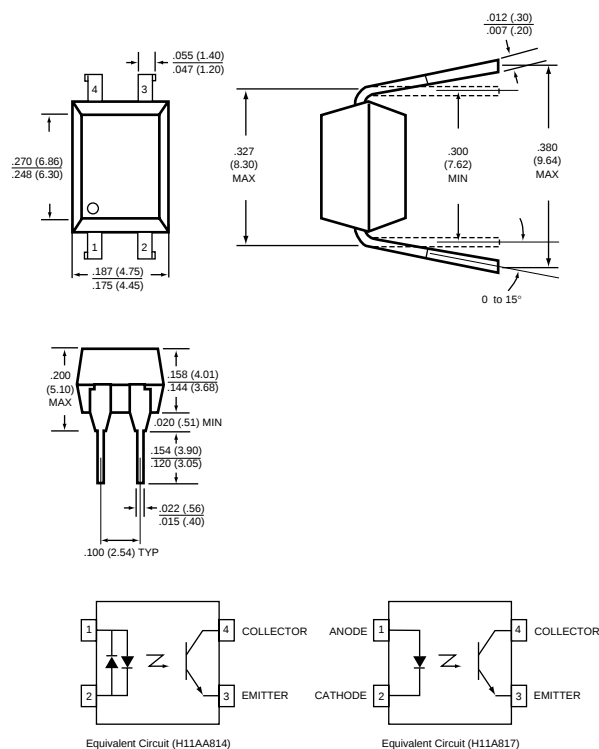


### PACKAGE DIMENSIONS



NOTE: ALL DIMENSIONS ARE IN INCHES (mm)  
PACKAGE CODE T

### DESCRIPTION

The QT Optoelectronics H11AA814 Series consists of two gallium arsenide infrared emitting diodes, connected in inverse parallel, driving a single silicon phototransistor in a 4-pin dual in-line package.

The H11A817 Series consists of a gallium arsenide infrared emitting diode driving a silicon phototransistor in a 4-pin dual in-line package.

### FEATURES

- Compact 4-pin package
- Current transfer ratio in selected groups:
 

|                    |                    |
|--------------------|--------------------|
| H11AA814: 20-300%  | H11A817: 50-600%   |
| H11AA814A: 50-150% | H11A817A: 80-160%  |
|                    | H11A817B: 130-260% |
|                    | H11A817C: 200-400% |
|                    | H11A817D: 300-600% |

### APPLICATIONS

#### H11AA814 Series

- AC line monitor
- Unknown polarity DC sensor
- Telephone line interface

#### H11A817 Series

- Power supply regulators
- Digital logic inputs
- Microprocessor inputs
- Industrial controls

### ABSOLUTE MAXIMUM RATING

#### TOTAL PACKAGE

Storage temperature . . . . . -55° to 150° C  
 Operating temperature . . . . . -55° to 100° C  
 Lead solder temperature . . . . . 260° C for 10 sec  
 Power dissipation . . . . . 200 mW

#### INPUT DIODE

Power dissipation (25° C ambient) . . . . . 70 mW  
 Derate linearly (above 25° C) . . . . . 1.33 mW/° C  
 Continuous forward current . . . . . 50 mA  
 Peak forward current (1 μs pulse, 300 pps) . . . . . 1 A  
 Reverse voltage (H11A817) . . . . . 5 V

#### OUTPUT TRANSISTOR

Power dissipation (25° C ambient) . . . . . 150 mW  
 Derate linearly (above 25° C) . . . . . 2.0 mW/° C  
 $V_{CEO}$  . . . . . 35 V  
 $V_{ECO}$  . . . . . 6 V  
 Continuous collector current . . . . . 50 mA

