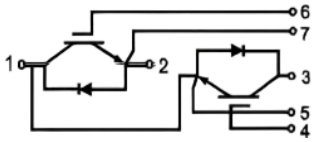
## 62mm Standard Housing IGBT Moudle

DESCRIPTION

VCES=1200V,Ic=400A,VCE(sat)=2.2V for a 100°C junction operation temperature, the module accommodates a Half bridge configuration of Trench-Field Stop IGBT and matching emitter controlled diodes.




### FEATURES

- Low collector to emitter saturation voltage
- Switching-Loss rating includes all "tail" losses
- Optimized for Fast Switching

### APPLICATIONS

- Uninterruptible Power Supply
- Induction Heating
- High Power Converters
- Electric welding machine

### MAXIMUM RATED VALUES(IGBT Inverter)

Absolute Maximum Ratings(Tj=25℃ unless otherwise noted)

| Symbol | Parameter | Conditions | Value | Unit |
|---|---|---|---|---|
| VcES | Collector to Emitter Voltage | | 1200 | V |
| VGES | Continuous Gate to Emitter Voltage | | ±20 | V |
| Ic | Continuous Collector Current | Tc=100℃ | 400 | A |
| | | Tc=25℃ | 800 | A |
| IcM | Pulse Collector Current | tp=1ms | 800 | A |
| Pd | Maximum Power Dissipation (IGBT) | Tc=25℃,Tj=175℃ | 1666 | W |

### MAXIMUM RATED VALUES (Diode Inverter)

Absolute Maximum Ratings(Tr=25℃ unless otherwise noted)

| | | | | |
|---|---|---|---|---|
| **VRRM** | Repetitive peak reverse voltage | | 1200 | V |
| Ip | Diode Continuous Forward Current | Tc=100℃ | 400 | A |
| IFM | Peak FWD Current Repetitive | tp=1ms | 800 | A |

### ELECTRICAL CHARACTERISTICS VALUES(IGBT)

Static characteristics (Tj=25℃)

| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| VGE(th) | Gate-Emitter Threshold Voltage | Ic=1mA,VcE=VGE, Tj=25°C | | 4.5 | 5.5 | 6.5 | V |
| VcE(sat) | Collector-Emitter Saturation Voltage | Ic=400A, VGE=15 V | Tj=25°C | | 2.2 | | V |
| | | | Tj=150°C | | 2.5 | | |
| IcES | Collector-Emitter Leakage Current | VGE=0V, VcE=VcEs,Tj=25°C | | | | 1.0 | mA |
| IGES | Gate-Emitter Leakage Current | VGE=±20V, VcE=0V,Tj=25°C | | -100 | | 100 | nA |
| Cies | Input Capacitance | VcE=25V, VGE=0V,f=1MHz | | | 39.6 | | pF |
| Cres | Reverse transfer Capacitance | | | | 0.92 | | |
| Rgint | Internal gate resistor | | | | 0.2 | | Ω |

Switching Characteristics

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| td(on) | Turn-on Delay Time | Vcc=600V, Ic=400A, VGE=±15V, L=525uH, Rg=10Ω | Tj=25°C | | 109 | | ns |
| | | | TJ=150°C | | 94 | | |
| tr | Rise Time | | Tj=25°C | | 141 | | ns |
| | | | Tj=150°C | | 150 | | |
| td(off) | Turn-off Delay Time | | TJ=25°C | | 472 | | ns |
| | | | Tj=150°C | | 500 | | |
| tf | Fall Time | | Tj=25°C | | 95 | | ns |
| | | | TJ=150°C | | 114 | | |
| Eon | Turn-on Switching Loss | | Tj=25°C | | 55.2 | | mJ |
| | | | TJ=150°C | | 74 | | |
| Eoff | Turn-off Switching Loss | | TJ=25°C | | 25.2 | | mJ |
| | | | TJ=150°C | | 30.4 | | |
| ReJC | Junction-To-Case(IGBT) | | | | 0.09 | | K/W |

**ELECTRICAL CHARACTERISTICS VALUES(DIODE)**

Static characteristics (Tj=25°C)

| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| | | | Tj=25°C | | 2.8 | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| VFM | Forward Voltage | I=400A,VGE=0V | Tj=150℃ | | 2.3 | | V |

