

Fuji Discrete Package IGBT

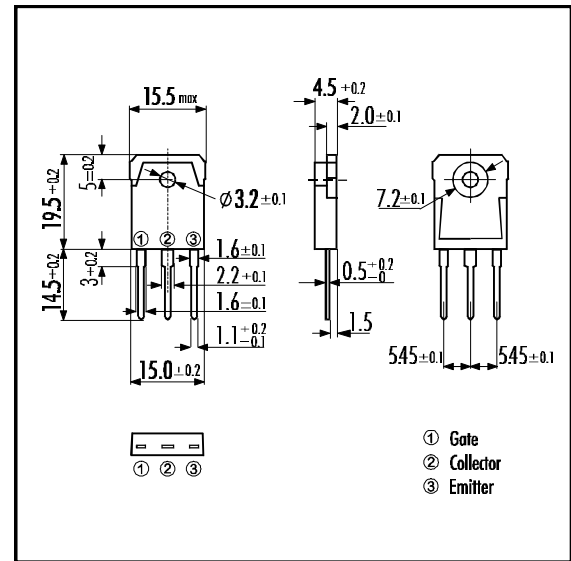
■ Features

- Square RBSOA
- Low Saturation Voltage
- Less Total Power Dissipation
- Minimized Internal Stray Inductance

■ Applications

- High Power Switching
- A.C. Motor Controls
- D.C. Motor Controls
- Uninterruptible Power Supply

■ Outline Drawing

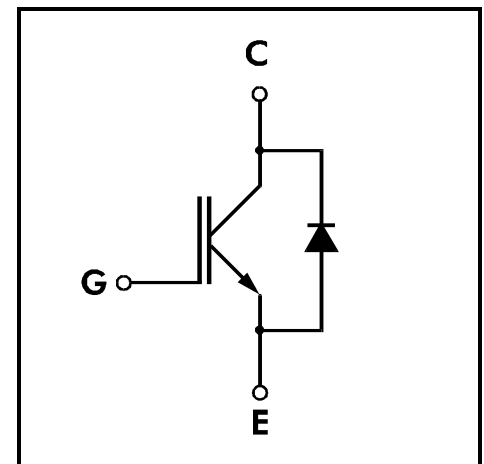


■ Maximum Ratings and Characteristics

• Absolute Maximum Ratings (T_c=25°C)

| Items | Symbols | Ratings | Units |
|-----------------------------|---------------------------|----------------------|-------|
| Collector-Emitter Voltage | V _{CES} | 600 | V |
| Gate -Emitter Voltage | V _{GES} | ± 20 | V |
| Collector Current | DC T _c = 25°C | I _{C 25} | 33 |
| | DC T _c =100°C | I _{C 100} | 15 |
| | 1ms T _c = 25°C | I _{C PULSE} | 132 |
| IGBT Max. Power Dissipation | P _C | 120 | W |
| FWD Max. Power Dissipation | P _C | 60 | W |
| Operating Temperature | T _I | +150 | °C |
| Storage Temperature | T _{stg} | -40 ~ +150 | °C |
| Mounting Screw Torque | | 50 | Nm |

■ Equivalent Circuit



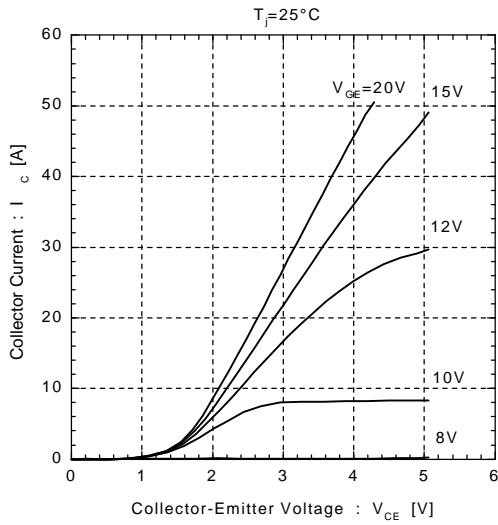
• Electrical Characteristics (at T_j=25°C)

