

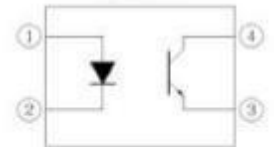
● Features

- 1.Current conversion ratio (CTR : MIN. 50% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$, $T_a = 25^\circ\text{C}$)
- 2.Insulation voltage: ($V_{ISO} = 5,000\text{V}_{rms}$)
- 3.High collector emitter voltage ($V_{CEO} = 70\text{V}$)
- 4.Temperature range: -55°C to 110°C
- 5.Long creepage distance: $> 8\text{mm}$, Lead-free, RoHS compliant
- 6.CQC approved(No. 15801-CQC001041-201800042)
- 7.VDE approved(No.40029733)



SMD-4

Schematic



Pin configuration
 1.Anode
 2.Cathode
 3.Emitter
 4.Collector

● Illustrate

The SL-10XX series devices contain an infrared emitting diode, photo transistor detector. They are halogen and Sb₂O₃ free. They are packaged in a 4-pin SOP.

● Application Range

- Programmable Controller
- System devices, measuring instruments
- Telecommunication equipment
- Household appliances, such as fans and heaters
- Signal transmission between circuits of different potentials and impedance

● Max Absolute rated Value (Normal Temperature=25°C)

| Parameter | | Symbol | Rated Value | Unit |
|--------------------------|-------------------------------|-----------|--------------|------------------|
| Input | Forward Current | I_F | 60 | mA |
| | Junction Temperature | T_J | 125 | $^\circ\text{C}$ |
| | Reverse Voltage | V_R | 6 | V |
| | Consume Power | P | 100 | mW |
| Output | Collector and emitter Voltage | V_{CEO} | 80 | V |
| | Emitter and collector Voltage | V_{ECO} | 7 | |
| | Collector Current | I_C | 50 | mA |
| | Consume Power | P_C | 150 | mW |
| Total Consume Power | | P_{tot} | 250 | mW |
| *1 Insulation Voltage | | V_{iso} | 5000 | V _{rms} |
| Working Temperature | | T_{opr} | -30 to + 110 | $^\circ\text{C}$ |
| Deposit Temperature | | T_{stg} | -55 to + 125 | |
| *2 Soldering Temperature | | T_{sol} | 260 | |

*1. AC testing, time 1 minute, humidity =40~60% AC Test, 1 minute, humidity = 40~60% Insulation test method as below:

- (1)Short circuit both terminals of photocoupler
- (2)No Current when testing insulation voltage
- (3)Adding sine wave voltage when testing

*2. Soldering time is 10 seconds

• Opto-electronic Characteristics

| Parameter | | Symbol | Condition | Min | Typ.* | Max | Unit |
|------------------------------|---|---------------|---|---------|---------|-----|---------------|
| Input | Forward Current | V_F | $I_F=50\text{mA}$ | --- | 1.25 | 1.5 | V |
| | Reverse Voltage | I_R | $V_R=6\text{V}$ | --- | --- | 10 | μA |
| | Collector capacitance | C_t | $V=0, f=1\text{KHz}$ | --- | 50 | --- | pF |
| Output | Collector to emitter Current | I_{CEO} | $V_{CE}=20\text{V}, I_F=0$ | --- | --- | 100 | nA |
| | Collector and Emitter attenuation Voltage | BV_{CEO} | $I_C=0.1\text{mA}, I_F=0$ | 80 | --- | --- | V |
| | Emitter and Collector attenuation Voltage | BV_{ECO} | $I_E=0.1\text{mA}, I_F=0$ | 7 | --- | --- | V |
| Transforming Characteristics | *1 Current conversion ratio | C_{TR} | $I_F=5\text{mA}, V_{CE}=5\text{V}$ | 50 | --- | 600 | % |
| | Collector Current | I_C | | 2.5 | --- | 30 | mA |
| | Collector and Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_F=10\text{mA}, I_C=1\text{mA}$ | --- | --- | 0.3 | V |
| | Insulation Impedance | R_{iso} | DC500V 40~60%R.H. | 10 5x10 | 11 1x10 | --- | Ω |
| | Floating Capacitance | C_f | $V=0, f=1\text{MHz}$ | --- | 0.6 | 1 | pF |
| | Response Time | t_r | $V_{CC}=2\text{V}, I_C=2\text{mA}, R_L=100\Omega$ | --- | --- | 18 | μs |
| | Descend Time | t_f | | --- | --- | 18 | μs |