Switching Characteristics

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Ir | Peak Reverse Recovery Current | Ip=400A, Vcc=600V, VGE=-15V, L=525uH, Rg=10Ω | T=25℃ | | 110 | | A |
| | | | Tj=150℃ | | 190 | | |
| Q | Reverse Recovery Charge | | Tʒ=25℃ | | 14.2 | | μC |
| | | | T=150℃ | | 39 | | |
| Erec | Reverse Recovery Energy | | Tj=25℃ | | 3.8 | | mJ |
| | | | T=150℃ | | 12.0 | | |
| RoJC | Junction-To-Case Diode | | | | 0.15 | | K/W |

**Module Characteristics**

| | | | | | | |
|---|---|---|---|---|---|---|
| Viso | Isolation Voltage | f=50Hz,t=1min | 4000 | | | V |
| T | Maximum Junction Temperature | | | | 175 | ℃ |
| TJoP | Maximum Operating Junction Temperature Range | | -40 | | +150 | ℃ |
| Tstg | Storage Temperature | | -40 | | +150 | ℃ |
| Recs | Case-To-Sink(Conductive Grease Applied) | | | 0.01 | | K/W |
| M | Power Terminals Screw:M6 | | 2.5 | | 5.0 | N ·m |
| M | Mounting Screw:M6 | | 3.0 | | 5.0 | N ·m |
| G | Weight | | | 320 | | g |

**CHARACTERISTICS DIAGRAMS**

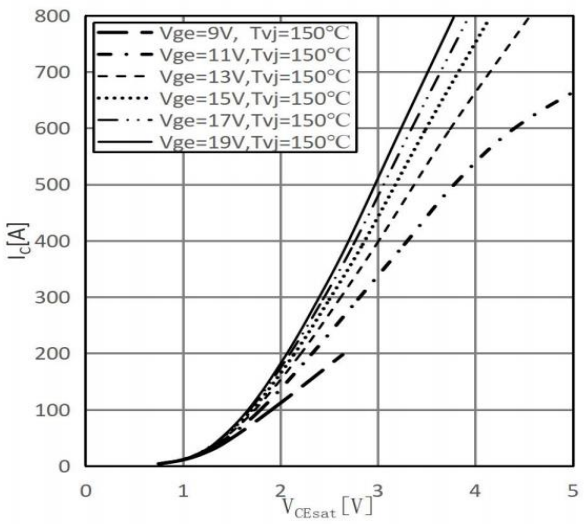



Fig.1 output characteristic IGBT Inverter (typical)

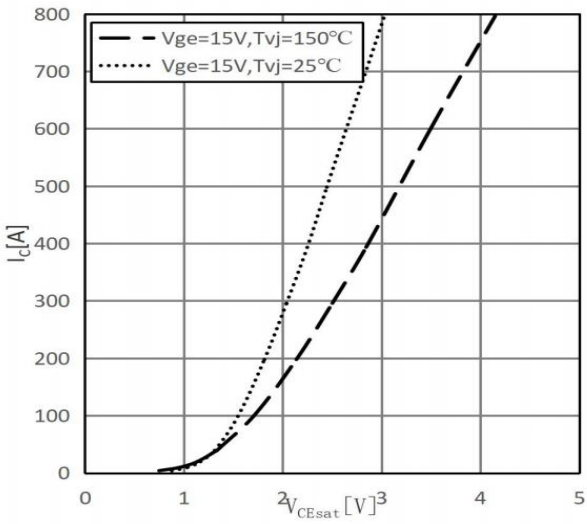



Fig.2 output characteristic IGBT Inverter (typical)

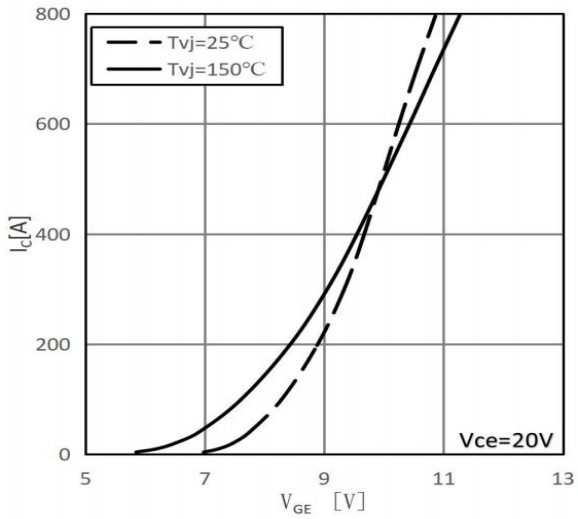



Fig.3 transfer characteristic IGBT Inverter (typical)