| Items | Symbols | Test Conditions | Min. | Typ. | Max. | Units |
|--------------------------------------|----------------------|---|-----------------------|------|------|-------|
| Zero Gate Voltage Collector Current | I _{CES} | V _{GE} =0V V _{CE} =600V | | | 1.0 | mA |
| Gate-Emitter Leakage Current | I _{GES} | V _{CE} =0V V _{GE} =± 20V | | | 20 | μA |
| Gate-Emitter Threshold Voltage | V _{GE(th)} | V _{GE} =20V I _C =15mA | 5.5 | | 8.5 | V |
| Collector-Emitter Saturation Voltage | V _{CE(sat)} | V _{GE} =15V I _C =15A | | | 3.0 | V |
| Input capacitance | C _{ies} | V _{GE} =0V | | 1000 | | pF |
| Output capacitance | C _{oes} | V _{CE} =10V | | 200 | | |
| Reverse Transfer capacitance | C _{res} | f=1MHz | | 40 | | |
| Switching Time | Turn-on Time | t _{ON} | V _{CC} =300V | | 1.2 | μs |
| | | t _r | I _C =15A | | 0.6 | |
| | Turn-off Time | t _{OFF} | V _{GE} =±15V | | 1.0 | |
| | | t _f | R _G =160Ω | | 0.35 | |
| | Turn-on Time | t _{ON} | V _{CC} =300V | 0.16 | | μs |
| | | t _r | I _C =15A | 0.11 | | |
| | Turn-off Time | t _{OFF} | V _{GE} =+15V | 0.30 | | |
| | | t _f | R _G =16Ω | | 0.35 | |
| Diode Forward On-Voltage | V _F | I _F =15A V _{GE} =0V | | | 3.0 | V |
| Reverse Recovery Time | t _{rr} | I _F =15A, V _{GE} =-10V, di/dt=100A/μs | | | 300 | ns |

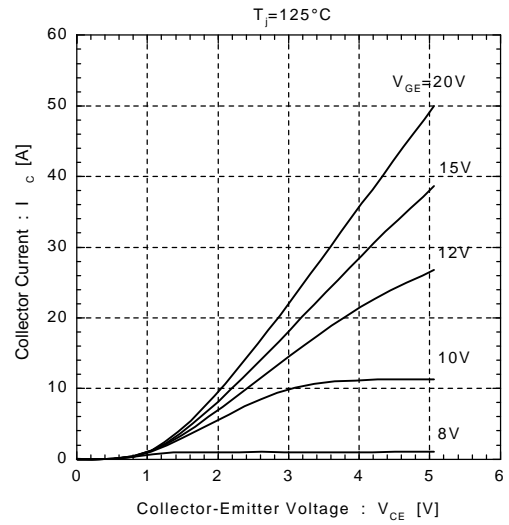
• Thermal Characteristics

| Items | Symbols | Test Conditions | Min. | Typ. | Max. | Units |
|--------------------|----------------------|-----------------|------|------|------|-------|
| Thermal Resistance | R _{th(j-c)} | IGBT | | | 1.04 | °C/W |
| | R _{th(j-e)} | Diode | | | 2.08 | |

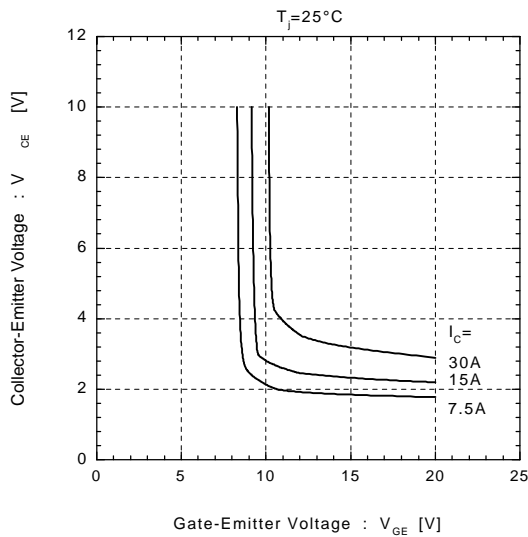
Collector Current vs. Collector-Emittor Voltage



