<IGBT Modules>

# CM100TX-24T/CM100TXP-24T

**HIGH POWER SWITCHING USE**
**INSULATED TYPE**

TX

Collector current $I_C$ ..... **100** A
Collector-emitter voltage $V_{CES}$ ..... **1200** V
Maximum junction temperature $T_{vjmax}$ ..... **175** °C
- Flat base type
- Copper base plate (Nickel-plating)
- RoHS Directive compliant
- Tin-plating pin terminals

TXP

Collector current $I_C$ ..... **100** A
Collector-emitter voltage $V_{CES}$ ..... **1200** V
Maximum junction temperature $T_{vjmax}$ ..... **175** °C
- Flat base type
- Copper base plate (Nickel-plating)
- RoHS Directive compliant
- Tin-plating pressfit terminals

**sixpack (three-phase bridge)**

- UL Recognized under UL1557, File No. E323585

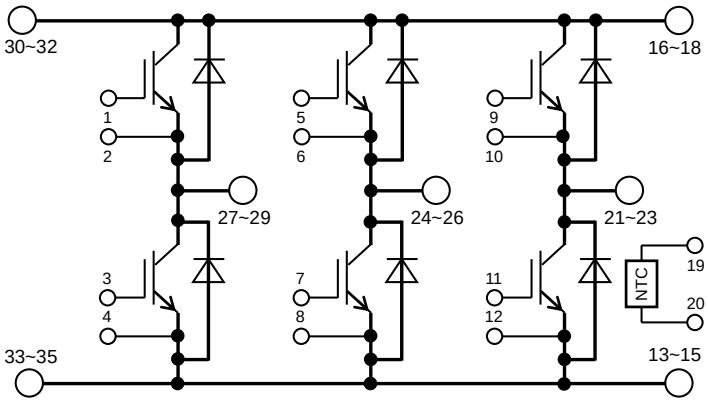
## APPLICATION

AC Motor Control, Motion/Servo Control, Power supply, etc.

## OPTION (Below options are available.)

- PC-TIM (Phase Change Thermal Interface Material) pre-apply

## INTERNAL CONNECTION



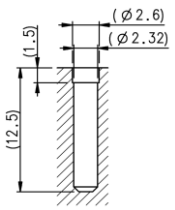

## Terminal code

| | | |
|---|---|---|
| 1 GUP | 13 N1 | 24 V |
| 2 EUP | 14 N1 | 25 V |
| 3 GUN | 15 N1 | 26 V |
| 4 EUN | 16 P1 | 27 U |
| 5 GVP | 17 P1 | 28 U |
| 6 EVP | 18 P1 | 29 U |
| 7 GVN | 19 TH1 | 30 P |
| 8 EVN | 20 TH2 | 31 P |
| 9 GWP | 21 W | 32 P |
| 10 EWP | 22 W | 33 N |
| 11 GWN | 23 W | 34 N |
| 12 EWN | | 35 N |

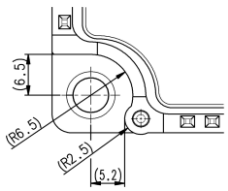
## OUTLINE DRAWING

**Dimension in mm**

COM. SECTION A




MOUNTING HOLES




Tolerance otherwise specified

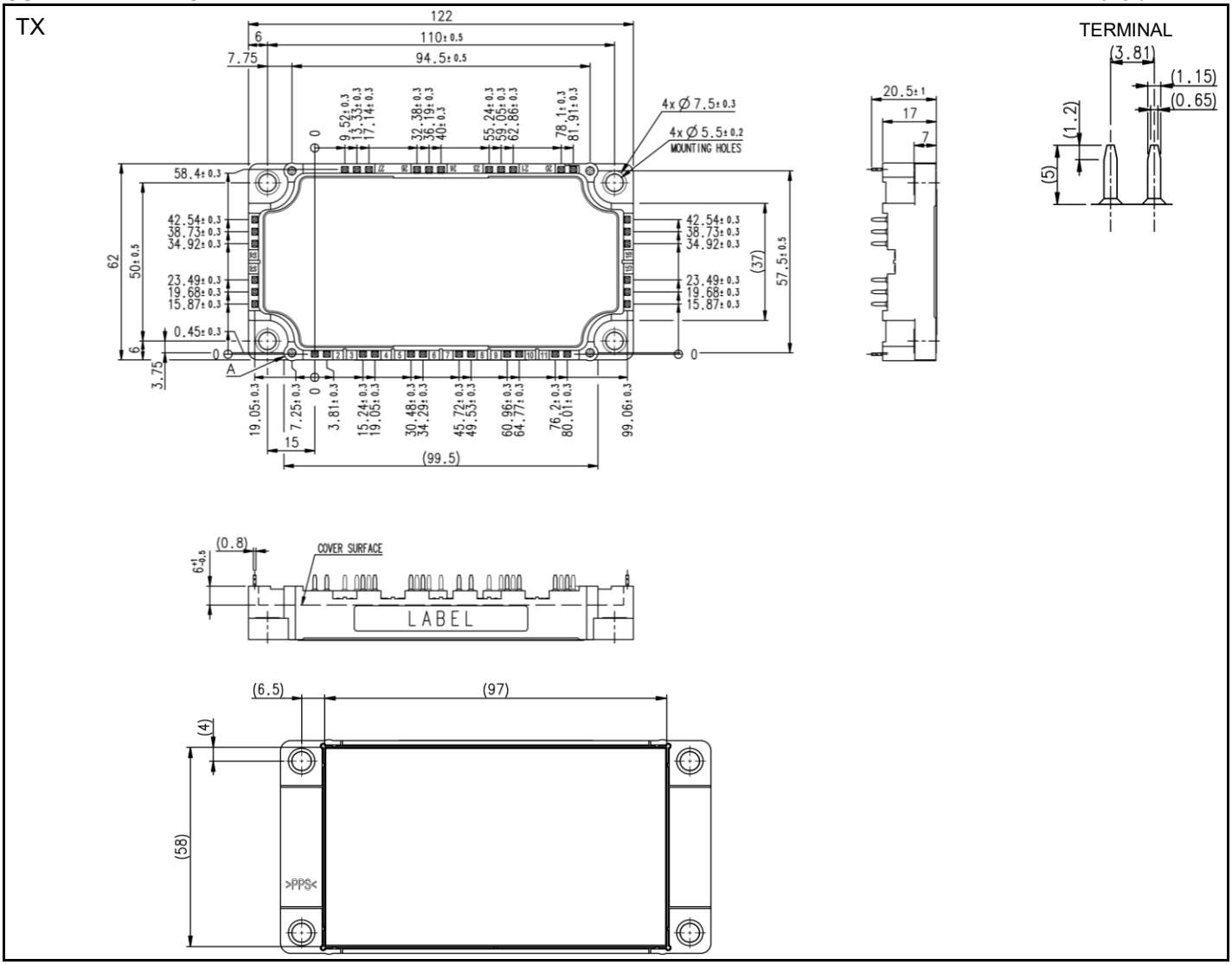
| Division of Dimension | | Tolerance |
|---|---|---|
| 0.5 | to 3 | ±0.2 |
| over 3 | to 6 | ±0.3 |
| over 6 | to 30 | ±0.5 |
| over 30 | to 120 | ±0.8 |
| over 120 | to 400 | ±1.2 |

