_L = 2.2\text{ k}\Omega$	SFH6318	t_{PHL}	-	2	10	μs
Propagation delay time to low output level ⁽¹⁾⁽²⁾	$I_F = 0.5\text{ mA}, R_L = 4.7\text{ k}\Omega$	SFH6319	t_{PHL}	-	4	25	μs
Propagation delay time to high output level ⁽¹⁾⁽²⁾	$I_F = 12\text{ mA}, R_L = 270\text{ }\Omega$	SFH6319	t_{PHL}	-	0.5	1	μs
Propagation delay time to high output level	$I_F = 1.6\text{ mA}, R_L = 2.2\text{ k}\Omega$	SFH6318	t_{PLH}	-	15	35	μs
Propagation delay time to high output level ⁽¹⁾⁽²⁾	$I_F = 0.5\text{ mA}, R_L = 4.7\text{ k}\Omega$	SFH6319	t_{PLH}	-	30	60	μs
Propagation delay time to high output level ⁽¹⁾⁽²⁾	$I_F = 12\text{ mA}, R_L = 270\text{ }\Omega$	SFH6319	t_{PLH}	-	3	7	μs

Notes

(1) Pin 7 open

(2) Using a resistor between pin 5 and 7 will decrease gain and delay time



SAFETY AND INSULATION RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Climatic classification	According to IEC 68 part 1		55 / 100 / 21	
Pollution degree	According to DIN VDE 0109		2	
Comparative tracking index	Insulation group IIIa	CTI	175	
Maximum rated withstanding isolation voltage	According to UL1577, $t = 1\text{ min}$	V_{ISO}	3333	V_{RMS}
Tested withstanding isolation voltage	According to UL1577, $t = 1\text{ s}$	V_{ISO}	4000	V_{RMS}
Maximum transient isolation voltage	According to DIN EN 60747-5-5	V_{IOTM}	6000	V_{peak}
Maximum repetitive peak isolation voltage	According to DIN EN 60747-5-5	V_{IORM}	560	V_{peak}
Isolation resistance	$V_{IO} = 500\text{ V}$, $T_{amb} = 25\text{ }^{\circ}\text{C}$	R_{IO}	$\geq 10^{12}$	Ω
	$V_{IO} = 500\text{ V}$, $T_{amb} = 100\text{ }^{\circ}\text{C}$	R_{IO}	$\geq 10^{11}$	Ω
	$V_{IO} = 500\text{ V}$, $T_{amb} = T_s$	R_{IO}	$\geq 10^9$	Ω
Output safety power		P_{SO}	350	mW
Input safety current		I_{SI}	150	mA
Safety temperature		T_s	165	$^{\circ}\text{C}$
Creepage distance			≥ 4	mm
Clearance distance			≥ 4	mm
Insulation thickness		DTI	≥ 0.3	mm
Input to output test voltage, method B	$V_{IORM} \times 1.875 = V_{PR}$, 100 % production test with $t_M = 1\text{ s}$, partial discharge $< 5\text{ pC}$	V_{PR}	1050	V_{peak}
Input to output test voltage, method A	$V_{IORM} \times 1.6 = V_{PR}$, 100 % sample test with $t_M = 10\text{ s}$, partial discharge $< 5\text{ pC}$	V_{PR}	896	V_{peak}

Note

- As per IEC 60747-5-5, § 7.4.3.8.2, this optocoupler is suitable for “safe electrical insulation” only within the safety ratings. Compliance with the safety ratings shall be ensured by means of protective circuits.