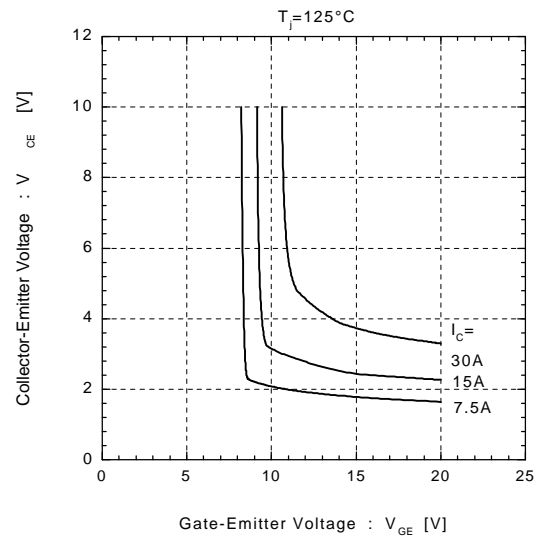
Collector Current vs. Collector-Emittor Voltage



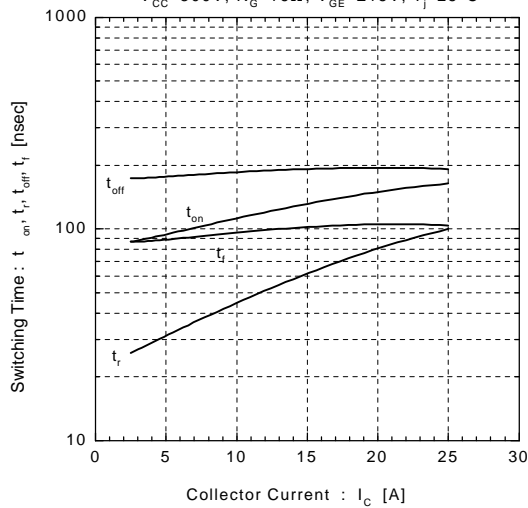
Collector-Emittor Voltage vs. Gate-Emittor Voltage



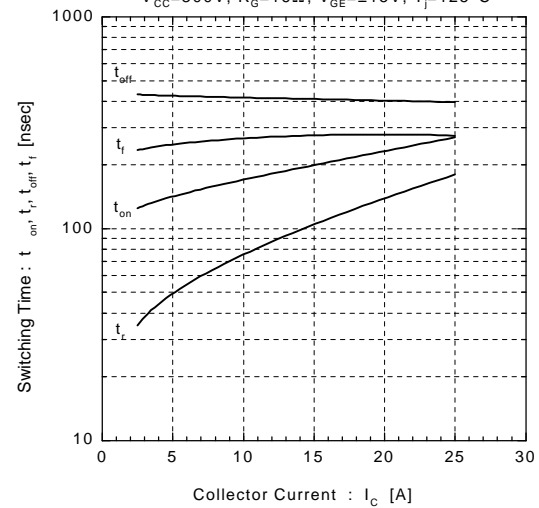
Collector-Emittor Voltage vs. Gate-Emittor Voltage

