

66015 **3N243**
3N244 **TO-18 OPTOCOUPLERS**
3N245



05/29/03

Features:

- High Reliability
- Base lead eliminated for improved noise immunity
- Rugged package
- Stability over wide temperature
- 1kV electrical isolation

Applications:

- Eliminate ground loops
- Level shifting
- Line receiver
- Switching power supplies
- Motor control

DESCRIPTION

The **66015** contains an infrared LED optically coupled to a silicon phototransistor in a hermetic 4 lead TO-18 package. The collector of the phototransistor is electrically connected to the case. The internal base connection has been eliminated for improved noise immunity. The 3N243, 3N244 and 3N245 can be supplied to commercial or screened quality levels as well as to customer specifications.

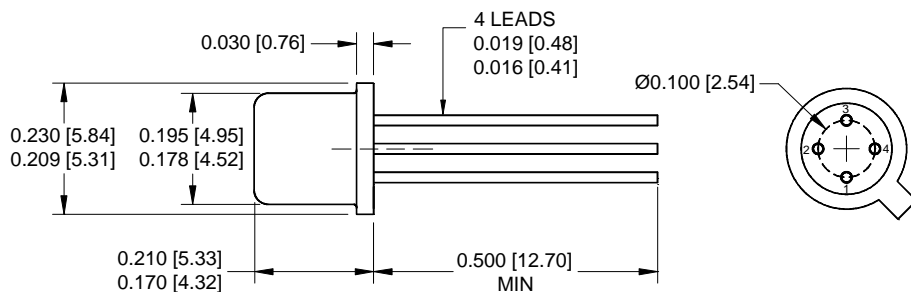
ABSOLUTE MAXIMUM RATINGS

| | |
|--|-----------------|
| Input to Output Voltage | 1000V |
| Emitter-Collector Voltage | 7V |
| Collector-Emitter Voltage | 35V |
| Reverse Input Voltage | 2V |
| Input Diode Continuous Forward Current at (or below) 65°C Free-Air Temperature (see note 1) | 40mA |
| Continuous Collector Current | 50mA |
| Continuous Transistor Power Dissipation at (or below) 25°C Free-Air Temperature (see Note 2) | 190mW |
| Storage Temperature | -55°C to +150°C |
| Operating Free-Air Temperature Range..... | -55°C to +125°C |
| Lead Solder Temperature (10 seconds max, 1/16" from case) | 240°C |

Notes:

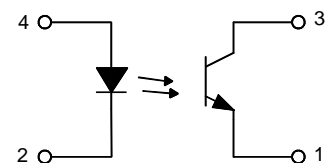
1. Derate linearly to 125°C free-air temperature at the rate of 0.67 mA/°C.
2. Derate linearly to 125°C free-air temperature at the rate of 1.9 mW/°C.

Package Dimensions



ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]

Schematic Diagram



THE COLLECTOR IS IN ELECTRICAL CONTACT WITH THE CASE.

66015 **3N243**
 3N244
 3N245

TO-18 OPTOCOUPLER

05/29/03

ELECTRICAL CHARACTERISTICS

INPUT LED

T_A = 25°C

| PARAMETER | | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|------------------------------------|----------------|-----|-----|-----|-------|-----------------------|
| Input Diode Static Forward Voltage | V _F | 0.8 | | 1.3 | V | I _F = 10mA |
| Input Diode Reverse Current | I _R | | | 100 | μA | V _R = 2 V |

OUTPUT TRANSISTOR

T_A = 25°C

| PARAMETER | SYMBOL | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|-------------------------------------|----------------------|-----|-----|-----|-------|---|
| Collector-Emitter Breakdown Voltage | V _{(BR)CEO} | 35 | | | V | I _C = 1mA, I _F = 0 |
| Emitter-Collector Breakdown Voltage | V _{(BR)ECO} | 7 | | | V | I _E = 100μA, I _F = 0 |
| Collector-Emitter Dark Current | I _D | | | 100 | nA | V _{CE} = 10V, I _F = 0mA |

COUPLED CHARACTERISTICS

T_A = 25°C unless otherwise specified.