# CM100TX-24T/CM100TXP-24T

HIGH POWER SWITCHING USE
INSULATED TYPE

**OUTLINE DRAWING** **Dimension in mm**

TX

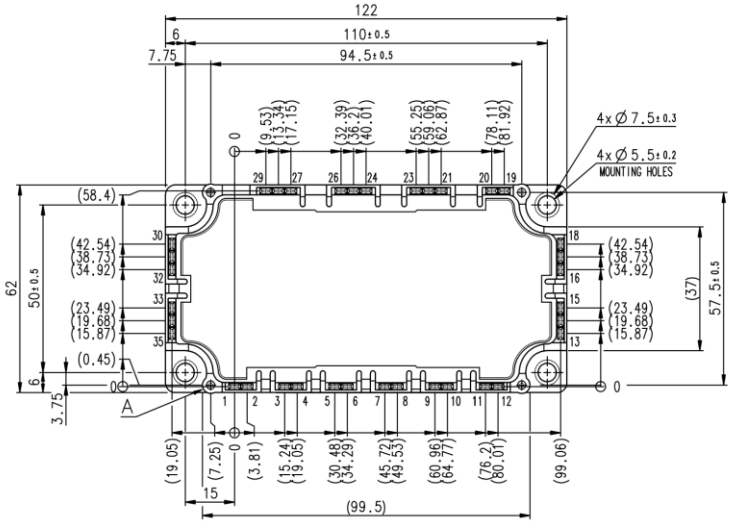


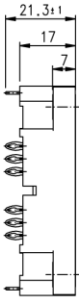
# CM100TX-24T/CM100TXP-24T

HIGH POWER SWITCHING USE
INSULATED TYPE

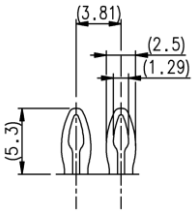
**OUTLINE DRAWING** **Dimension in mm**

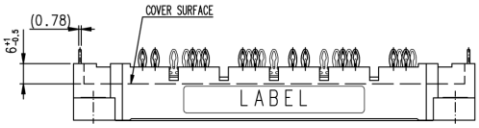
TXP

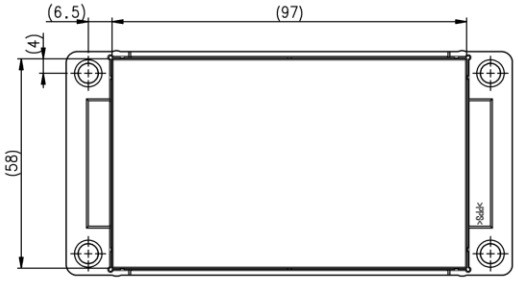


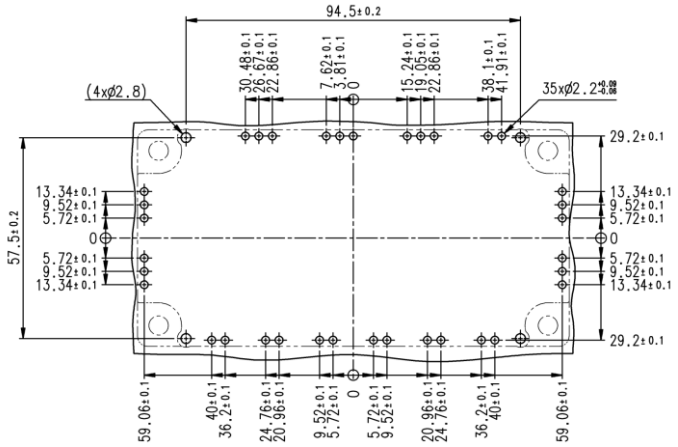

TERMINAL




PCB DRILL HOLE PATTERN



**MAXIMUM RATINGS ($T_{vj}$=25 °C, unless otherwise specified)**

**INVERTER PART IGBT/FWD**

| Symbol | Item | Conditions | Rating | Unit |
|---|---|---|---|---|
| $V_{CES}$ | Collector-emitter voltage | G-E short-circuited | 1200 | V |
| $V_{GES}$ | Gate-emitter voltage | C-E short-circuited | ± 20 | V |
| $I_C$ | Collector current | DC, $T_C$=119 °C (Note2, 4) | 100 | A |
| $I_{CRM}$ | | Pulse, Repetitive (Note3) | 200 | |
| $P_{tot}$ | Total power dissipation | $T_C$=25 °C (Note2, 4) | 565 | W |
| $I_E$ (Note1) | Emitter current | DC (Note2) | 100 | A |
| $I_{ERM}$ (Note1) | | Pulse, Repetitive (Note3) | 200 | |

**MODULE**

| Symbol | Item | Conditions | Rating | Unit |
|---|---|---|---|---|
| $V_{isol}$ | Isolation voltage | Terminals to base plate, RMS, f=60 Hz, AC 1 min | 2500 | V |
| $T_{vjmax}$ | Maximum junction temperature | Instantaneous event (overload) (Note9) | 175 | °C |
| $T_{Cmax}$ | Maximum case temperature | (Note4, 9) | 125 | |
| $T_{vjop}$ | Operating junction temperature | Continuous operation (under switching) (Note9) | -40 ~ +150 | °C |
| $T_{stg}$ | Storage temperature | - | -40 ~ +125 | |

**ELECTRICAL CHARACTERISTICS ($T_{vj}$=25 °C, unless otherwise specified)**

**INVERTER PART IGBT/FWD**

| Symbol | Item | Conditions | | Limits | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| $I_{CES}$ | Collector-emitter cut-off current | $V_{CE}$=$V_{CES}$, G-E short-circuited | | - | - | 1.0 | mA |
| $I_{GES}$ | Gate-emitter leakage current | $V_{GE}$=$V_{GES}$, C-E short-circuited | | - | - | 0.5 | μA |
| $V_{GE(th)}$ | Gate-emitter threshold voltage | $I_C$=10 mA, $V_{CE}$=10 V | | 5.4 | 6.0 | 6.6 | V |
| $V_{CEsat}$ (Terminal) | Collector-emitter saturation voltage | $I_C$=100 A, $V_{GE}$=15 V, Refer to the figure of test circuit (Note5) | $T_{vj}$=25 °C | - | 1.60 | 1.95 | V |
| | | | $T_{vj}$=125 °C | - | 1.80 | - | |
| | | | $T_{vj}$=150 °C | - | 1.85 | - | |
| $V_{CEsat}$ (Chip) | | $I_C$=100 A, $V_{GE}$=15 V, (Note5) | $T_{vj}$=25 °C | - | 1.55 | 1.80 | V |
| | | | $T_{vj}$=125 °C | - | 1.75 | - | |
| | | | $T_{vj}$=150 °C | - | 1.80 | - | |
| $C_{ies}$ | Input capacitance | $V_{CE}$=10 V, G-E short-circuited | | - | - | 22.8 | nF |
| $C_{oes}$ | Output capacitance | | | - | - | 0.8 | |
| $C_{res}$ | Reverse transfer capacitance | | | - | - | 0.3 | |
| $Q_G$ | Gate charge | $V_{CC}$=600 V, $I_C$=100 A, $V_{GE}$=15 V | | - | 0.75 | - | μC |
| $t_{d(on)}$ | Turn-on delay time | $V_{CC}$=600 V, $I_C$=100 A, $V_{GE}$=±15 V, $R_G$=3.9 Ω, Inductive load | | - | - | 400 | ns |
| $t_r$ | Rise time | | | - | - | 200 | |
| $t_{d(off)}$ | Turn-off delay time | | | - | - | 500 | |
| $t_f$ | Fall time | | | - | - | 500 | |
| $V_{EC}$ (Note1) (Terminal) | Emitter-collector voltage | $I_E$=100 A, G-E short-circuited, Refer to the figure of test circuit (Note5) | $T_{vj}$=25 °C | - | 1.50 | 1.95 | V |
| | | | $T_{vj}$=125 °C | - | 1.60 | - | |
| | | | $T_{vj}$=150 °C | - | 1.65 | - | |
| $V_{EC}$ (Note1) (Chip) | | $I_E$=100 A, G-E short-circuited, (Note5) | $T_{vj}$=25 °C | - | 1.45 | 1.75 | V |
| | | | $T_{vj}$=125 °C | - | 1.45 | - | |
| | | | $T_{vj}$=150 °C | - | 1.45 | - | |
| $t_{rr}$ (Note1) | Reverse recovery time | $V_{CC}$=600 V, $I_E$=100 A, $V_{GE}$=±15 V, $R_G$=3.9 Ω, Inductive load | | - | - | 300 | ns |
| $Q_{rr}$ (Note1) | Reverse recovery charge | | | - | 9.4 | - | μC |
| $E_{on}$ | Turn-on switching energy per pulse | $V_{CC}$=600 V, $I_C$=$I_E$=100 A, $V_{GE}$=±15 V, $R_G$=3.9 Ω, $T_{vj}$=150 °C, Inductive load | | - | 9.2 | - | mJ |
| $E_{off}$ | Turn-off switching energy per pulse | | | - | 10.4 | - | |
| $E_{rr}$ (Note1) | Reverse recovery energy per pulse | | | - | 8.2 | - | mJ |
| $R_{CC'+EE'}$ | Internal lead resistance | Main terminals-chip, per switch, $T_C$=25 °C (Note4) | | - | 2.0 | - | mΩ |
| $r_g$ | Internal gate resistance | Per switch | | - | 0 | - | Ω |