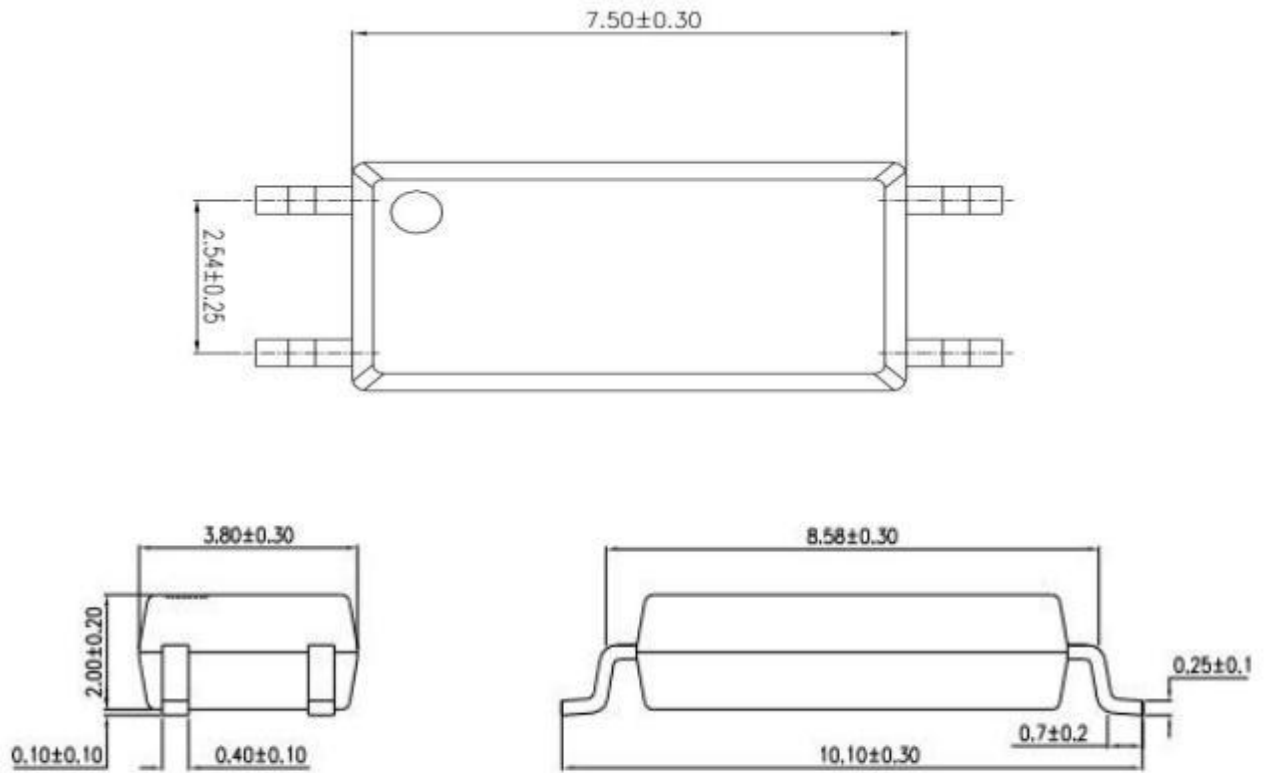
• Current Conversion Ratio = $I_C / I_F \times 100\%$