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

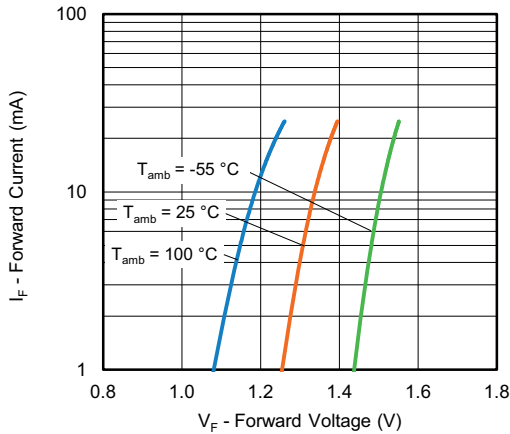


Fig. 5 - Forward Current vs. Forward Voltage

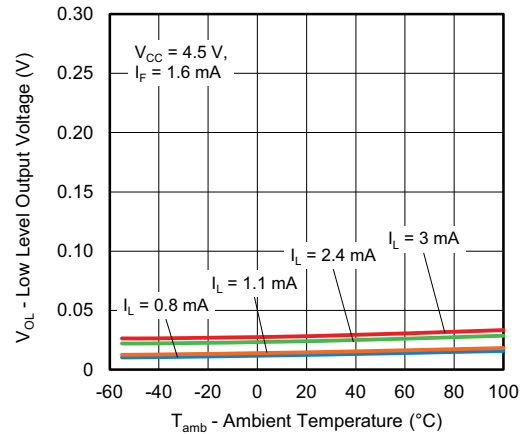


Fig. 8 - Low Level Output Voltage vs. Ambient Temperature

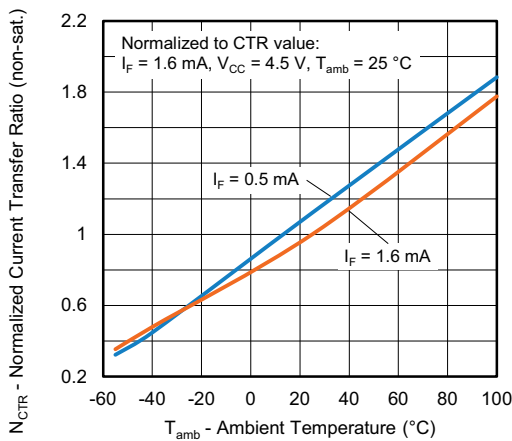


Fig. 6 - Normalized Current Transfer Ratio (non-saturated) vs. Ambient Temperature

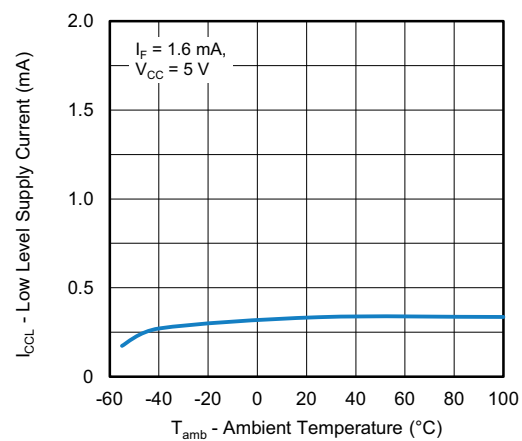


Fig. 9 - Low Level Supply Current vs. Ambient Temperature

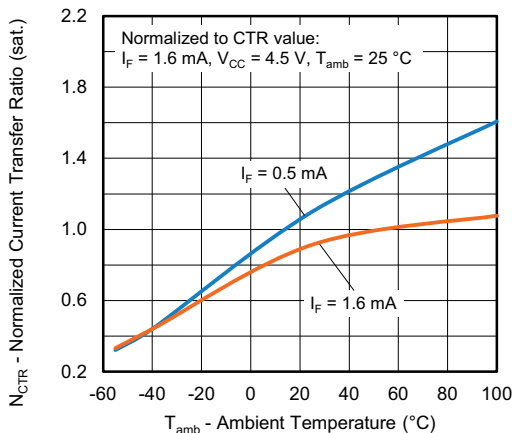


Fig. 7 - Normalized Current Transfer Ratio (saturated) vs. Ambient Temperature

PACKAGE DIMENSIONS (in millimeters)