**ELECTRICAL CHARACTERISTICS (cont.; $T_{vj}$=25 °C, unless otherwise specified)**

**NTC THERMISTOR PART**

| Symbol | Item | Conditions | Limits | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $R_{25}$ | Zero-power resistance | $T_C$=25 °C (Note4) | 4.85 | 5.00 | 5.15 | kΩ |
| ΔR/R | Deviation of resistance | $R_{100}$=493 Ω, $T_C$=100 °C (Note4) | -7.3 | - | +7.8 | % |
| $B_{(25/50)}$ | B-constant | Approximate by equation (Note6) | - | 3375 | - | K |
| $P_{25}$ | Power dissipation | $T_C$=25 °C (Note4) | - | - | 10 | mW |

**THERMAL RESISTANCE CHARACTERISTICS**

| Symbol | Item | Conditions | Limits | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $R_{th(j-c)Q}$ | Thermal resistance | Junction to case, per Inverter IGBT (Note4) | - | - | 264 | K/kW |
| $R_{th(j-c)D}$ | | Junction to case, per Inverter FWD (Note4) | - | - | 391 | K/kW |
| $R_{th(c-s)}$ | Contact thermal resistance | Case to heat sink, per 1 module, Thermal grease applied (Note4, 7, 9) | - | 11.5 | - | K/kW |

**MECHANICAL CHARACTERISTICS**

| Symbol | Item | Conditions | | Limits | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| $M_s$ | Mounting torque | Mounting to heat sink M 5 screw | | 2.5 | 3.0 | 3.5 | N·m |
| $d_s$ | Creepage distance | Solder pin type (TX) | Terminal to terminal | 16.4 | - | - | mm |
| | | | Terminal to base plate | 18.5 | - | - | |
| | | Pressfit pin type (TXP) | Terminal to terminal | 19 | - | - | mm |
| | | | Terminal to base plate | 18.6 | - | - | |
| $d_a$ | Clearance | Solder pin type (TX) | Terminal to terminal | 10.2 | - | - | mm |
| | | | Terminal to base plate | 9.0 | - | - | |
| | | Pressfit pin type (TXP) | Terminal to terminal | 8.9 | - | - | mm |
| | | | Terminal to base plate | 9.0 | - | - | |
| $e_c$ | Flatness of base plate | On the centerline X, Y (Note8) | | ±0 | - | +200 | μm |
| m | mass | - | | - | 270 | - | g |

*: This product is compliant with the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) directive 2011/65/EU and (EU) 2015/863.

Note1. Represent ratings and characteristics of the anti-parallel, emitter-collector free-wheeling diode (FWD).

2. Junction temperature ($T_{vj}$) should not increase beyond $T_{vjmax}$ rating.

3. Pulse width and repetition rate should be such that the device junction temperature ($T_{vj}$) dose not exceed $T_{vjmax}$ rating.

4. Case temperature ($T_C$) and heat sink temperature ($T_S$) are defined on the each surface (mounting side) of base plate and heat sink just under the chips. Refer to the figure of chip location.

5. Pulse width and repetition rate should be such as to cause negligible temperature rise. Refer to the figure of test circuit.

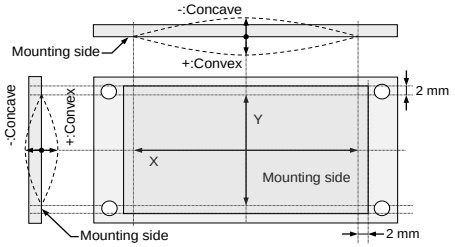
6. $B_{(25/50)} = \ln(\frac{R_{25}}{R_{50}})/(\frac{1}{T_{25}} - \frac{1}{T_{50}})$

   $R_{25}$: resistance at absolute temperature $T_{25}$ [K]; $T_{25}$=25 [°C]+273.15=298.15 [K]

   $R_{50}$: resistance at absolute temperature $T_{50}$ [K]; $T_{50}$=50 [°C]+273.15=323.15 [K]

7. Reference value. Thermally conductive grease of thermal conductivity λ=0.9 W/(m·K) and thickness $D_{(C-S)}$=50 μm.

8. The base plate (mounting side) flatness measurement points (X, Y) are shown in the following figure.




9. Long term performance related to thermal conductive grease (including but not limited to aspects such as the increase of thermal resistance due to pumping out, etc.) should be verified under user's specific application conditions. Each temperature condition ($T_{vj\,max}$, $T_{vj\,op}$, $T_{C\,max}$) must be maintained below the maximum rated temperature throughout consideration of the temperature rise even for long term usage.

Note10. Use the following screws when mounting the printed circuit board (PCB) on the standoffs.
PCB thickness : t1.6.

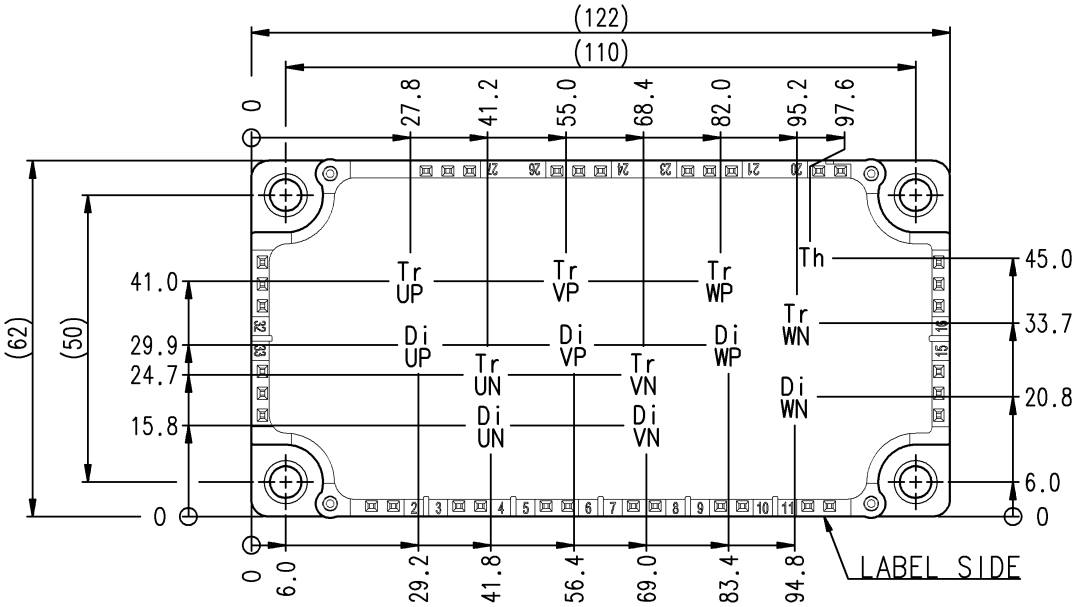
| Type | Manufacturer | Size | Tightening torque (N・m) | Recommended tightening method |
|---|---|---|---|---|
| (1) PT® | EJOT | K25×8 | 0.55 ± 0.055 | by handwork (equivalent to 30 rpm by mechanical screw driver) ~ 600 rpm (by mechanical screw driver) |
| (2) PT® | | K25×10 | 0.75 ± 0.075 N・m | |
| (3) DELTA PT® | | 25×8 | 0.55 ± 0.055 N・m | |
| (4) DELTA PT® | | 25×10 | 0.75 ± 0.075 N・m | |
| (5) B1 tapping screw | - | φ2.6×10 | 0.75 ± 0.075 N・m | |
| | | φ2.6×12 | | |