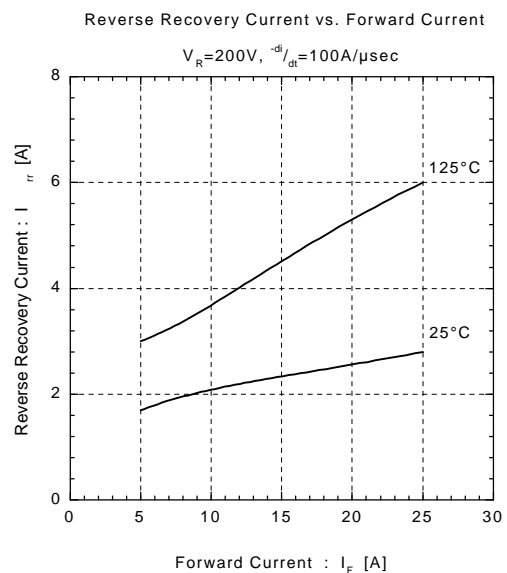
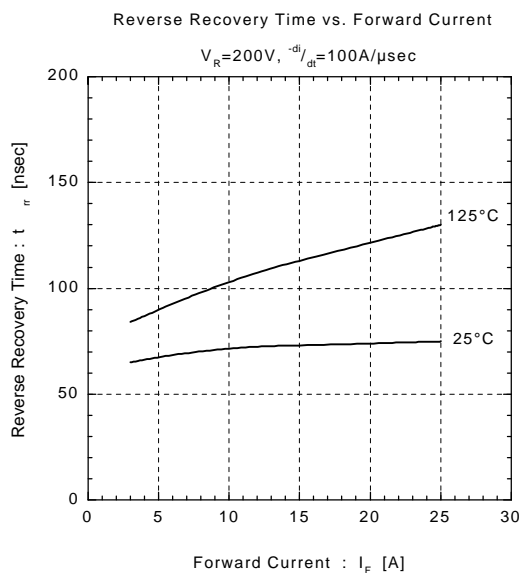
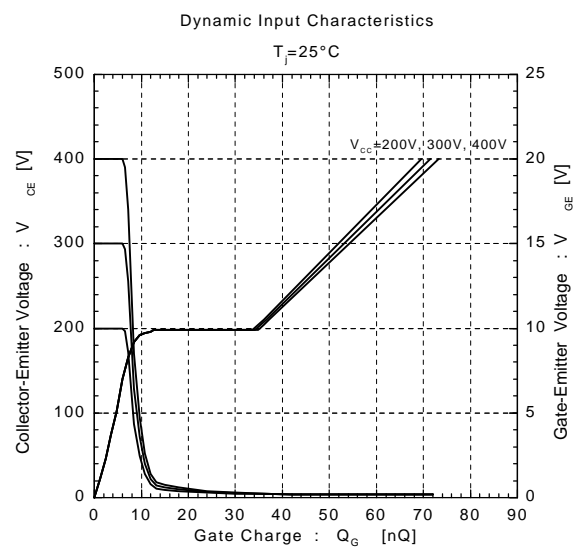
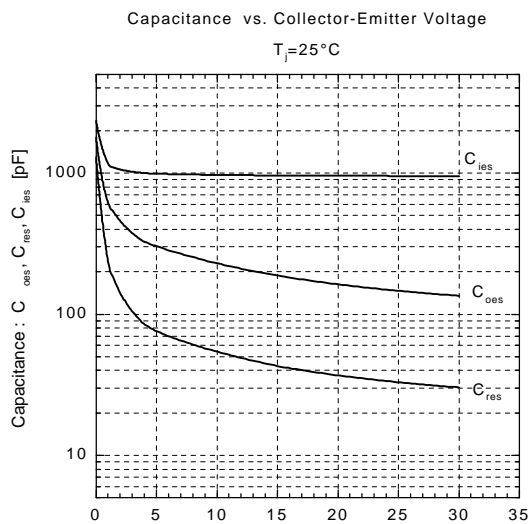
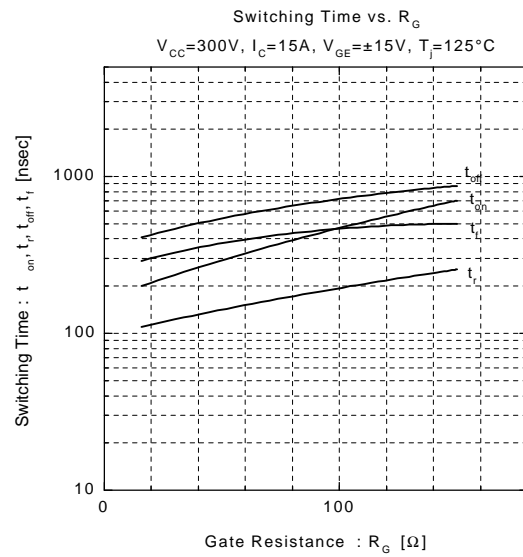
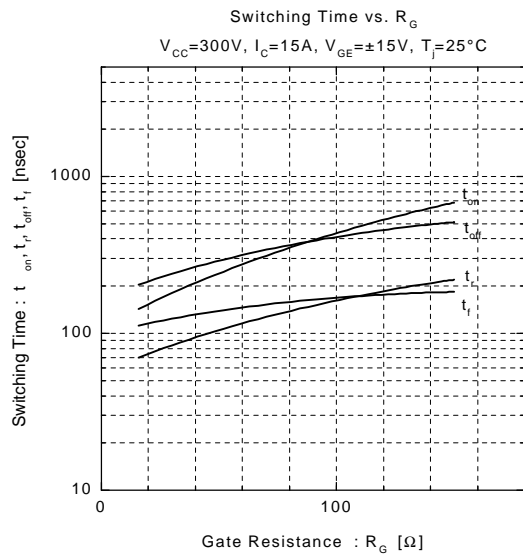