- Rank table of current transfer ratio CTR

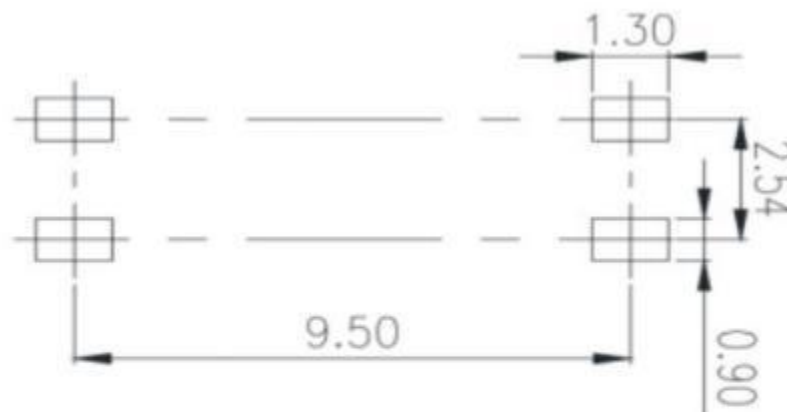
| CTR Rank | Min. | Typ. | Max. | Unit | Condition |
|----------|------|------|------|------|-------------------------|
| SL-1000 | 50 | — | 600 | % | IF=5mA, VCE=5V, Ta=25°C |
| SL-1001 | 100 | — | 160 | | |
| SL-1004 | 100 | — | 200 | | |
| SL-1005 | 50 | — | 150 | | |
| SL-1006 | 100 | — | 300 | | |
| SL-1007 | 80 | — | 160 | | |
| SL-1008 | 130 | — | 260 | | |
| SL-1009 | 200 | — | 400 | | |
| SL-1010 | 150 | — | 300 | | |
| SL-1019 | 250 | — | 500 | | |
| SL-1020 | 300 | — | 450 | | |
| SL-1002 | 22 | — | — | | |
| SL-1003 | 34 | — | — | | |
| SL-1014 | 56 | — | — | | |
| SL-1015 | 63 | — | 125 | | |
| SL-1018 | 100 | — | 200 | | |
| SL-1002 | 63 | — | 125 | % | |
| SL-1003 | 100 | — | 200 | | |

• Outer Dimension

SMD-4



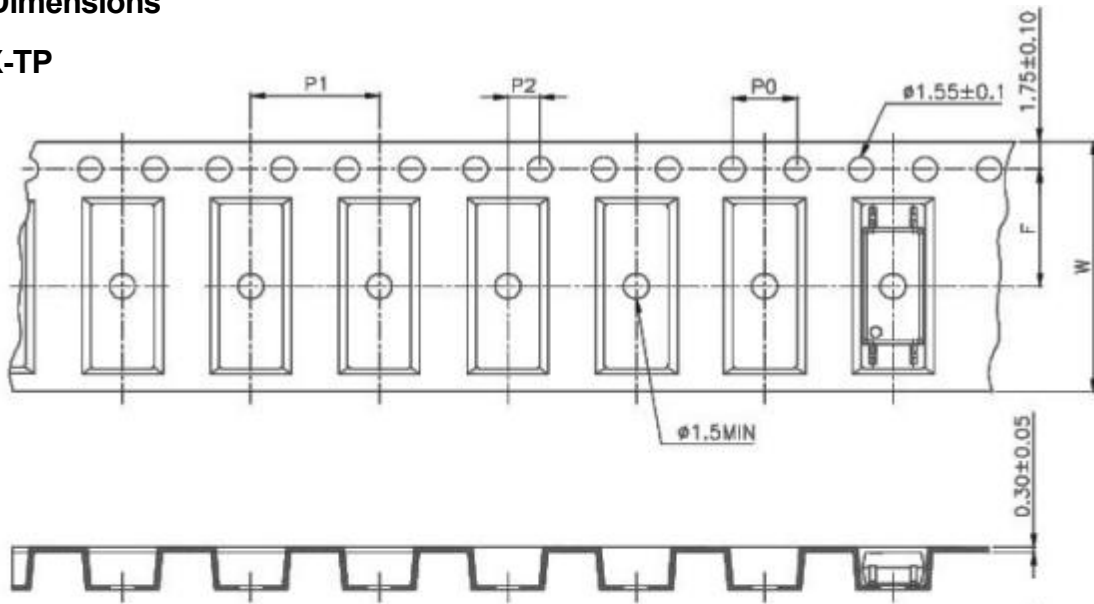
• Recommended Foot Print Patterns (Mount Pad)