**ELECTRO-OPTICAL CHARACTERISTICS ( $T_A = 25^\circ \text{C}$  Unless otherwise specified)**

**INDIVIDUAL COMPONENT CHARACTERISTICS (Applies to all unless indicated otherwise)**

| PARAMETER                | SYMBOL     | MIN | TYP  | MAX | UNITS         | TEST CONDITIONS                           |
|--------------------------|------------|-----|------|-----|---------------|-------------------------------------------|
| <b>INPUT DIODE</b>       |            |     |      |     |               |                                           |
| Forward voltage          |            |     |      |     |               |                                           |
| H11A817                  | $V_F$      |     | 1.2  | 1.5 | V             | $I_F = 20 \text{ mA}$                     |
| H11AA814                 | $V_F$      |     | 1.2  | 1.5 | V             | $I_F = \pm 20 \text{ mA}$                 |
| Reverse current          |            |     |      |     |               |                                           |
| H11A817                  | $I_R$      |     | .001 | 10  | $\mu\text{A}$ | $V_R = 5 \text{ V}$                       |
| <b>OUTPUT TRANSISTOR</b> |            |     |      |     |               |                                           |
| Breakdown voltage        |            |     |      |     |               |                                           |
| Collector to emitter     | $BV_{CEO}$ | 35  | 100  |     | V             | $I_C = 1 \text{ mA}, I_F = 0$             |
| Emitter to collector     | $BV_{ECO}$ | 6   | 10   |     | V             | $I_E = 100 \mu\text{A}, I_F = 0$          |
| Collector dark current   | $I_{CEO}$  |     | .025 | 100 | nA            | $V_{CE} = 10 \text{ V}, I_F = 0$          |
| Capacitance              | $C_{CE}$   |     | 8    |     | pF            | $V_{CE} = 0 \text{ V}, f = 1 \text{ MHz}$ |

**TRANSFER CHARACTERISTICS**

| CHARACTERISTIC            | SYMBOL        | MIN | TYP | MAX | UNITS         | TEST CONDITIONS                                              |
|---------------------------|---------------|-----|-----|-----|---------------|--------------------------------------------------------------|
| DC current transfer ratio |               |     |     |     |               |                                                              |
| H11AA814                  | CTR           | 20  |     | 300 | %             | $I_F = \pm 1 \text{ mA}, V_{CE} = 5 \text{ V}$               |
| H11AA814A                 | CTR           | 50  |     | 150 | %             | $I_F = \pm 1 \text{ mA}, V_{CE} = 5 \text{ V}$               |
| H11A817                   | CTR           | 50  |     | 600 | %             | $I_F = 5 \text{ mA}, V_{CE} = 5 \text{ V}$                   |
| H11A817A                  | CTR           | 80  |     | 160 | %             |                                                              |
| H11A817B                  | CTR           | 130 |     | 260 | %             |                                                              |
| H11A817C                  | CTR           | 200 |     | 400 | %             |                                                              |
| H11A817D                  | CTR           | 300 |     | 600 | %             |                                                              |
| Saturation Voltage        | $V_{CE(SAT)}$ |     | 0.1 | 0.2 | V             | $I_F = (\pm) 20 \text{ mA}, I_C = 1 \text{ mA}$              |
| Rise time (non saturated) | $t_r$         |     | 2.4 | 18  | $\mu\text{s}$ | $I_C = 2 \text{ mA}, V_{CE} = 2 \text{ V}, R_L = 100 \Omega$ |
| Fall time (non saturated) | $t_f$         |     | 2.4 | 18  | $\mu\text{s}$ | $I_C = 2 \text{ mA}, V_{CE} = 2 \text{ V}, R_L = 100 \Omega$ |

**ISOLATION CHARACTERISTICS**

| CHARACTERISTIC                 | SYMBOL    | MIN       | TYP | MAX | UNITS     | TEST CONDITIONS                          |
|--------------------------------|-----------|-----------|-----|-----|-----------|------------------------------------------|
| Steady-state isolation voltage | $V_{ISO}$ | 5300      |     |     | $V_{RMS}$ | 1 Minute                                 |
| Isolation resistance           | $R_{ISO}$ | $10^{11}$ |     |     | $\Omega$  | $V_{I-O} = 500 \text{ VDC}$              |
| Isolation capacitance          | $C_{ISO}$ |           | 0.5 |     | pF        | $V_{I-O} = \emptyset, f = 1 \text{ MHz}$ |