| PARAMETER | | SYMBOL | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|--------------------------------------|-------------------------|----------------------|-------------------|-------------|-------------------|-------------|---|
| On State Collector Current | 3N243 3N244 3N245 | I _{C(ON)} | 1.5 3.0 6.0 | | | mA | V _{CE} = 10V, I _F = 10mA |
| Collector-Emitter Saturation Voltage | 3N243 3N244 3N245 | V _{CE(SAT)} | | | 0.3 0.3 0.3 | V V V | I _F = 20mA, I _C = 1.5mA I _F = 20mA, I _C = 3mA I _F = 20mA, I _C = 6mA |
| DC Isolation Voltage | | V _{IO} | 1000 | | | V | I _{IO} = 100nA |
| Rise Time | 3N243 3N244 3N245 | t _r | | 3 3 6 | 20 20 20 | μs | V _{CE} = 10V, I _F = 10mA, R _L = 100Ω |
| Fall Time | 3N243 3N244 3N245 | t _f | | 3 3 6 | 20 20 20 | μs | V _{CE} = 10V, I _F = 10mA, R _L = 100Ω |

RECOMMENDED OPERATING CONDITIONS:

| PARAMETER | SYMBOL | MIN | MAX | UNITS |
|---------------------------|-----------------|-----|-----|-------|
| Input Current, Low Level | I _{FL} | 0 | 10 | μA |
| Input Current, High Level | I _{FH} | 1 | 20 | mA |
| Supply Voltage | V _{CE} | 5 | 10 | V |

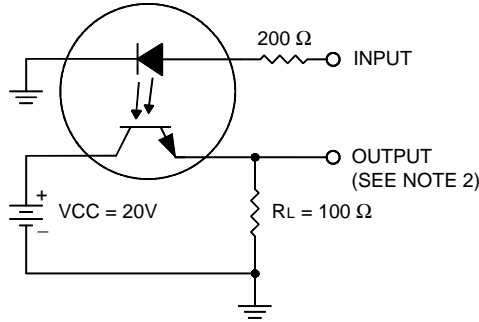
SELECTION GUIDE

| PART NUMBER | PART DESCRIPTION |
|-------------|-------------------|
| 66015-001 | 3N243, Commercial |
| 66015-002 | 3N244, Commercial |
| 66015-003 | 3N245, Commercial |
| 66015-101 | 3N243, Screened |
| 66015-102 | 3N244, Screened |
| 66015-103 | 3N245, Screened |