**RECOMMENDED OPERATING CONDITIONS**

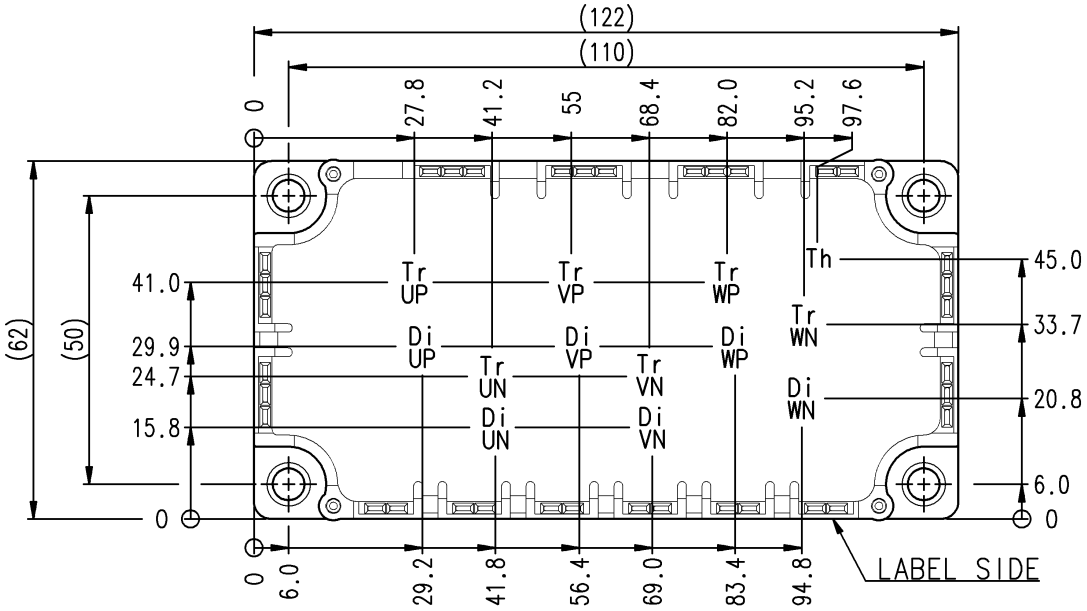
| Symbol | Item | Conditions | Limits | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $V_{CC}$ | (DC) Supply voltage | Applied across P-N terminals | - | 600 | 850 | V |
| $V_{GEon}$ | Gate (-emitter drive) voltage | Applied across G*P-E*P/G*N-E*N terminals (*=U,V,W) | 13.5 | 15.0 | 16.5 | V |
| $R_G$ | External gate resistance | Per switch | 3.9 | - | 39 | Ω |

**CHIP LOCATION (Top view)** Dimension in mm, tolerance: ±1 mm

TX

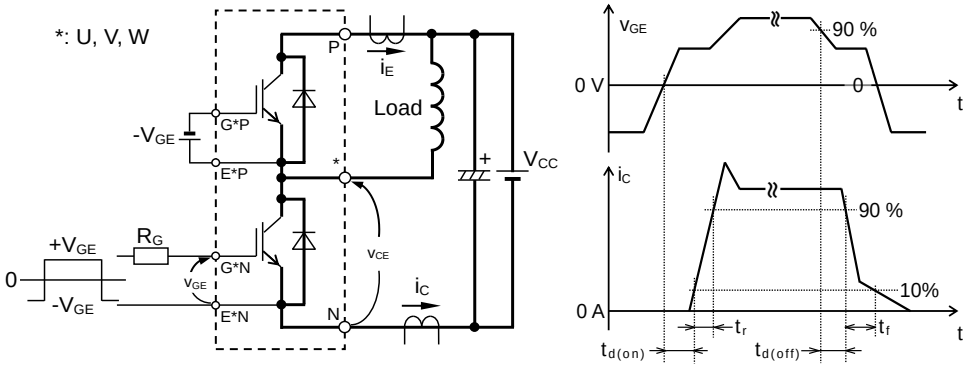



TXP

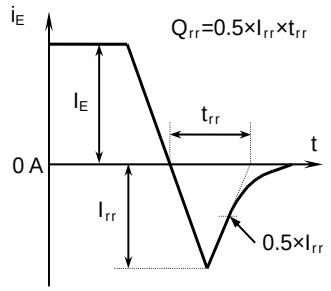



Tr*P/Tr*N: IGBT, Di*P/Di*N: FWD (*=U,V,W), Th: NTC thermistor

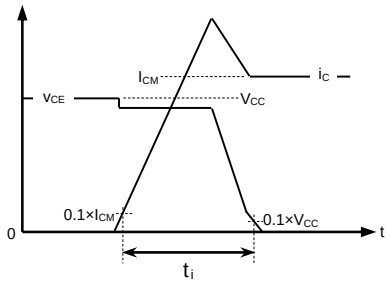
**TEST CIRCUIT AND WAVEFORMS**



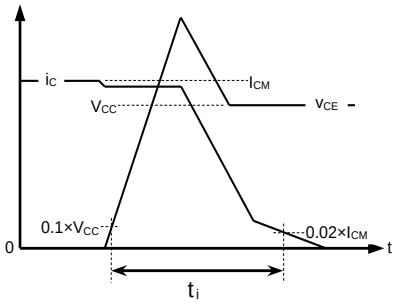

Switching characteristics test circuit and waveforms



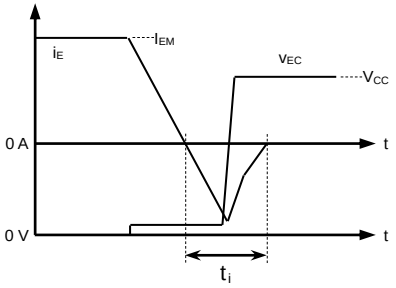

$t_{rr}$, $Q_{rr}$ characteristics test waveform




IGBT Turn-on switching energy



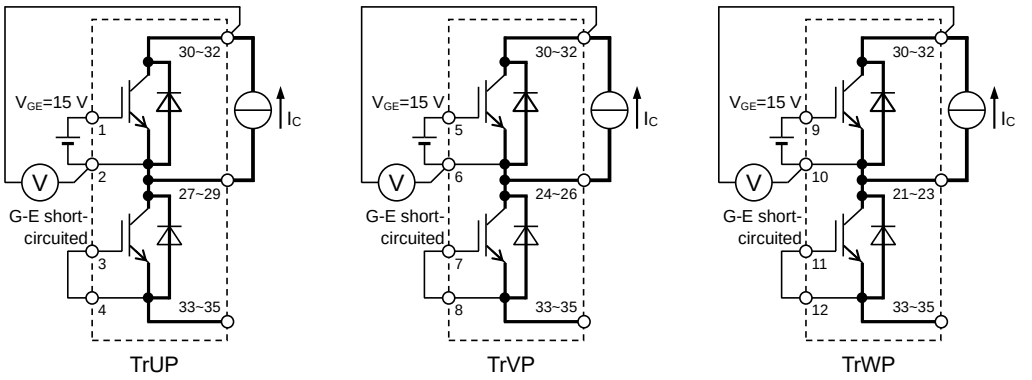

IGBT Turn-off switching energy

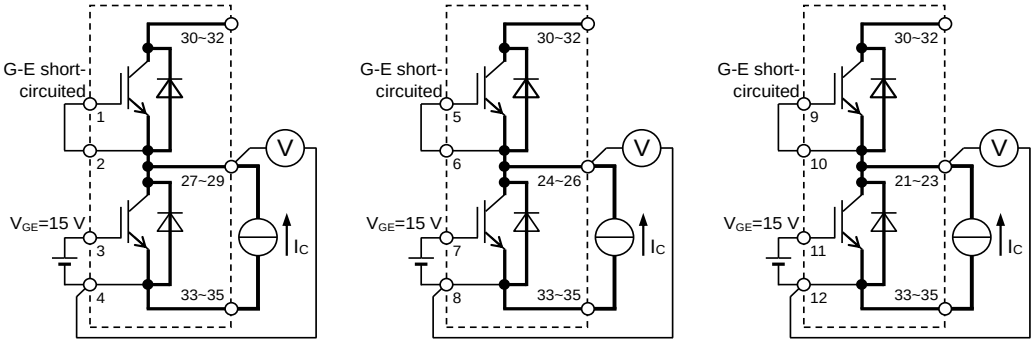



FWD Reverse recovery energy

Switching energy and Reverse recovery energy test waveforms (Integral time instruction drawing)