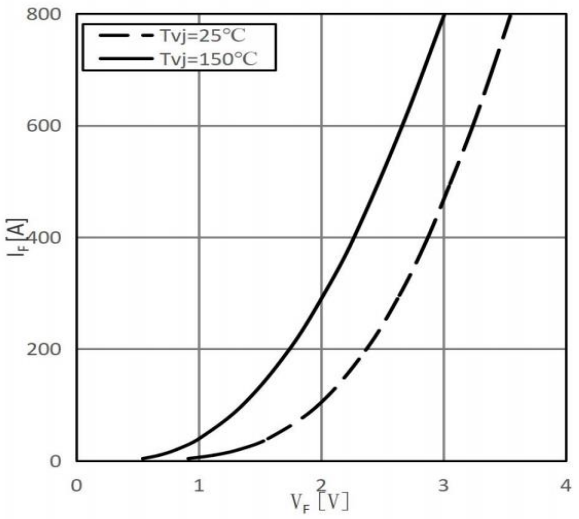



Fig.4 forward characteristic of Diode, Inverter (typical)

$V_{CC}$=600V， $V_{CE}$=±15V
$R_G$=10Ω

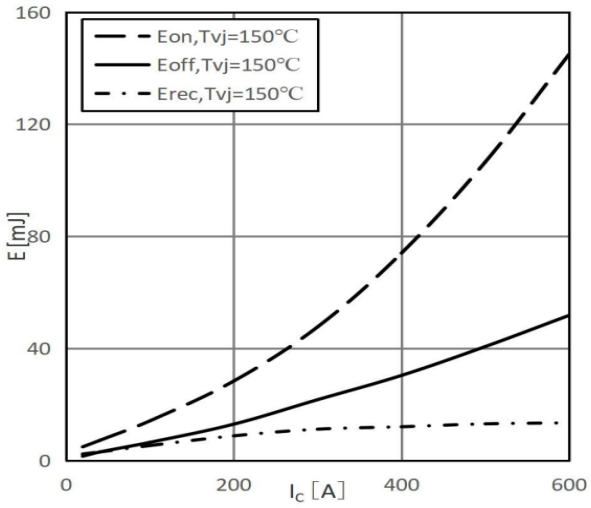



Fig.5 switching losses IGBT Inverter (typical)

$V_{CC}$=600V， $V_{CE}$=±15V
$I_C$=400A

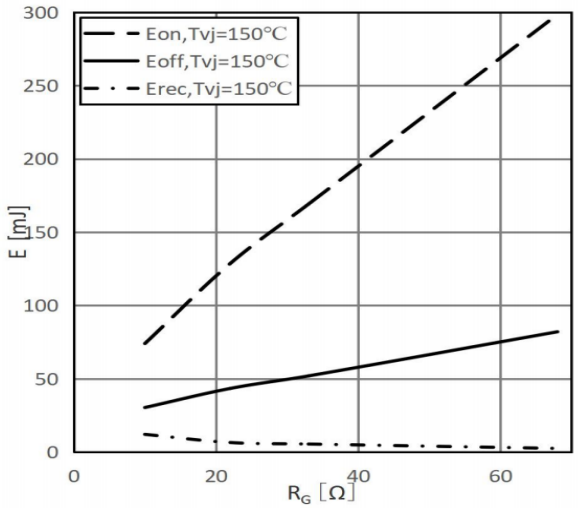



Fig.6 switching Losses vs. Gate Resistance (Typical)