TYPICAL CHARACTERISTICS

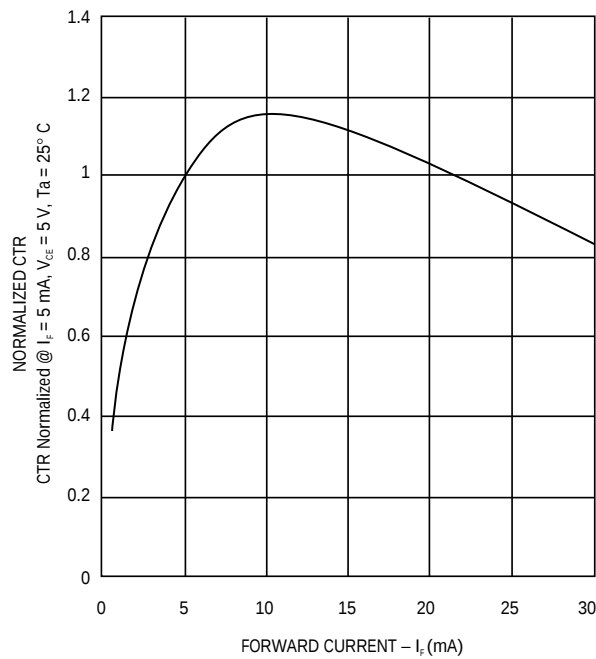


FIG. 1 - Normalized CTR vs. Forward Current

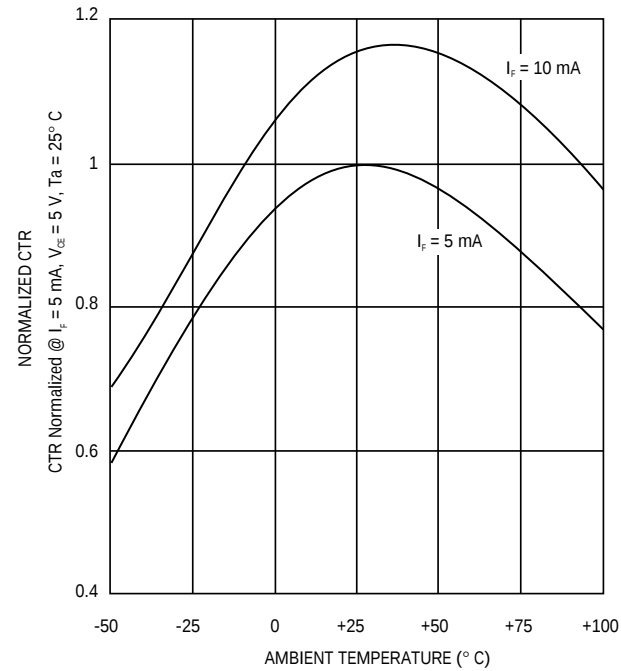


FIG. 2 - Normalized CTR vs. Ambient Temperature

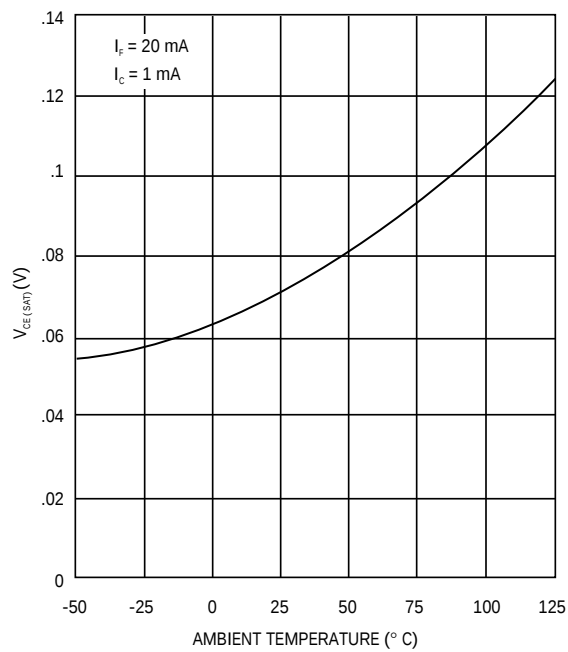


FIG. 3 -  $V_{CE(SAT)}$  vs. Ambient Temperature

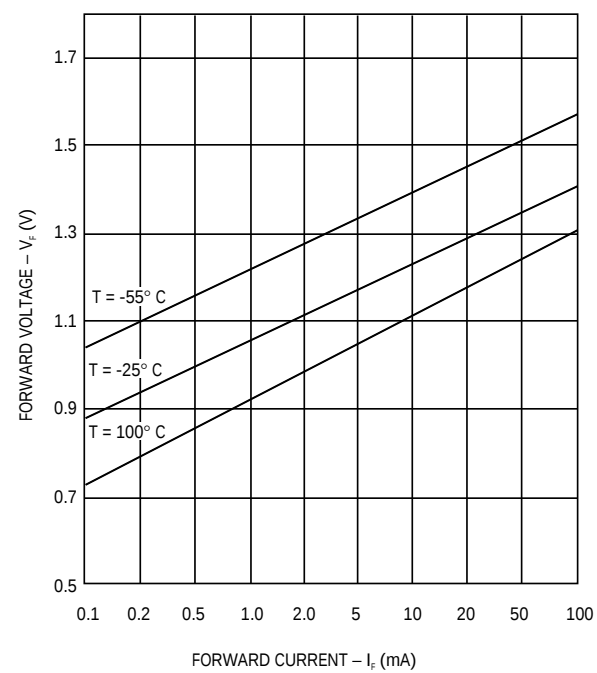


FIG. 4 - Forward Voltage vs. Forward Current

TYPICAL CHARACTERISTICS