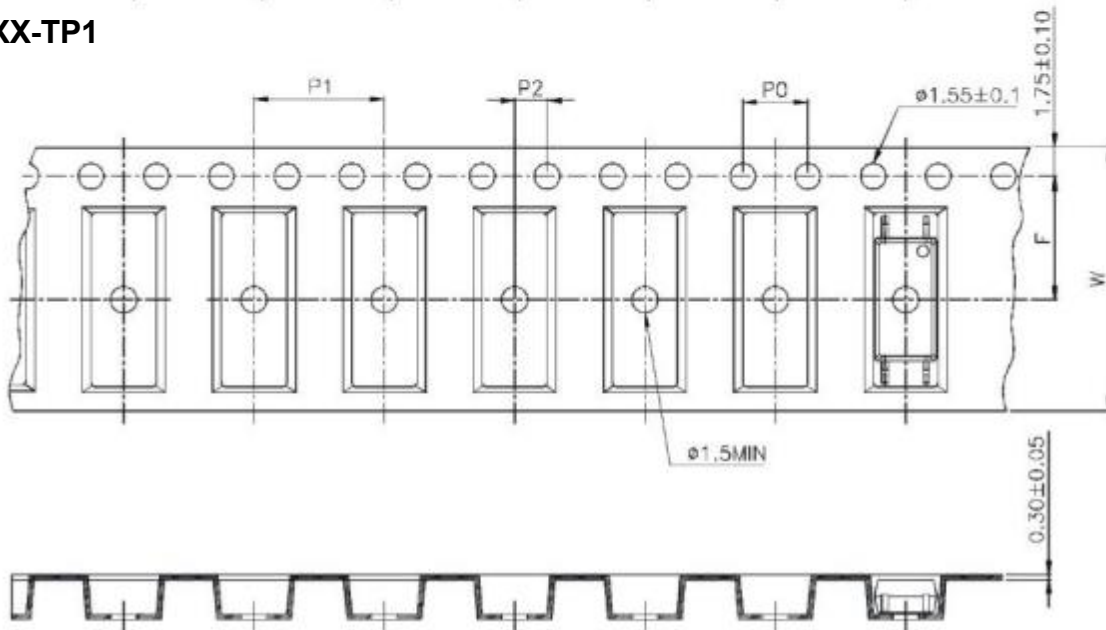
Unit: MM

• Taping Dimensions

1. SL-10XX-TP



2. SL-10XX-TP1



| Type | Symbol | Dimensions: mm (inches) |
|---------------|--------|-------------------------|
| Bandwidth | W | 16±0.3(.63) |
| Hole distance | P0 | 4±0.3(.63) |
| Hole distance | F | 7.5±0.1(.295) |
| | P2 | 2±0.1(.079) |
| Interval | P1 | 8±0.1(.315) |