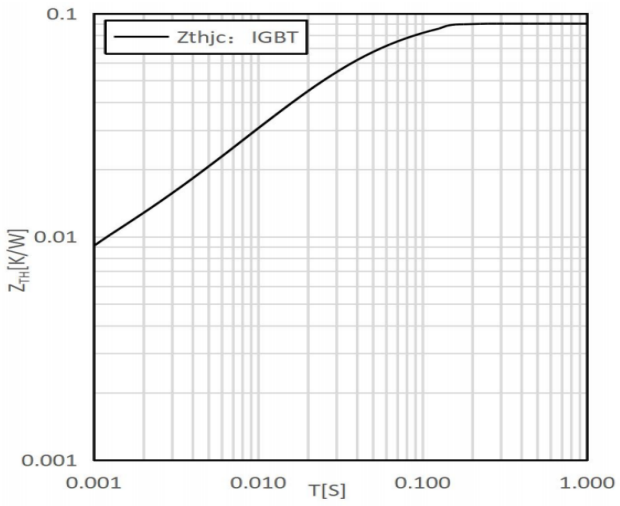



Fig.7 Transient thermal impedance IGBT

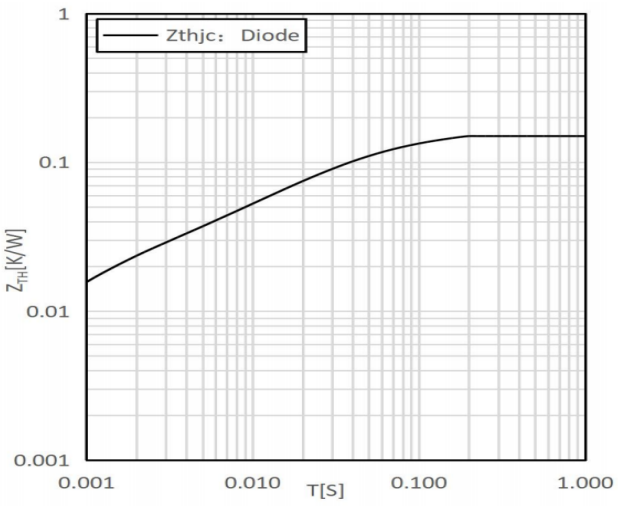
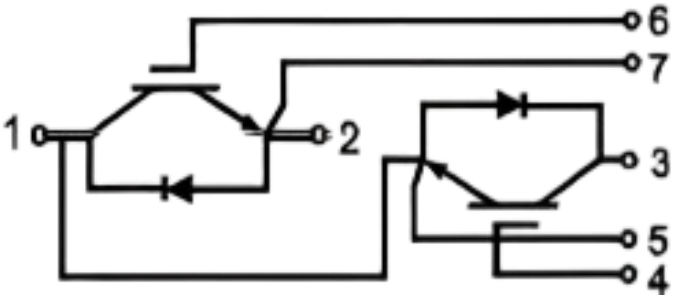
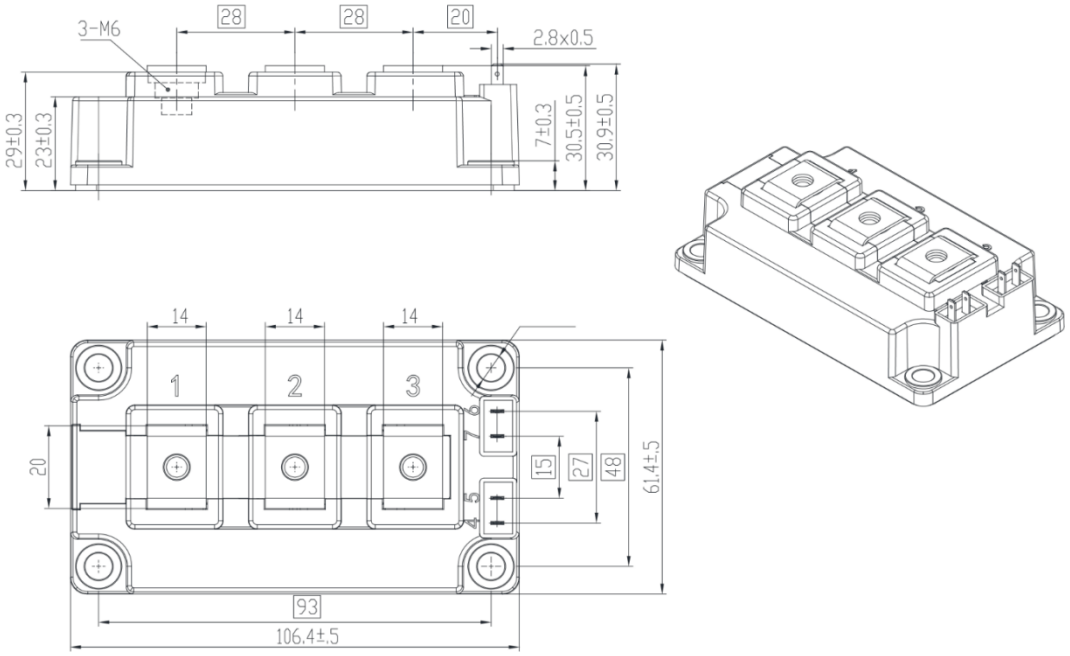



Fig.8 Transient thermal impedance Diode

## CIRCUIT DIAGRAM




## PACKAGE OUTLINES

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| Date of change | Rev # | Revise content |
|---|---|---|
| 20222/4/06 | A/0 | First edition release |
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