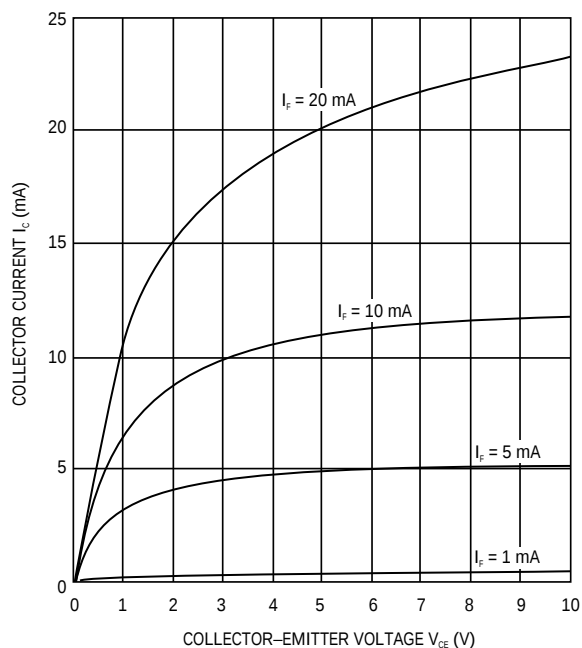


FIG. 5 - Collector Current vs. Collector-Emitter Voltage

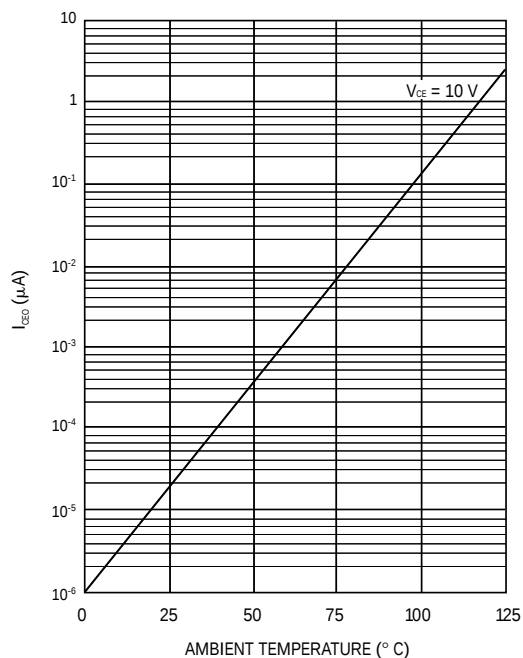


FIG. 6 - Collector Leakage Current vs. Ambient Temperature

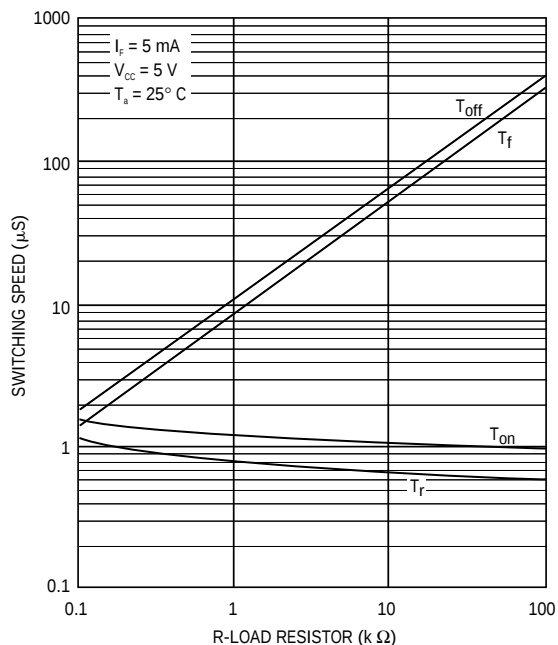


FIG. 7 - Switching Speed vs. Load Resistor (TYP)

Call QT Optoelectronics for more information or the phone number of your nearest distributor.

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