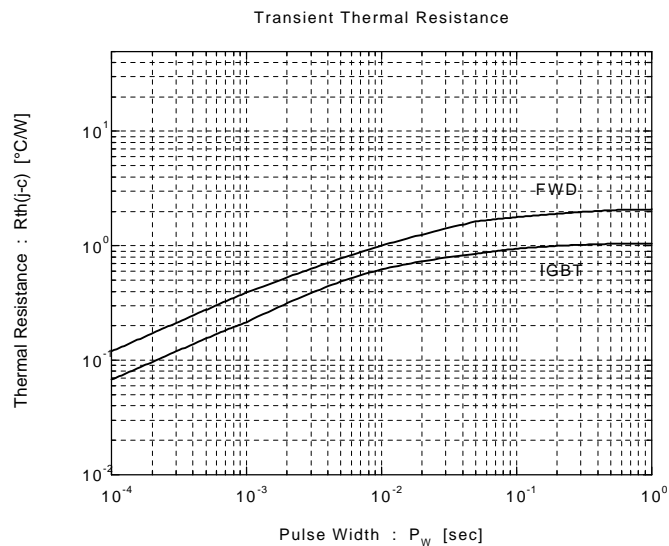
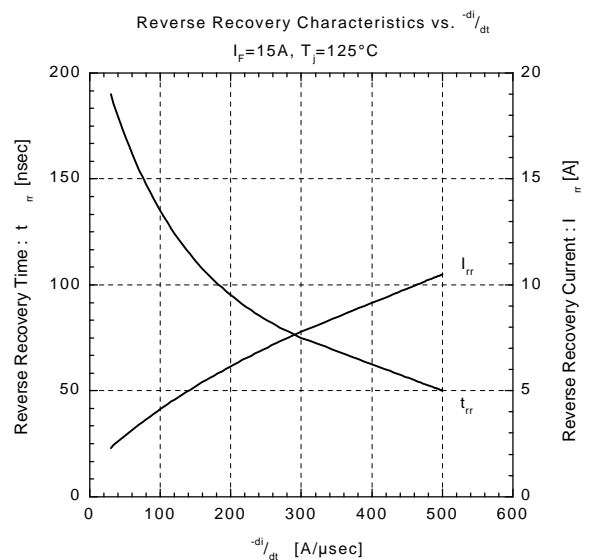
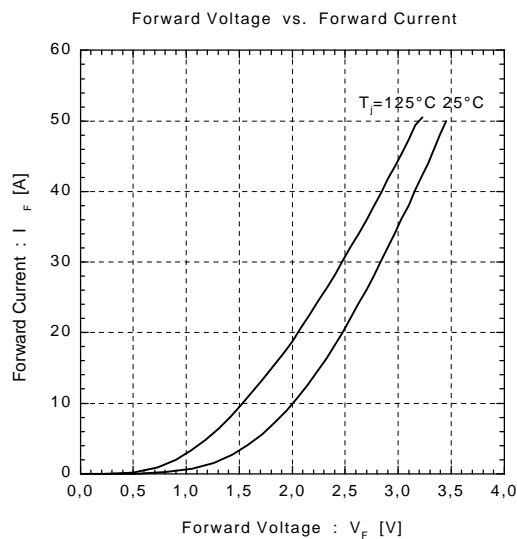
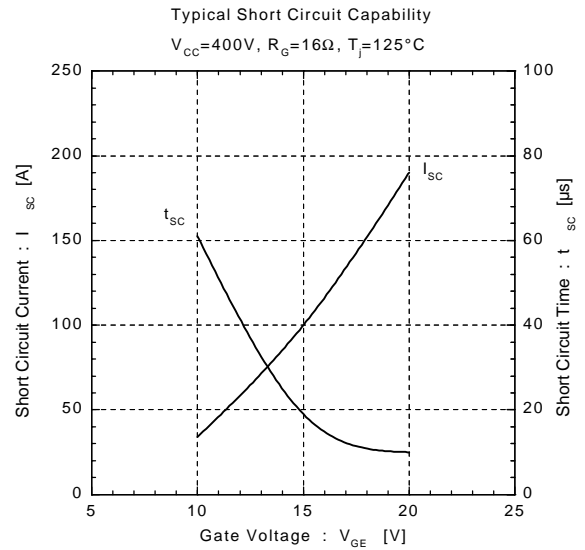
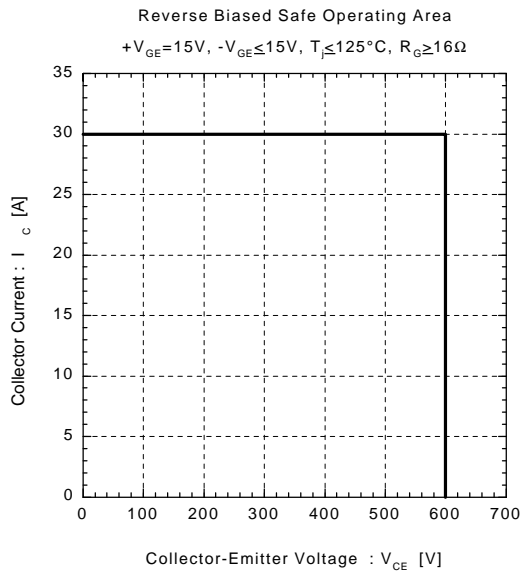
Switching Time vs. Collector Current
 $V_{CC} = 300V, R_G = 16\Omega, V_{GE} = \pm 15V, T_J = 25^\circ\text{C}$