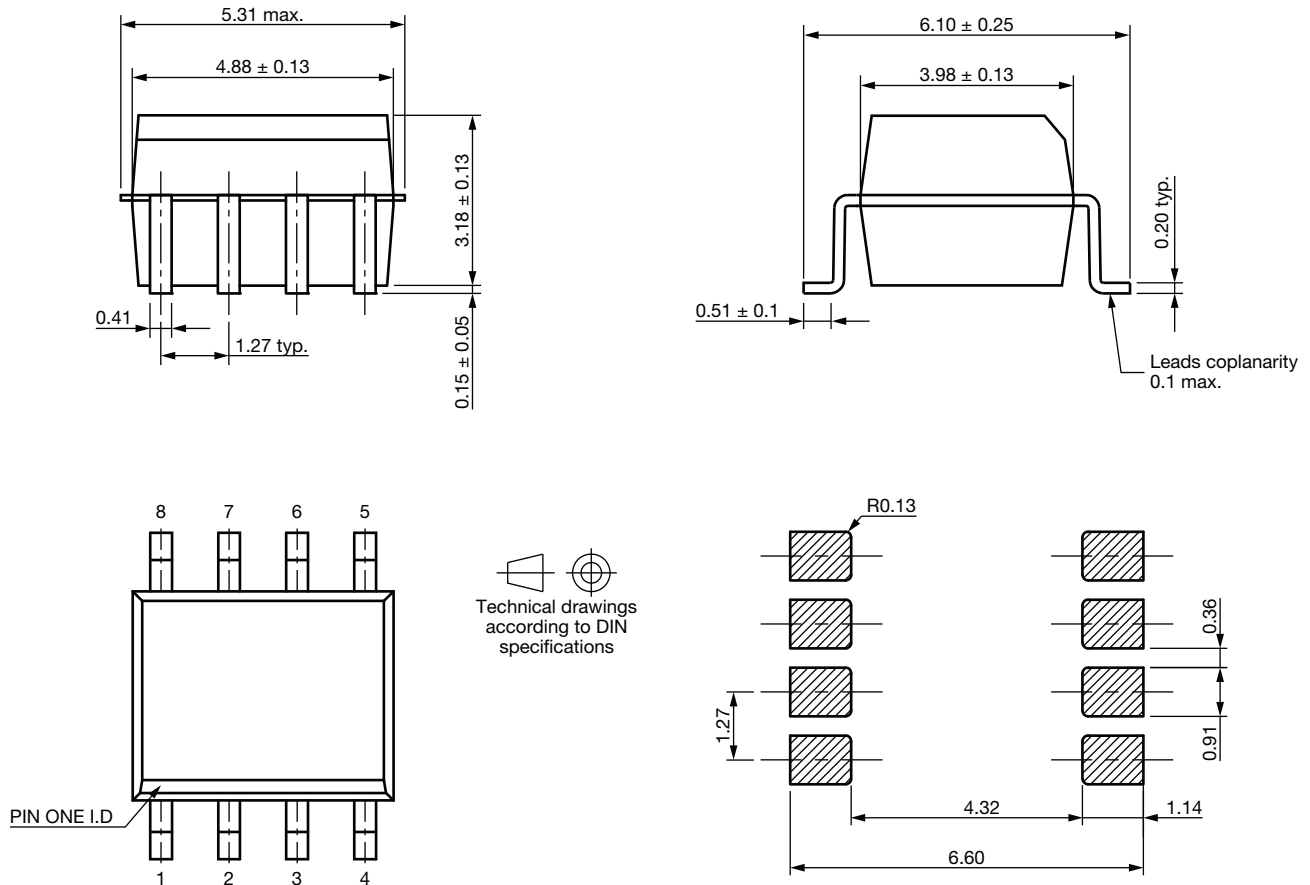


Fig. 10 - Package Drawing

PACKAGE MARKING

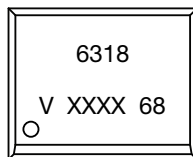


Fig. 11 - Example of SFH6318

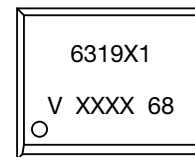


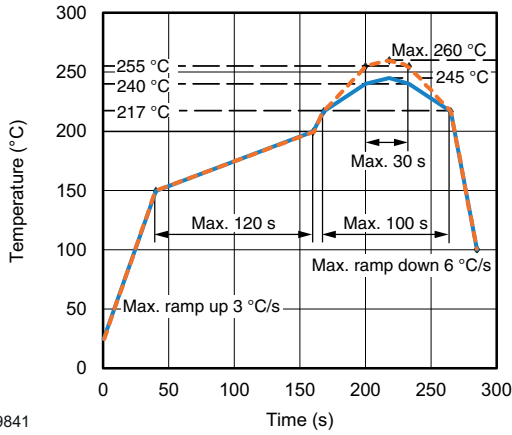
Fig. 12 - Example of SFH6319-X001T

Notes

- XXXX = LMC (lot marking code)
- "X1" is only marked on option 1 parts
- Tape and reel suffix (T) is not part of the package marking



SOLDER PROFILE



19841

Fig. 15 - Lead (Pb)-free Reflow Solder Profile according to J-STD-020

HANDLING AND STORAGE CONDITIONS

ESD level: HBM class 2

Floor life: unlimited

Conditions: $T_{amb} < 30\text{ °C}$, RH < 85 %

Moisture sensitivity level 1, according to J-STD-020



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