


PRODUCTION DATA DOCUMENTS CONTAIN INFORMATION

TIL113, TIL119A OPTOCOUPERS

electrical characteristics at 25°C free-air temperature

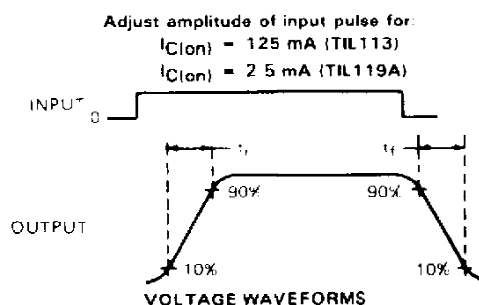
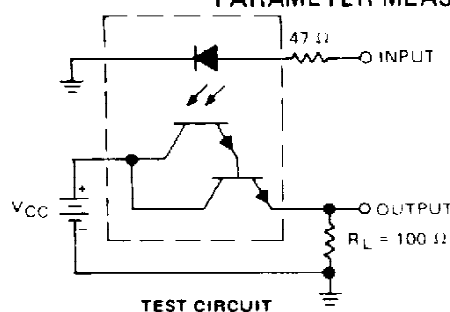
PARAMETER	TEST CONDITIONS†	TIL113			TIL119A			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
$V_{(BR)CBO}$ Collector-Base Breakdown Voltage	$I_C = 10 \mu A$, $I_E = 0$, $I_F = 0$	30						V
$V_{(BR)CEO}$ Collector-Emitter Breakdown Voltage	$I_C = 1 \text{ mA}$, $I_B = 0$, $I_F = 0$	30			30			V
$V_{(BR)EBO}$ Emitter-Base Breakdown Voltage	$I_E = 10 \mu A$, $I_C = 0$, $I_F = 0$	7						V
$V_{(BR)ECO}$ Emitter-Collector Breakdown Voltage	$I_E = 10 \mu A$, $I_F = 0$				7			V
$I_{C(on)}$ On State Collector Current	$V_{CE} = 1 \text{ V}$, $I_B = 0$, $I_F = 10 \text{ mA}$	30	100					mA
	$V_{CE} = 1 \text{ V}$, $I_F = 10 \text{ mA}$				30	160		
$I_{C(off)}$ Off-State Collector Current	$V_{CE} = 10 \text{ V}$, $I_B = 0$, $I_F = 0$			100			100	nA
β_{FE} Transistor Static Forward Current Transfer Ratio	$V_{CE} = 1 \text{ V}$, $I_C = 10 \text{ mA}$, $I_F = 0$		15,000					
V_F Input Diode Static Forward Voltage	$I_F = 10 \text{ mA}$			1.5			1.5	V
$V_{CE(sat)}$ Collector-Emitter Saturation Voltage	$I_C = 125 \text{ mA}$, $I_B = 0$, $I_F = 50 \text{ mA}$			1.2				V
	$I_C = 30 \text{ mA}$, $I_F = 10 \text{ mA}$						1	
r_{IO} Input-to-Output Internal Resistance	$V_{in-out} = \pm 1.5 \text{ kV}$. See Note 6	10 ¹¹			10 ¹¹			Ω
C_{io} Input-to-Output Capacitance	$V_{in-out} = 0$, $f = 1 \text{ MHz}$. See Note 6		1	1.3		1	1.3	pF

NOTE 6: These parameters are measured between both input-diode leads shorted together and all the phototransistor leads shorted together. *Reference to the base are not applicable to TIL119A.

switching characteristics at 25°C free-air temperature

PARAMETER	TEST CONDITIONS	TIL113			TIL119A			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
t_r Rise Time	$V_{CC} = 15 \text{ V}$, $I_{C(on)} = 125 \text{ mA}$, $R_L = 100 \Omega$, See Figure 1		300					μs
t_f Fall Time			300					
t_r Rise Time	$V_{CC} = 10 \text{ V}$, $I_{C(on)} = 2.5 \text{ mA}$, $R_L = 100 \Omega$, See Figure 1					300		μs
t_f Fall Time						300		

PARAMETER MEASUREMENT INFORMATION



- NOTES: a. The input waveform is supplied by a generator with the following characteristics: $Z_{out} = 50 \Omega$, $t_r = 15 \text{ ns}$, duty cycle = 1%, $t_w = 500 \mu s$.
b. The output waveform is monitored on an oscilloscope with the following characteristics: $t_r = 12 \text{ ns}$, $R_{in} = 1 \text{ M}\Omega$, $C_{in} = 20 \text{ pF}$.