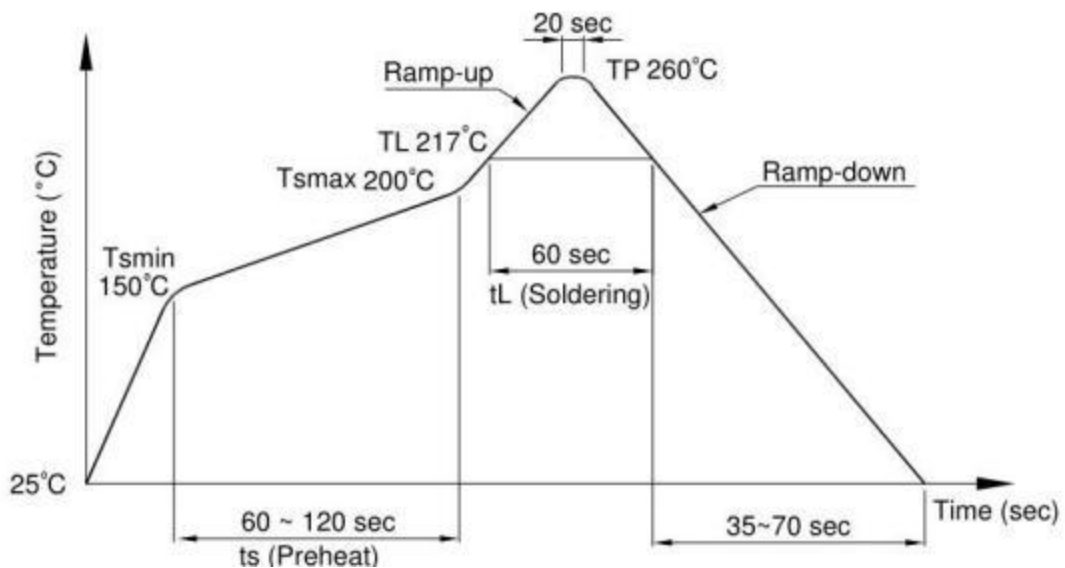
| | |
|---------|----------------|
| Package | SL-10XX series |
| Amount | 3000 |

• Temperature Profile Of Soldering

1. Infrared reflow (jedec-std-020c compatible) (IR Reflow soldering (JEDEC-STD-020C compliant))

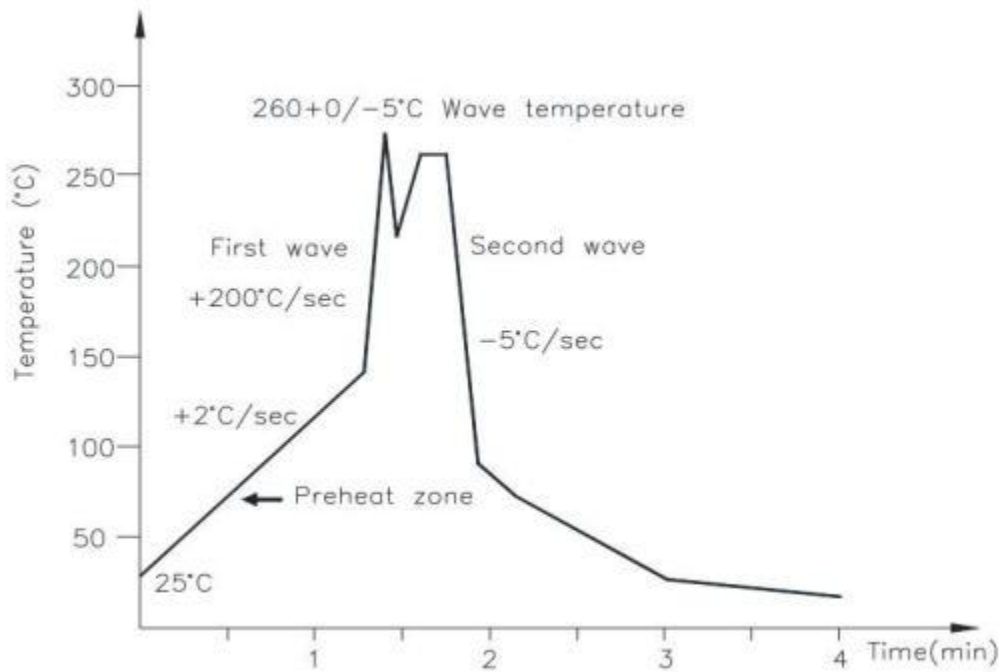
Notice: Reflow soldering is recommended under the temperature and time profiles as shown. Do not solder more than three times.

| Configuration | Condition |
|---|-----------------------------|
| Preheat - T _{Smin} - T _{Smax} - T _S | 150°C 200°C 90±30 sec |
| Soldering zone - Temperature(T) - Time(t _i) | 217°C 60 sec |
| Peak Temperature | 260°C |
| Ramp-up rate | 3°C/sec max. |
| 3°C/sec max. | 3~6°C/sec |