**TEST CIRCUIT**



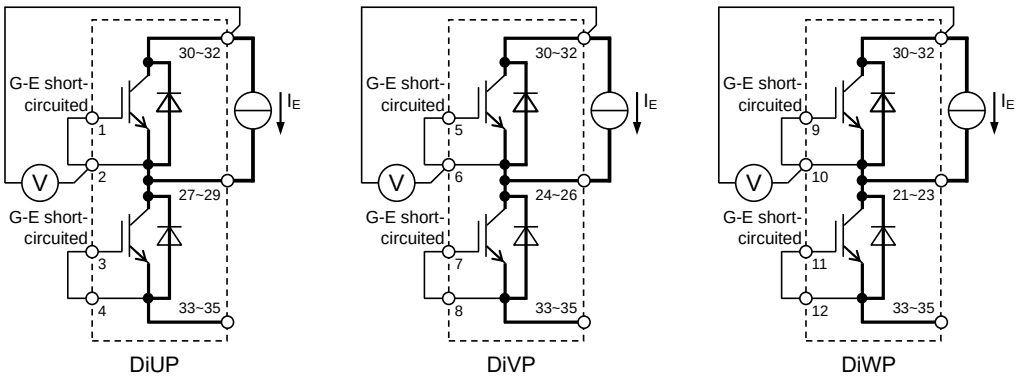



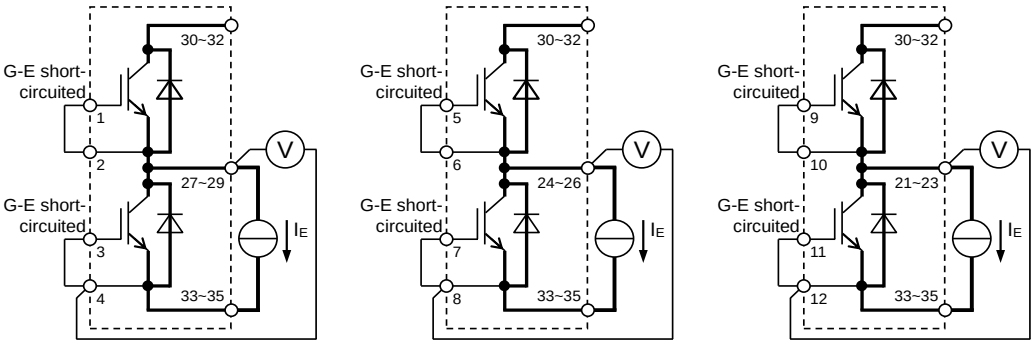

Gate-emitter short-circuited: GVP-EVP, GVN-EVN, GWP-EWP, GWN-EWN

Gate-emitter short-circuited: GUP-EUP, GUN-EUN, GWP-EWP, GWN-EWN

Gate-emitter short-circuited: GUP-EUP, GUN-EUN, GVP-EVP, GVN-EVN

$V_{CEsat}$ characteristics test circuit




Gate-emitter short-circuited: GVP-EVP, GVN-EVN, GWP-EWP, GWN-EWN

Gate-emitter short-circuited: GUP-EUP, GUN-EUN, GWP-EWP, GWN-EWN

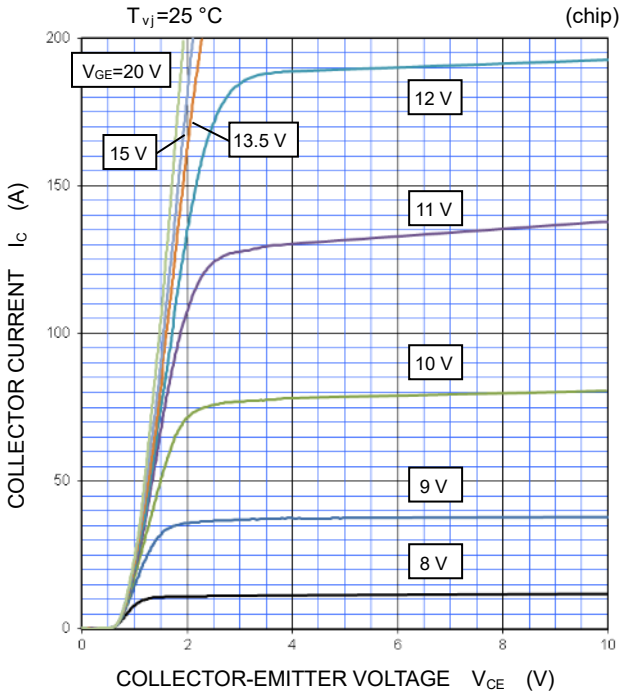
Gate-emitter short-circuited: GUP-EUP, GUN-EUN, GVP-EVP, GVN-EVN