FIGURE 1—SWITCHING TIMES

TYPICAL CHARACTERISTICS

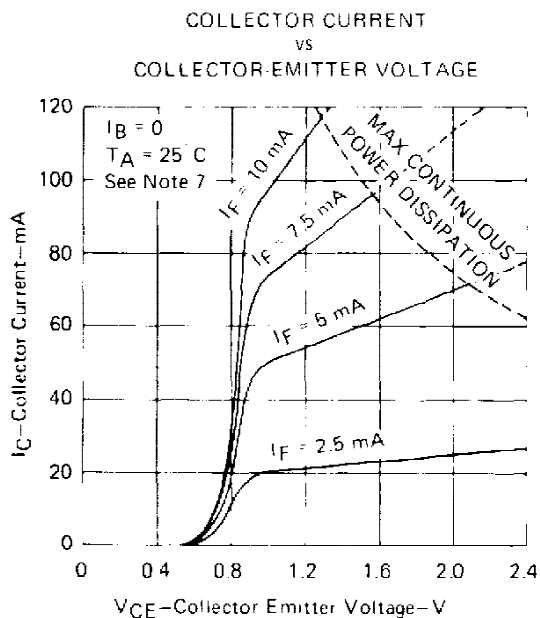


FIGURE 2

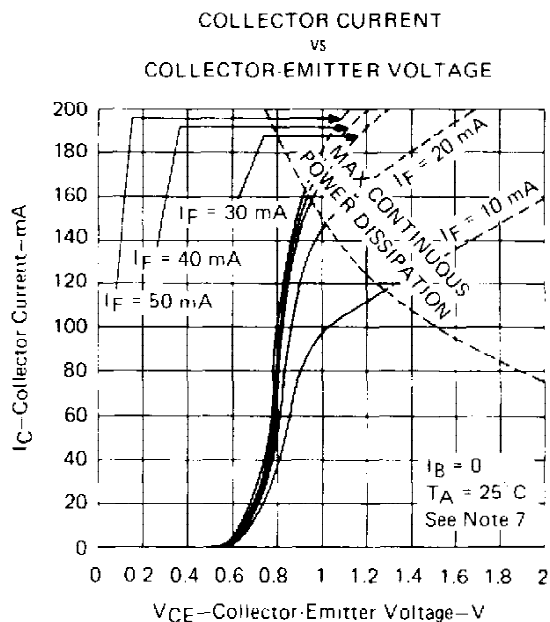


FIGURE 3

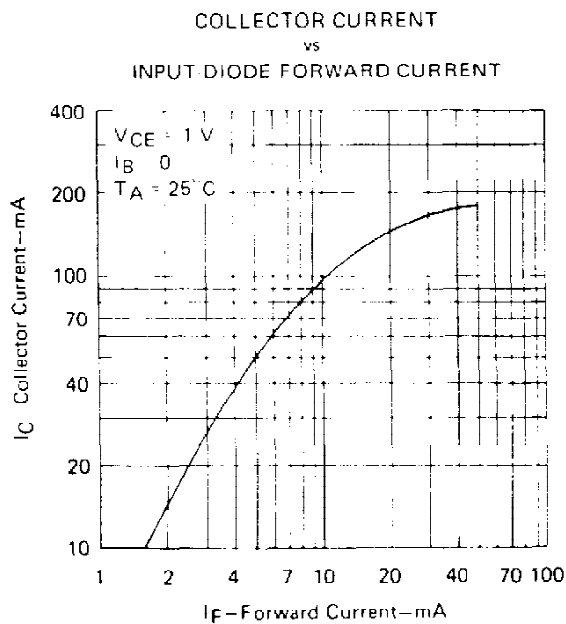


FIGURE 4

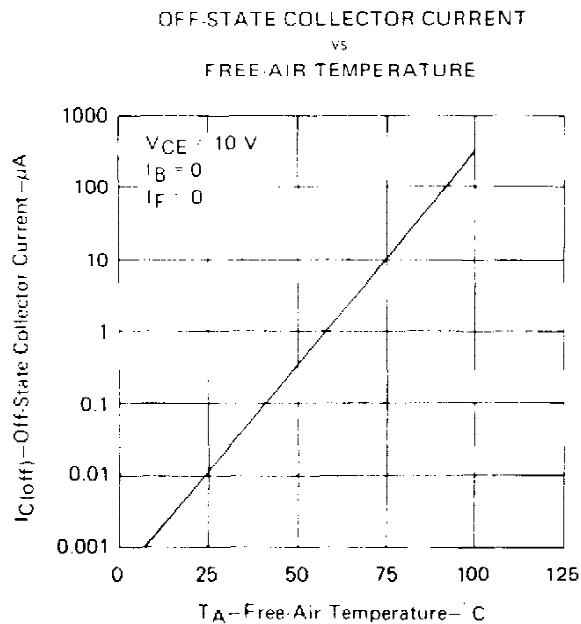


FIGURE 5

NOTE 7. Pulse operation of input diode is required for operation beyond limits shown by dotted line.