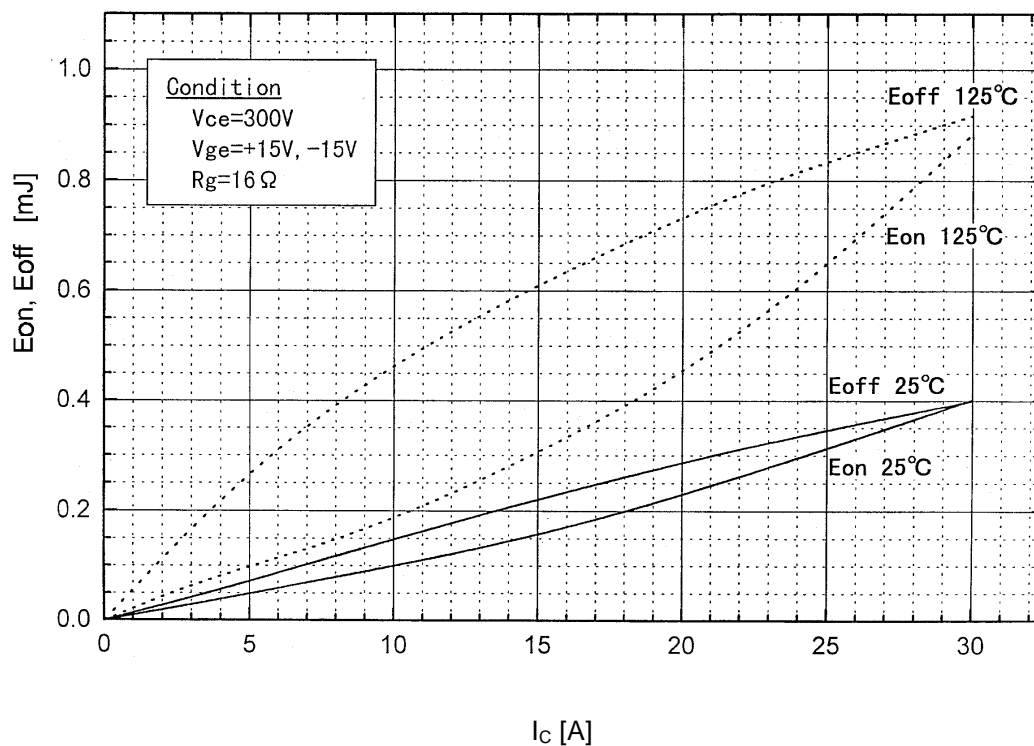
Switching Time vs. Collector Current
 $V_{CC} = 300V, R_G = 16\Omega, V_{GE} = \pm 15V, T_J = 125^\circ\text{C}$



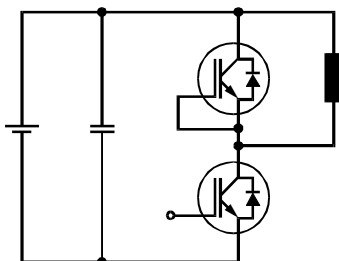




Switching losses (E_{on} , E_{off} vs. I_c)



Test Circuit



Switching waveforms