$V_{EC}$ characteristics test circuit

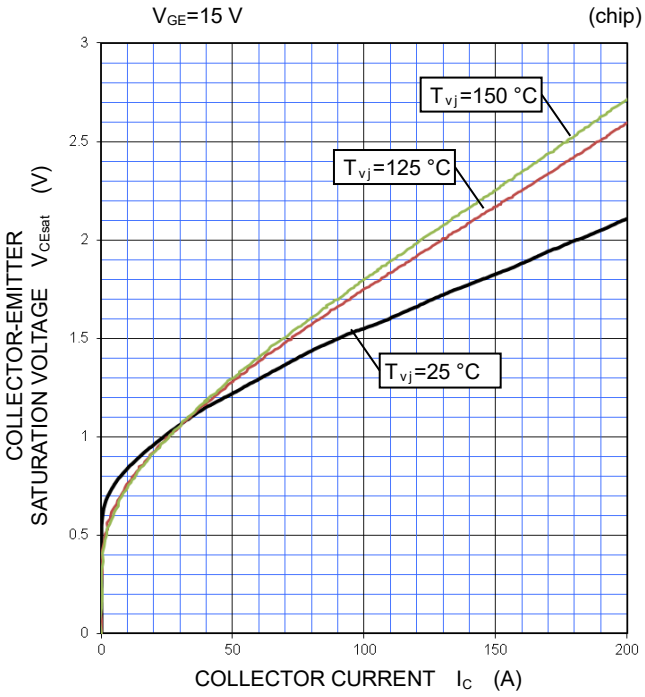
## PERFORMANCE CURVES

### INVERTER PART

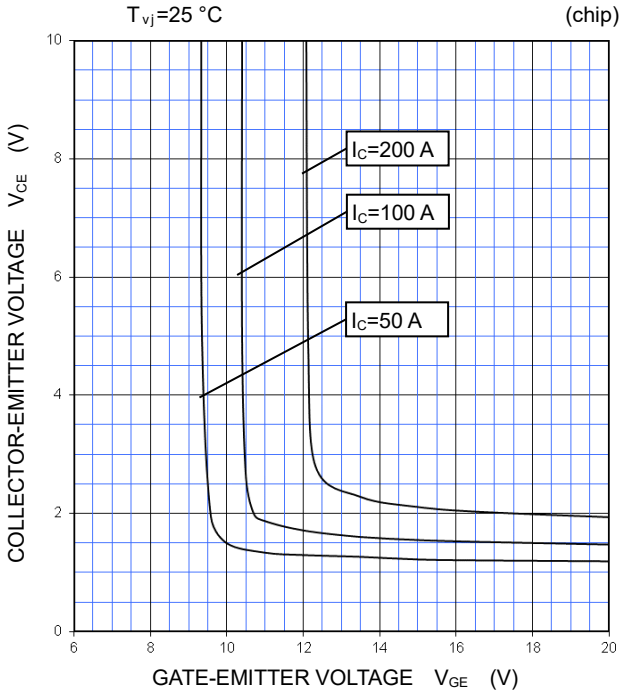
**OUTPUT CHARACTERISTICS (TYPICAL)**



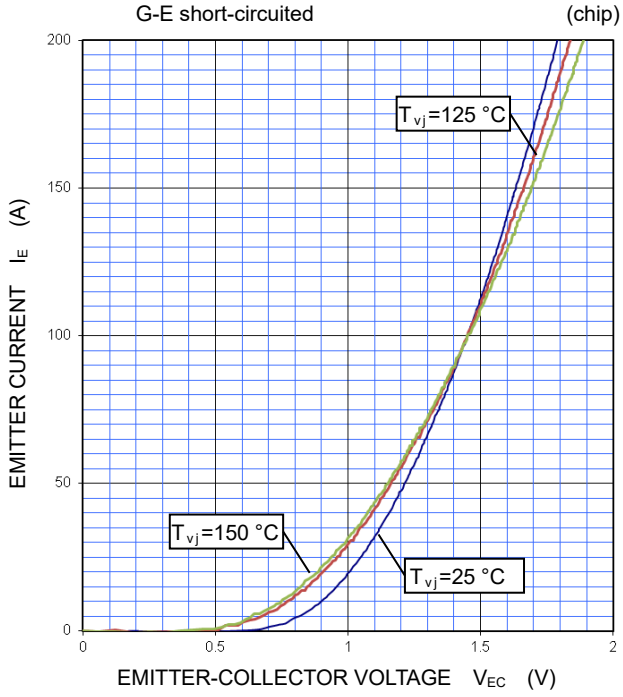

**COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)**




**COLLECTOR-EMITTER VOLTAGE CHARACTERISTICS (TYPICAL)**




**FREE WHEELING DIODE FORWARD CHARACTERISTICS (TYPICAL)**

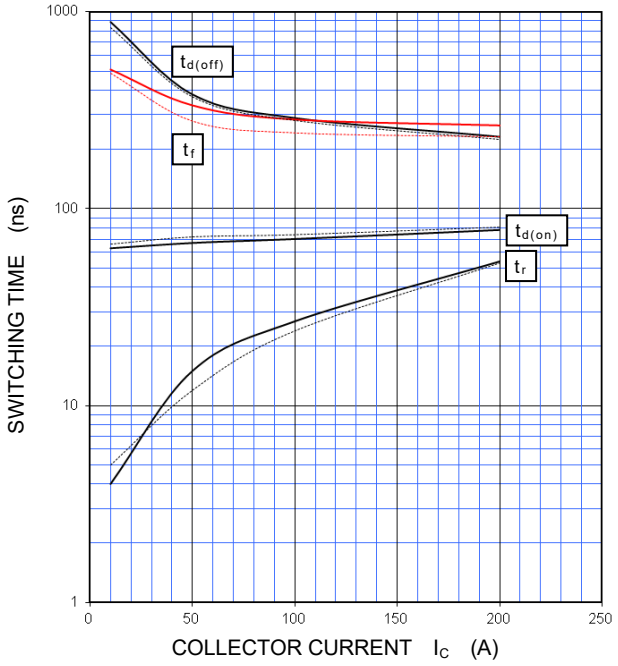


## PERFORMANCE CURVES

### INVERTER PART

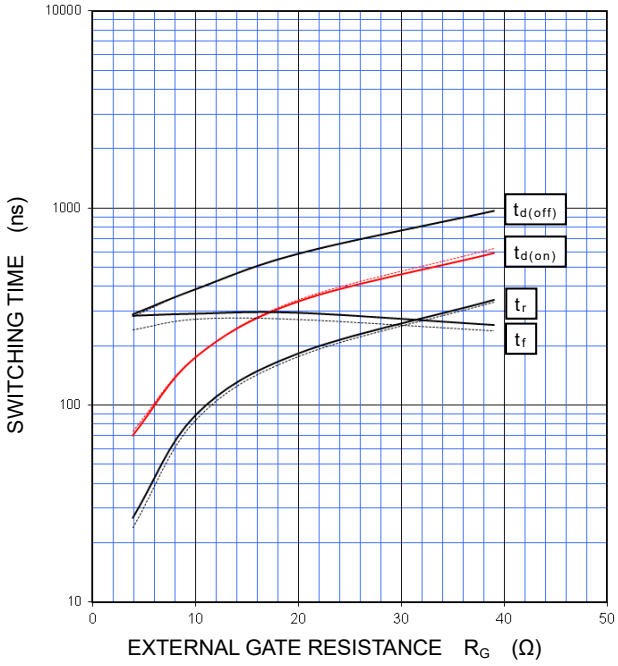
**HALF-BRIDGE SWITCHING CHARACTERISTICS (TYPICAL)**

$V_{CC}$=600 V, $R_G$=3.9 Ω, $V_{GE}$=±15 V, INDUCTIVE LOAD
——————: $T_{vj}$=150 °C, - - - - -: $T_{vj}$=125 °C



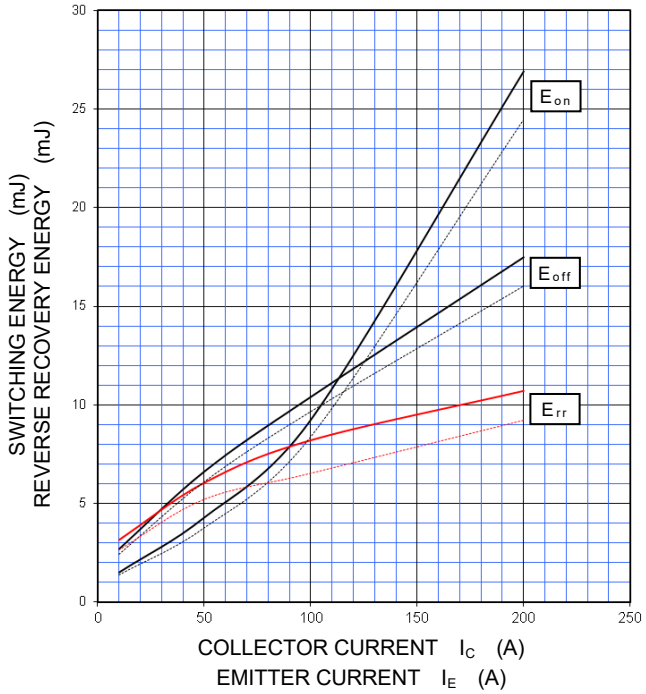

**HALF-BRIDGE SWITCHING CHARACTERISTICS (TYPICAL)**

$V_{CC}$=600 V, $I_C$=100 A, $V_{GE}$=±15 V, INDUCTIVE LOAD
——————: $T_{vj}$=150 °C, - - - - -: $T_{vj}$=125 °C



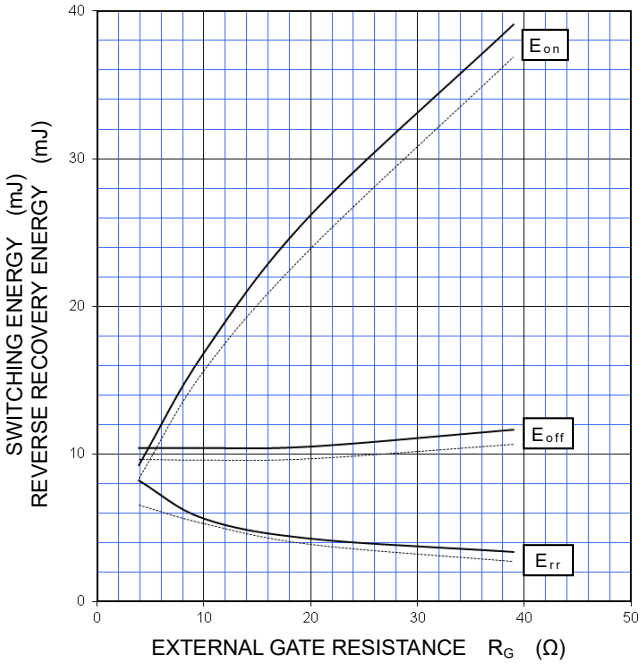

**HALF-BRIDGE SWITCHING CHARACTERISTICS (TYPICAL)**

$V_{CC}$=600 V, $R_G$=3.9 Ω, $V_{GE}$=±15 V, INDUCTIVE LOAD,
——————: $T_{vj}$=150 °C, - - - - -: $T_{vj}$=125 °C, PER PULSE