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TYPICAL CHARACTERISTICS

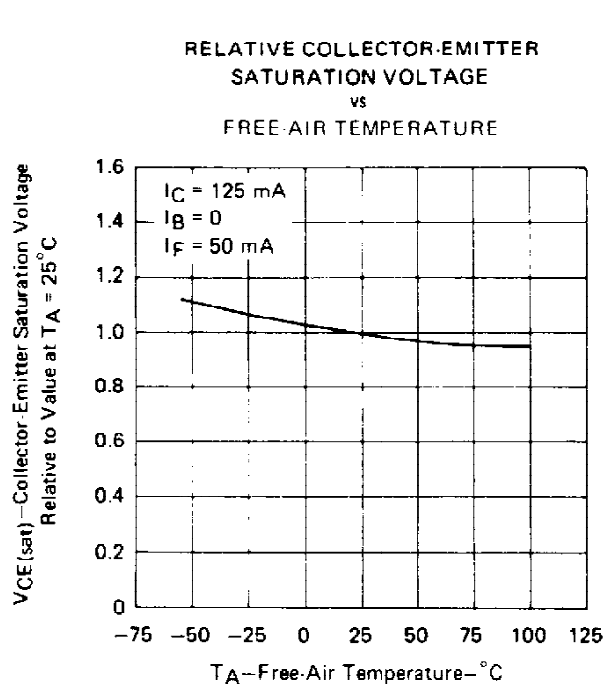


FIGURE 6

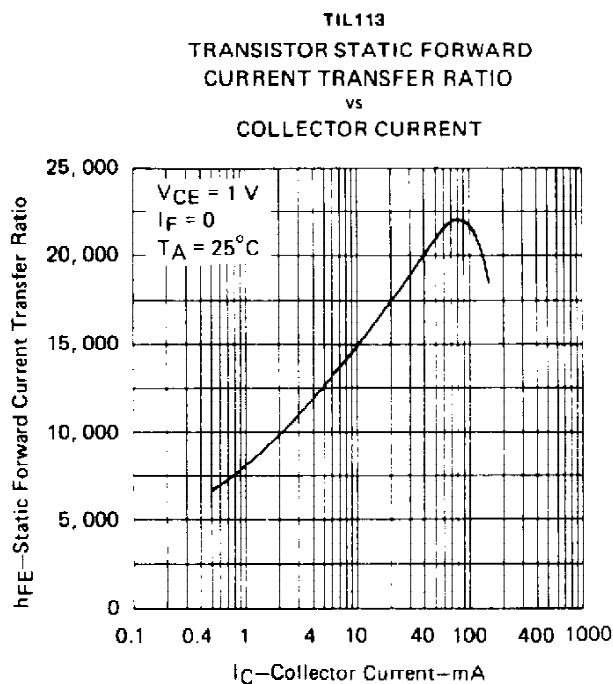


FIGURE 7

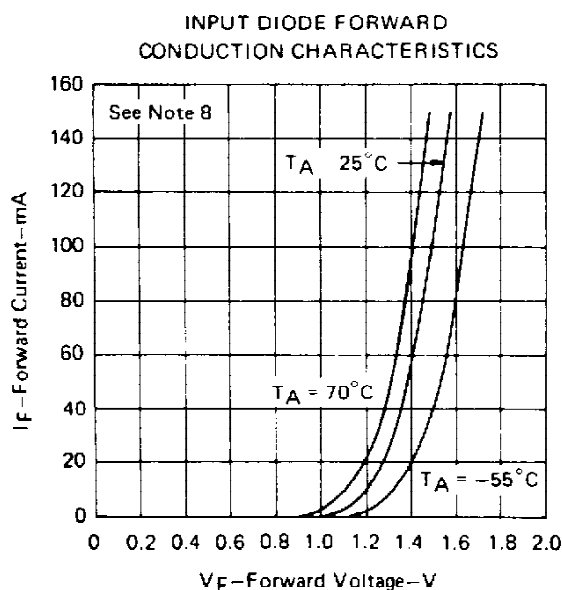


FIGURE 8

NOTE 8: This parameter was measured using pulse techniques. $t_w = 1\text{ ms}$, duty cycle $\leq 2\%$.

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