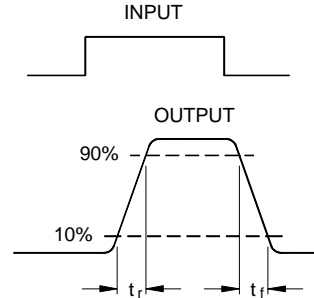
05/29/03

PARAMETER MEASUREMENT INFORMATION

ADJUST AMPLITUDE OF INPUT PULSE FOR
 $I_{C(ON)} = 5 \text{ mA}$



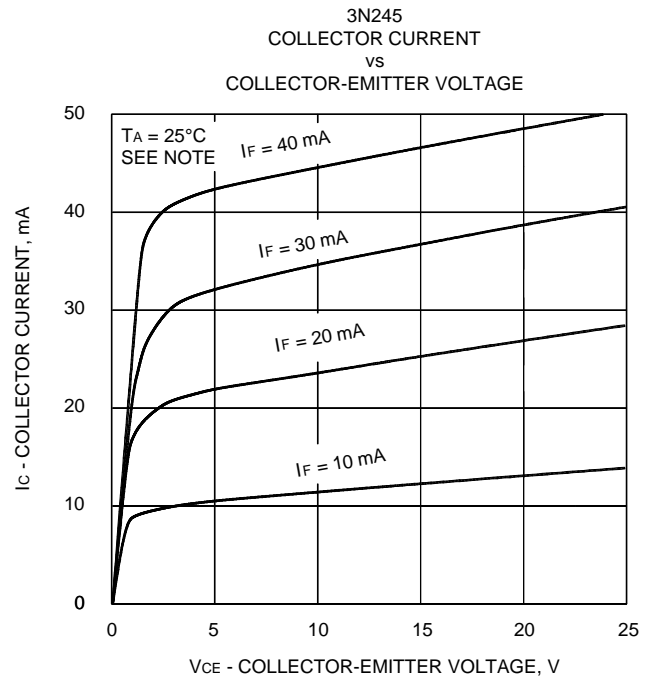
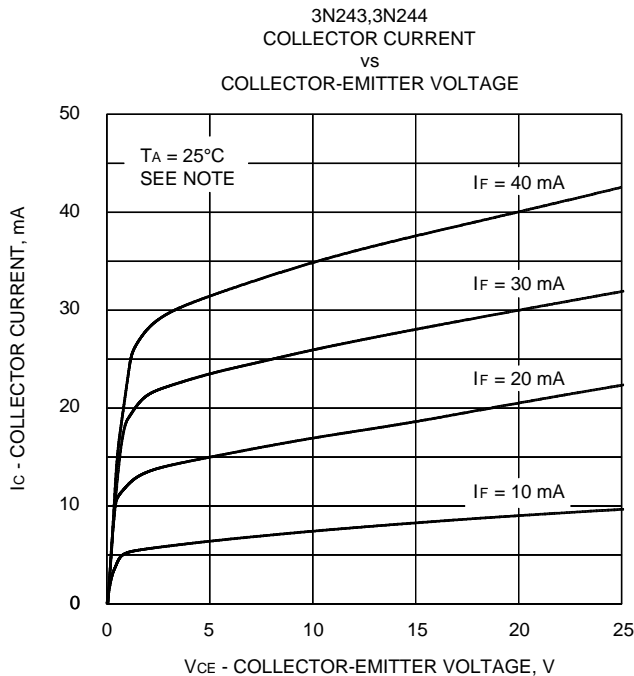
TEST CIRCUIT



VOLTAGE WAVEFORM

- NOTES: 1. The input waveform is supplied by a generator with the following characteristics: $Z_{OUT} = 50 \Omega$, $t_r \leq 15 \text{ ns}$, Duty cycle $\approx 1\%$, $t_w = 100 \mu\text{s}$.
2. Waveforms are monitored on an oscilloscope with the following characteristics: $t_r \leq 12 \text{ ns}$, $R_{IN} \geq 1 \text{ M}\Omega$, $C_{IN} \leq 20 \text{ pF}$.

TYPICAL CHARACTERISTICS

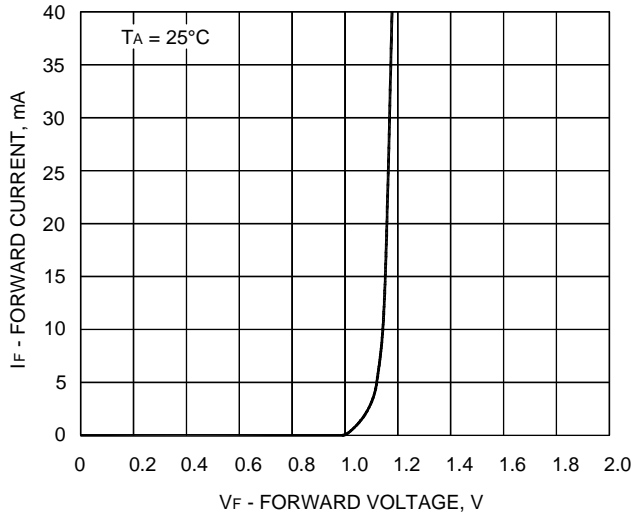


NOTE: This parameter was measured using pulse techniques. $T_w = 100 \mu\text{s}$, duty cycle = 1%.

05/29/03

TYPICAL CHARACTERISTICS (CONTINUED)

INPUT DIODE FORWARD CONDUCTION CHARACTERISTICS



NORMALIZED ON STATE COLLECTOR CURRENT
 vs
 FREE-AIR TEMPERATURE