2. Wave Soldering (jedec22a111 compatible) (Wave soldering (JEDEC22A111 compliant)
 Recommended to solder at one time under temperature conditions.

| | |
|---------------------|--------------|
| Temperature | 260+0/-5°C |
| Time | 10 sec |
| Preheat temperature | 5 to 140°C |
| Preheat time | 30 to 80 sec |



3. Hand soldering by soldering iron
 Allow single lead soldering in each process, recommended one-time soldering.

| | |
|-------------|-------------|
| Temperature | 380+0/-5, C |
| Time | 3 sec max |

• Characteristics Curve

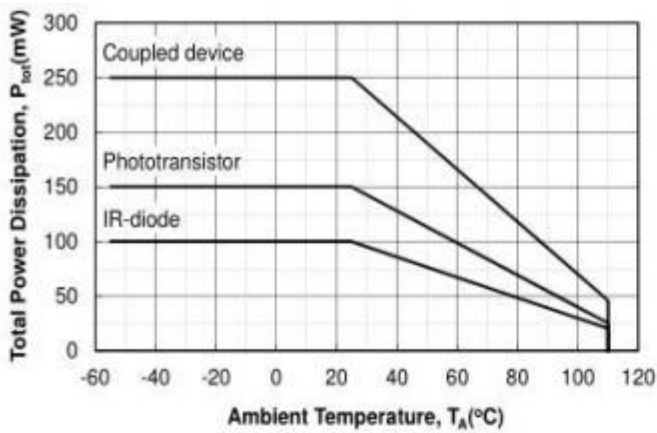


Figure 1. P_{tot} vs. T_A

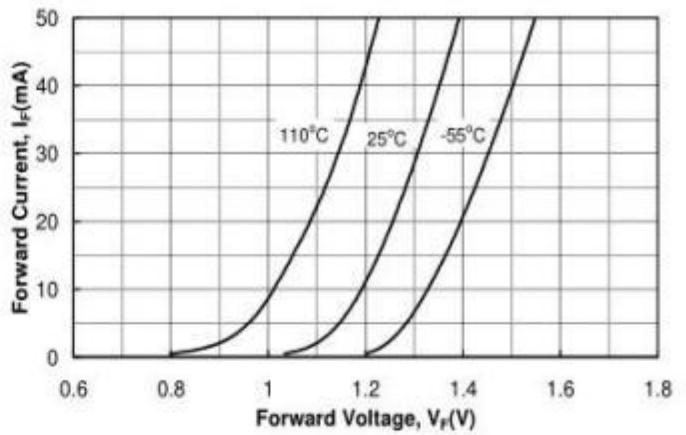


Figure 4. I_F vs. V_F

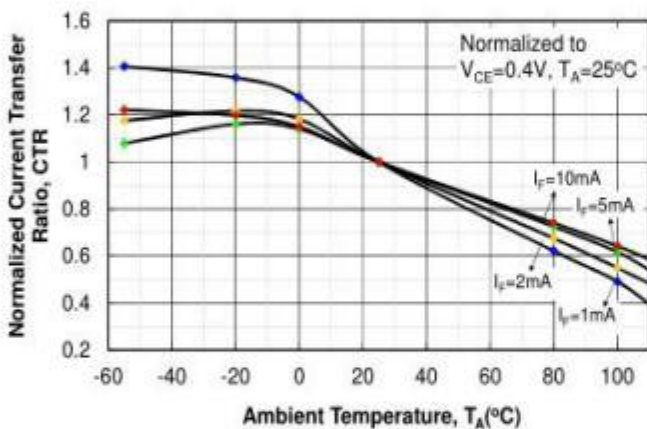


Figure 2. Saturated Normalized CTR vs. T_A

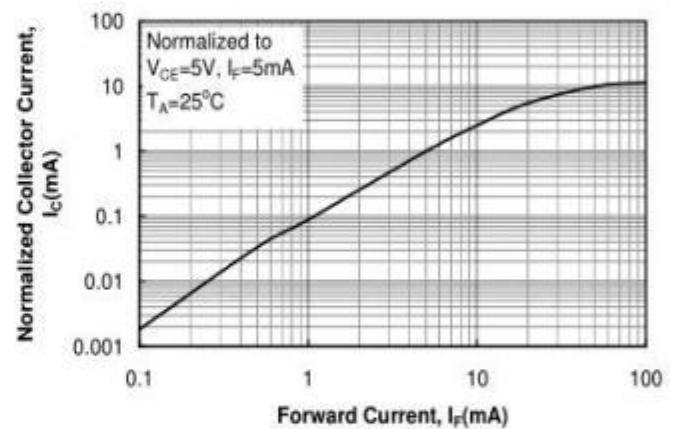


Figure 5. Normalized I_C vs. I_F

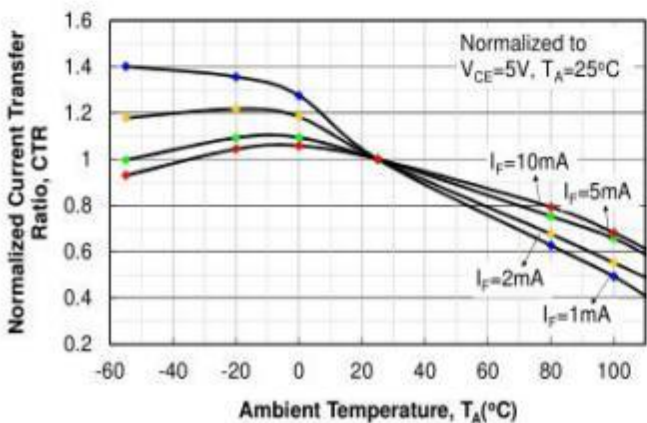


Figure 3. Non-saturated Normalized CTR vs. T_A