**HALF-BRIDGE SWITCHING CHARACTERISTICS (TYPICAL)**

$V_{CC}$=600 V, $I_C$/$I_E$=100 A, $V_{GE}$=±15 V, INDUCTIVE LOAD,
——————: $T_{vj}$=150 °C, - - - - -: $T_{vj}$=125 °C, PER PULSE

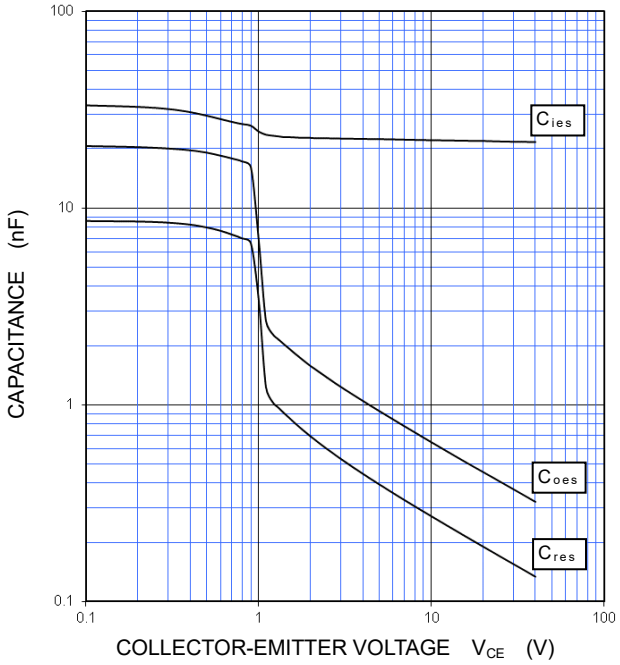


## PERFORMANCE CURVES

### INVERTER PART

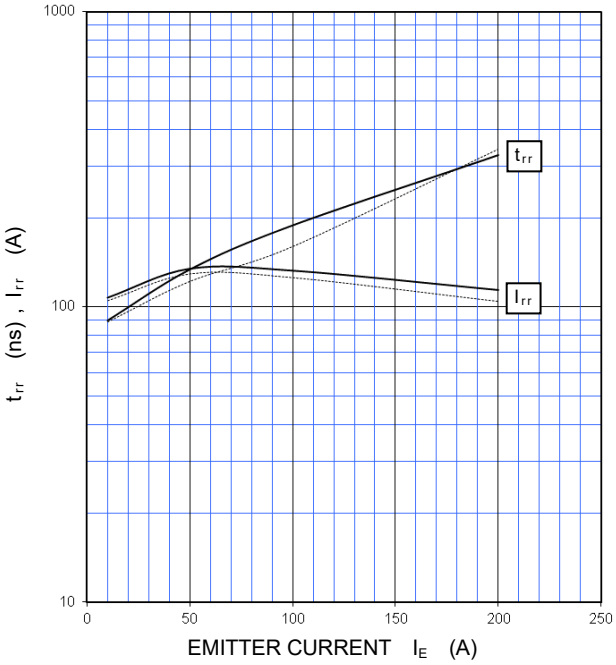
**CAPACITANCE CHARACTERISTICS (TYPICAL)**

G-E short-circuited, $T_{vj}$=25 °C



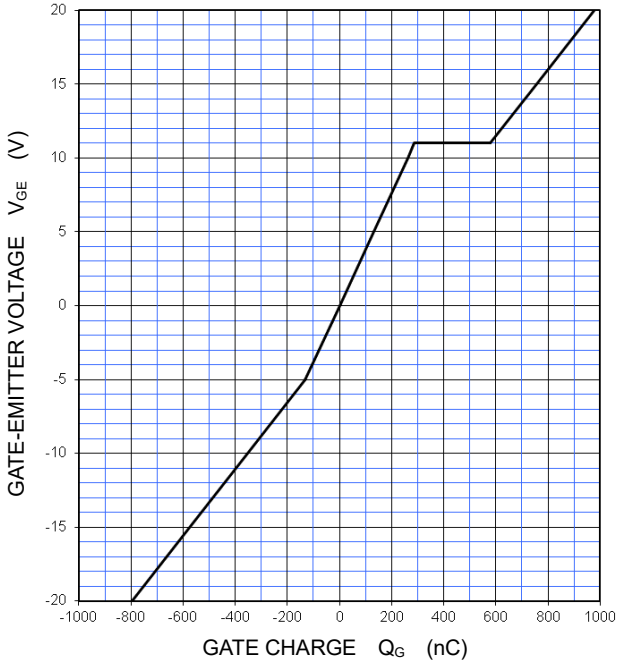

**FREE WHEELING DIODE REVERSE RECOVERY CHARACTERISTICS (TYPICAL)**

$V_{CC}$=600 V, $R_G$=3.9 Ω, $V_{GE}$=±15 V, INDUCTIVE LOAD
————: $T_j$=150 °C, - - - - -: $T_j$=125 °C



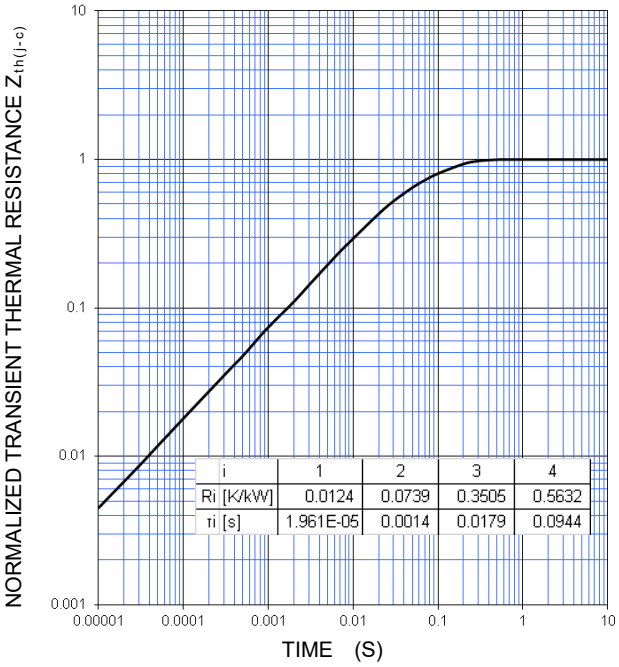

**GATE CHARGE CHARACTERISTICS (TYPICAL)**

$V_{CC}$=600 V, $I_C$=100 A, $T_{vj}$=25 °C




**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (MAXIMUM)**

Single pulse, $T_C$=25 °C
$R_{th(j-c)Q}$=264 K/kW, $R_{th(j-c)D}$=391 K/kW



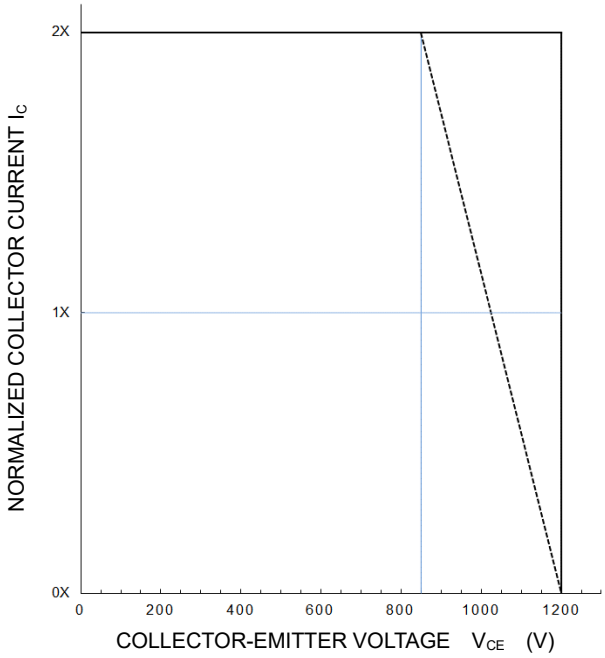

| i | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Ri [K/kW] | 0.0124 | 0.0739 | 0.3505 | 0.5632 |
| τi [s] | 1.961E-05 | 0.0014 | 0.0179 | 0.0944 |

