



**General
Semiconductor
Industries, Inc.**

**GSTU15018
GSTU15020**

HIGH POWER NPN *Switch Plus*® TRANSISTORS

The GSTU series of NPN transistors is designed for high speed switching systems. This unique series features General Semiconductor Industries' C²R[®] manufacturing process which provides surface stabilization for high voltage operation and enhances long-term reliability.

- **High Speed** ● **Power Supplies** ● **Motor Speed Control Circuits**
- **Rugged** ● **Switching Amplifiers** ● **Switching Regulators**
- **Cost Effective** ● **Inverters/Converters** ● **Solenoid & Relay Drivers**

**NPN
180, 200, V
15 AMP SWITCHING
t_f — 200ns TYPICAL**

TO-204AA (TO-3)

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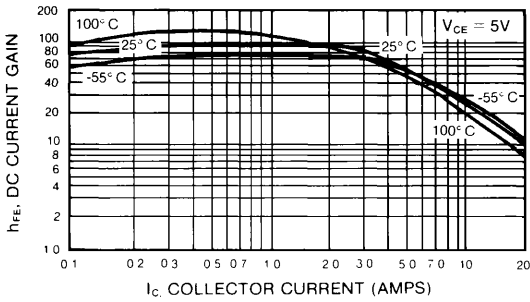
**NPN SWITCHING
TRANSISTORS**

| MAXIMUM RATINGS (T _C = 25°C unless otherwise noted) | | | | | |
|---|--|-------------|-------------|-------|--|
| RATING | SYMBOL | GSTU15018 | GSTU15020 | UNIT | |
| Collector-Base Voltage | V _{CB0} | 250 | 300 | Volts | |
| Collector-Emitter Voltage | V _{CEO} | 180 | 200 | Volts | |
| Emitter-Base Voltage | V _{EBO} | 8.0 | 8.0 | Volts | |
| Collector Current—Continuous | I _C | 20 | 20 | Amps | |
| Peak | I _{CM} | 25 | 25 | Amps | |
| Base Current—Continuous | I _B | 5.0 | 5.0 | Amps | |
| Total Power Dissipation @ T _C = 25°C | P _D | 140 | 140 | Watts | |
| Junction to Case Thermal Resistance | R _{θJC} | 1.25 | 1.25 | °C/W | |
| Operating and Storage Junction Temperature Range | T _{J(oper)} T _{stg} | -65 to +200 | -65 to +200 | °C | |

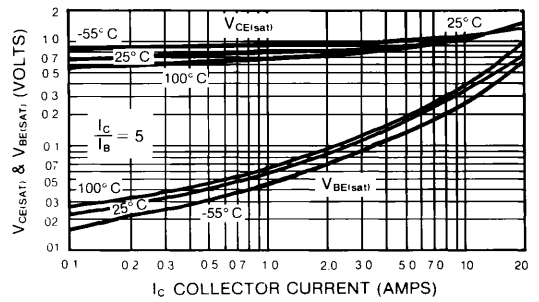
| ELECTRICAL CHARACTERISTICS (T _C = 25°C unless otherwise noted) | | | | | | |
|--|--|-----------|------|-----------|------|-------|
| SYMBOL | CONDITIONS | GSTU15018 | | GSTU15020 | | Unit |
| | | Min | Max | Min | Max | |
| V _{CB0} | I _C = 1mA | 300 | — | 350 | — | Volts |
| V _{CEO} | I _C = 50mA | 180 | — | 200 | — | Volts |
| V _{EBO} | I _E = 1mA | 8.0 | — | 8.0 | — | Volts |
| I _{CB0} | V _{CB} = 80% of Rated V _{CB0} | — | 100 | — | 100 | μA |
| I _{EBO} | V _{EB} = 5V | — | 100 | — | 100 | μA |
| h _{FE} | V _{CE} = 5V, I _C = 15A † | 10 | — | 10 | — | — |
| V _{CE(sat)} | I _C = 15A, I _B = 3A † | — | 0.8 | — | 0.8 | Volts |
| V _{BE(sat)} | I _C = 15A, I _B = 3A † | — | 1.5 | — | 1.5 | Volts |
| f _T | V _{CE} = 10V, I _C = 1A, f = 10MHz | 25 | — | 25 | — | MHz |
| C _{obo} | V _{CB} = 10V, f = 1MHz | — | 200 | — | 200 | pF |
| SWITCHING | | Typ | Max | Typ | Max | Unit |
| t _d | Resistive Load V _{CC} = 125V, I _C = 15A, R = 8.3Ω I _{B1} = I _{B2} = 3A, V _{BB2} = 6V t _p = 50μs. | 0.04 | 0.05 | 0.04 | 0.05 | μs |
| t _r | | 0.40 | 0.60 | 0.40 | 0.60 | μs |
| t _s | | 0.70 | 1.20 | 0.70 | 1.20 | μs |
| t _f | | 0.20 | 0.30 | 0.20 | 0.30 | μs |
| t _s | | 0.60 | 1.40 | 0.60 | 1.40 | μs |
| t _{rv} | Inductive Load V _{CC} = 30V, I _C = 15A, L = 100μH I _{B1} = I _{B2} = 3A, V _{BB2} = 6V V _{CLAMP} = 125V, t _p = 50μs | 0.10 | 0.25 | 0.10 | 0.25 | μs |
| t _{ri} | | 0.10 | 0.30 | 0.10 | 0.30 | μs |
| t _c | | 0.20 | 0.50 | 0.20 | 0.50 | μs |
| t _s 100°C | | 0.80 | 1.60 | 0.80 | 1.60 | μs |
| t _{rv} 100°C | | 0.15 | 0.20 | 0.15 | 0.20 | μs |
| t _{ri} 100°C | | 0.15 | 0.30 | 0.15 | 0.30 | μs |
| t _c 100°C | | 0.30 | 0.50 | 0.30 | 0.50 | μs |

† Pulse Conditions: Width = 300μs, Duty Cycle ≤ 2% (measured using Kelvin connections).

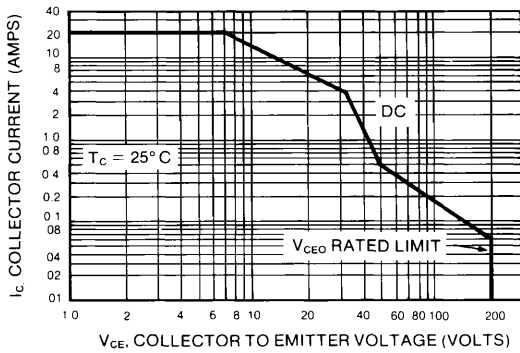
TYPICAL DC CURRENT GAIN



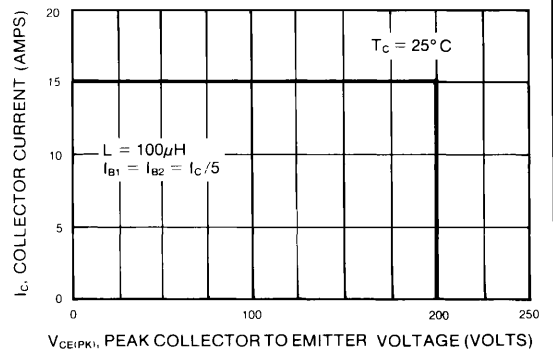
TYPICAL SATURATION VOLTAGE



FORWARD BIASED SAFE OPERATING AREA



TURN-OFF SAFE OPERATING AREA



PACKAGE OUTLINE