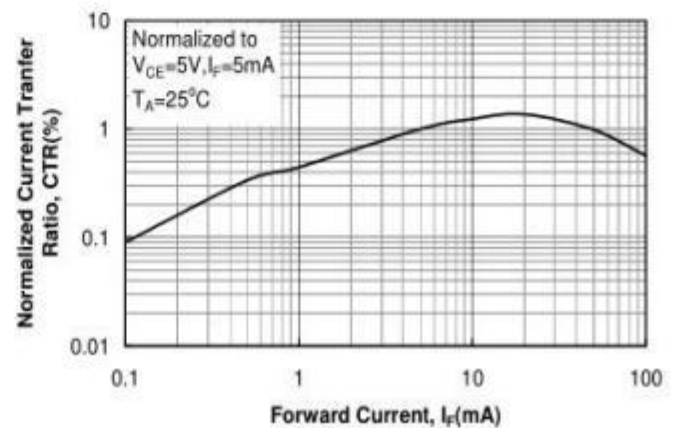


Figure 6. Normalized CTR vs. I_F

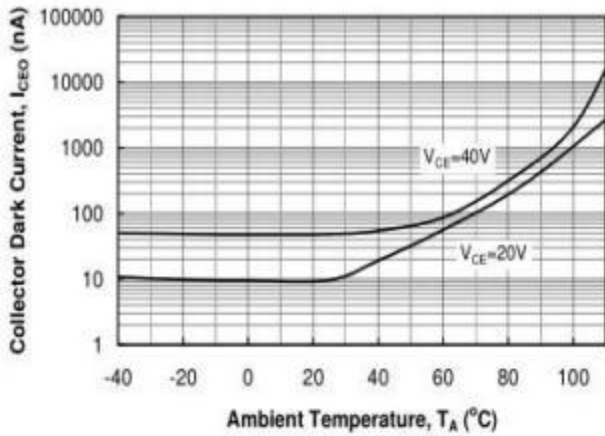


Figure 7. I_{CEO} vs. T_A

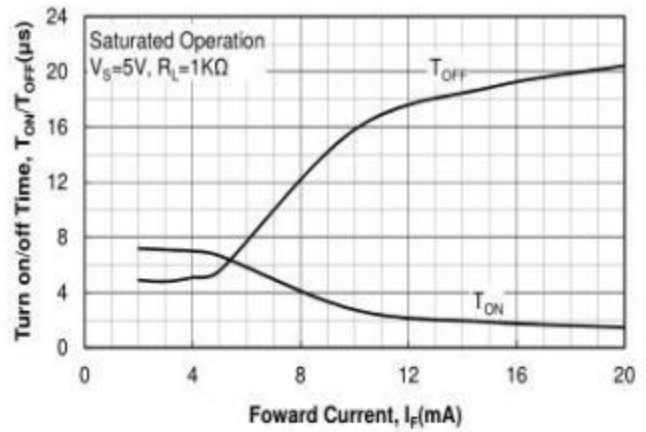


Figure 10. T_{ON} / T_{OFF} vs. I_F

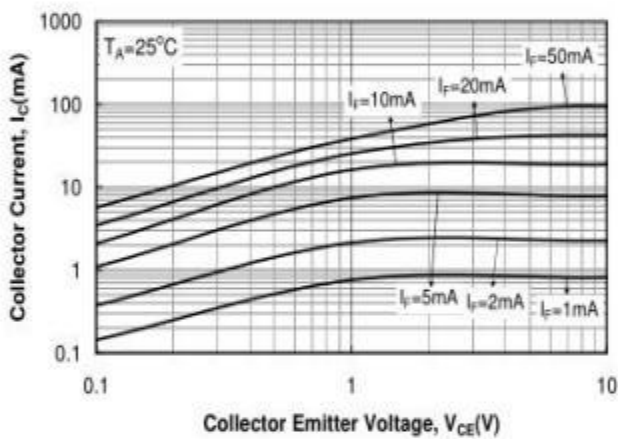


Figure 8. I_C vs. V_{CE}

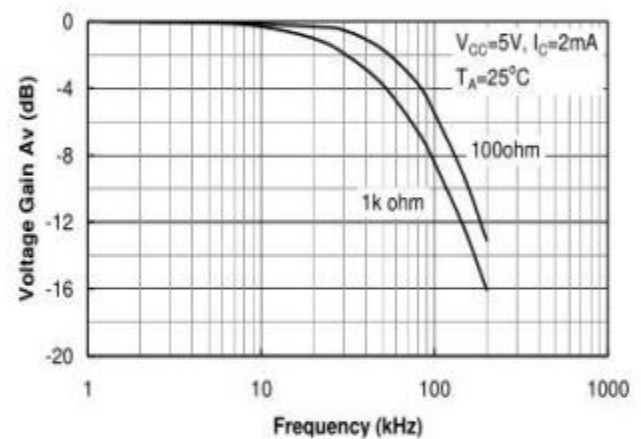


Figure 11. Frequency Response

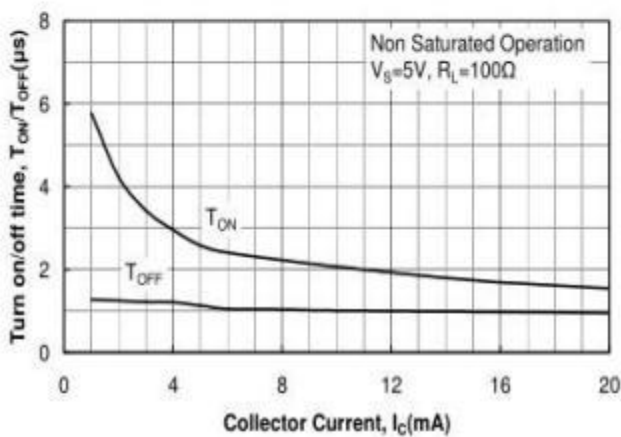


Figure 9. T_{ON} / T_{OFF} vs. I_C