## PERFORMANCE CURVES

### INVERTER PART

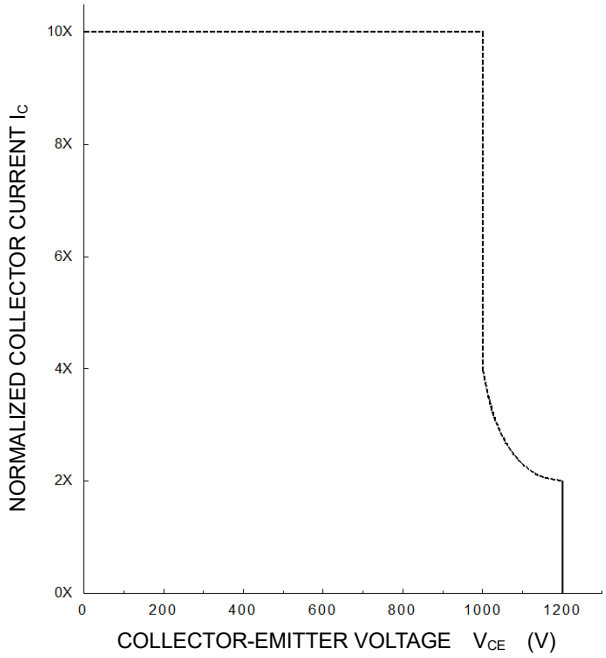
**TURN-OFF SWITCHING SAFE OPERATIONG AREA (REVERSE BIAS SAFE OPERATING AREA) (MAXIMUM)**

$V_{CC}$≤850 V, $R_G$=3.9~39 Ω, $V_{GE}$=±15 V,
————: $T_{vj}$=25~150 °C (Normal load operations (Continuous)
- - - - - -: $T_{vj}$=175 °C (Unusual load operations (Limited period)



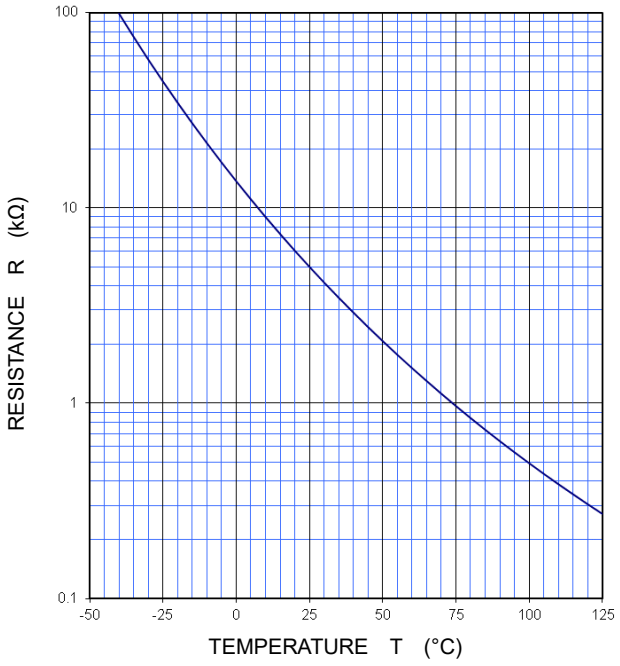

**SHORT-CIRCUIT SAFE OPERATING AREA (MAXIMUM)**

$V_{CC}$≤800 V, $R_G$=3.9~39 Ω, $V_{GE}$=±15 V,
$T_{vj}$= 25 ~ 150 °C, $t_W$≤8 μs, Non-Repetitive




### NTC thermistor part

**TEMPERATURE CHARACTERISTICS (TYPICAL)**




Note: The characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

## Important Notice

The information contained in this datasheet shall in no event be regarded as a guarantee of conditions or characteristics. This product has to be used within its specified maximum ratings, and is subject to customer's compliance with any applicable legal requirement, norms and standards.

Except as otherwise explicitly approved by Mitsubishi Electric Corporation in a written document signed by authorized representatives of Mitsubishi Electric Corporation, our products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.

In usage of power semiconductor, there is always the possibility that trouble may occur with them by the reliability lifetime such as Power Cycle, Thermal Cycle or others, or when used under special circumstances (e.g. condensation, high humidity, dusty, salty, highlands, environment with lots of organic matter / corrosive gas / explosive gas, or situations which terminals of semiconductor products receive strong mechanical stress). Therefore, please pay sufficient attention to such circumstances. Further, depending on the technical requirements, our semiconductor products may contain environmental regulation substances, etc. If there is necessity of detailed confirmation, please contact our nearest sales branch or distributor.

The contents or data contained in this datasheet are exclusively intended for technically trained staff. Customer's technical departments should take responsibility to evaluate the suitability of Mitsubishi Electric Corporation product for the intended application and the completeness of the product data with respect to such application. In the customer's research and development, please evaluate it not only with a single semiconductor product but also in the entire system, and judge whether it's applicable. As required, pay close attention to the safety design by installing appropriate fuse or circuit breaker between a power supply and semiconductor products to prevent secondary damage. Please also pay attention to the application note and the related technical information.

## Keep safety first in your circuit designs!

Mitsubishi Electric Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage. Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of non-flammable material or (iii) prevention against any malfunction or mishap.

## Notes regarding these materials

- These materials are intended as a reference to assist our customers in the selection of the Mitsubishi Electric Semiconductor product best suited to the customer's application; they do not convey any license under any intellectual property rights, or any other rights, belonging to Mitsubishi Electric Corporation or a third party.
- Mitsubishi Electric Corporation assumes no responsibility for any damage, or infringement of any third-party's rights, originating in the use of any product data, diagrams, charts, programs, algorithms, or circuit application examples contained in these materials.
- All information contained in these materials, including product data, diagrams, charts, programs and algorithms represents information on products at the time of publication of these materials, and are subject to change by Mitsubishi Electric Corporation without notice due to product improvements or other reasons. It is therefore recommended that customers contact Mitsubishi Electric Corporation or an authorized Mitsubishi Electric Semiconductor product distributor for the latest product information before purchasing a product listed herein.
  The information described here may contain technical inaccuracies or typographical errors. Mitsubishi Electric Corporation assumes no responsibility for any damage, liability, or other loss rising from these inaccuracies or errors.
  Please also pay attention to information published by Mitsubishi Electric Corporation by various means, including the Mitsubishi Electric Semiconductor home page (http://www.MitsubishiElectric.com/semiconductor/).
- When using any or all of the information contained in these materials, including product data, diagrams, charts, programs, and algorithms, please be sure to evaluate all information as a total system before making a final decision on the applicability of the information and products. Mitsubishi Electric Corporation assumes no responsibility for any damage, liability or other loss resulting from the information contained herein.
- Mitsubishi Electric Corporation semiconductors are not designed or manufactured for use in a device or system that is used under circumstances in which human life is potentially at stake. Please contact Mitsubishi Electric Corporation or an authorized Mitsubishi Electric Semiconductor product distributor when considering the use of a product contained herein for any specific purposes, such as apparatus or systems for transportation, vehicular, medical, aerospace, nuclear, or undersea repeater use.
- The prior written approval of Mitsubishi Electric Corporation is necessary to reprint or reproduce in whole or in part these materials.
- If these products or technologies are subject to the Japanese export control restrictions, they must be exported under a license from the Japanese government and cannot be imported into a country other than the approved destination.
  Any diversion or re-export contrary to the export control laws and regulations of Japan and/or the country of destination is prohibited.
- Please contact Mitsubishi Electric Corporation or an authorized Mitsubishi Electric Semiconductor product distributor for further details on these materials or the products contained therein.