## 1200V 75A Trench and Field Stop IGBT

DESCRIPTION：
- High ruggedness performance
- Low collector to emitter saturation voltage
- Easy parallel switching capability
- Short circuit withstands time 10μs
- RoHS compliant.

TYPICAL APPLICATIONS：
- Inverter
- Servo drive


TO-247PLUS

### IGBT

MAXIMUM RATINGS (Tvj=25℃ unless otherwise specified)

| Characteristic | Condition | Symbol | Value | Unit |
|---|---|---|---|---|
| Collector-Emitter Voltage | | $V_{CES}$ | 1200 | V |
| Continuous collector current | Tc=25℃<br>Tc=100℃ | $I_C$ | 150<br>75 | A |
| Pulsed collector current | $t_P$ limited by Tvjmax | $I_{CM}$ | 300 | A |
| Gate emitter voltage | | $V_{GES}$ | ±20 | V |
| Power dissipation | Tc=25℃<br>Tc=100℃ | $P_{tot}$ | 882<br>441 | W |
| Operating junction temperature range | | Tvj | -40~+175 | ℃ |
| Storage temperature | | $T_{STG}$ | -55~+150 | ℃ |

THERMAL CHARACTERISTICS

| Characteristic | Condition | Symbol | Max. | Unit |
|---|---|---|---|---|
| IGBT thermal resistance, junction - case | | $R_{th(j-C)}$ | 0.17 | K/W |
| Diode thermal resistance, junction - case | | $R_{th(j-C)}$ | 0.35 | K/W |
| Thermal resistance, junction - ambient | | $R_{th(j-A)}$ | 40 | K/W |

ELECTRICAL CHARATERISTICS

| Characteristic | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Collector-emitter breakdown voltage<br>VGE=0V, IC=250uA Tvj=25℃ | $BV_{CES}$ | 1200 | | | V |
| Collector-emitter cut-off current<br>VCE=1200V, VGE=0V Tvj=25℃ | $I_{CES}$ | | | 100 | uA |
| Gate-emitter leakage current<br>VCE=0V, VGE=±20V Tvj=25℃ | $I_{GES}$ | | | ±100 | nA |
| Gate-Emitter threshold voltage<br>IC=1.0mA, VGE= VCE Tvj=25℃ | $V_{GE(th)}$ | 5.0 | 5.5 | 6.0 | V |
| Collector-Emitter saturation voltage<br>VGE=15V, IC=75A Tvj=25℃<br>VGE=15V, IC=75A Tvj=175℃ | $V_{CE(SAT)}$ | | 1.7<br>2.2 | | V |
| Input capacitance<br>f=1MHz, VCE=30 V, VGE=0 V Tvj=25℃ | $C_{ies}$ | | 6800 | | pF |
| Output capacitance<br>f=1MHz, VCE=30 V, VGE=0 V Tvj=25℃ | $C_{oes}$ | | 350 | | pF |
| Reverse transfer capacitance<br>f=1MHz, VCE=30 V, VGE=0 V Tvj=25℃ | $C_{res}$ | | 60 | | pF |
| Gate charge<br>IC = 75A, VGE = 15 V,VCC =960V Tvj=25℃ | $Q_G$ | | 420 | | nC |
| Turn-on delay time<br>IC=75A, VCC=600 V Tvj=25℃<br>VGE=0/15 V, RG=10Ω Tvj=175℃<br>(inductive load) | $td_{(ON)}$ | | 86<br>84 | | ns |
| Rise time<br>IC=75A, VCC=600 V Tvj=25℃<br>VGE=0/15 V, RG=10Ω Tvj=175℃<br>(inductive load) | tr | | 186<br>194 | | ns |
| Turn-off delay time<br>IC=75A, VCC=600 V Tvj=25℃<br>VGE=0/15 V, RG=10Ω Tvj=175℃<br>(inductive load) | $td_{(OFF)}$ | | 520<br>580 | | ns |
| Fall time<br>IC=75A, VCC=600 V Tvj=25℃<br>VGE=0/15 V, RG=10Ω Tvj=175℃<br>(inductive load) | tf | | 84<br>63 | | ns |

| | | | | | |
|---|---|---|---|---|---|
| Turn-on energy<br>IC=75A, VCC=600 V Tvj=25℃<br>VGE=0/15 V, RG=10Ω Tvj=175℃<br>(inductive load) | $E_{(ON)}$ | | 11.9<br>17.5 | | mJ |
| Turn-off energy loss per pulse<br>IC=75A, VCC=600 V Tvj=25℃<br>VGE=0/15 V, RG=10Ω Tvj=175℃<br>(inductive load) | $E_{(OFF)}$ | | 4.7<br>6.8 | | mJ |

## Diode

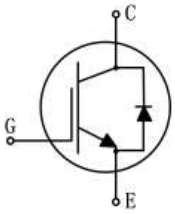
MAXIMUM RATINGS (Tvj=25℃ unless otherwise specified)

| Characteristic | Condition | Symbol | Value | Unit |
|---|---|---|---|---|
| Continuous forward current | Tc=100℃ | $I_F$ | 75 | A |
| Diode maximum current | $t_P$ limited by Tvj max | $I_{FM}$ | 150 | A |

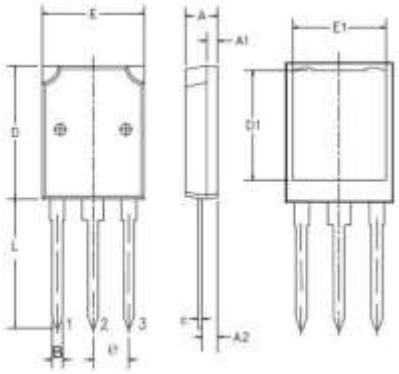
ELECTRICAL CHARATERISTICS

| Characteristic | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Forward voltage<br>IF=75A, Tvj=25℃<br>IF=75A, Tvj=175℃ | $V_F$ | | 1.8<br>1.5 | | V |
| Reverse Recovered Time<br>IF=75 A, Tvj=25℃<br>-diF/dt =200A/μs Tvj=175℃<br>VR=600 V | $T_{rr}$ | | 364<br>576 | | ns |
| Peak reverse recovery current<br>IF=75 A, Tvj=25℃<br>-diF/dt =200A/μs Tvj=175℃<br>VR=600 V | $I_{RRM}$ | | 11<br>23 | | A |
| Reverse Recovered charge<br>IF=75 A, Tvj=25℃<br>-diF/dt =200A/μs Tvj=175℃<br>VR=600 V | $Q_{rr}$ | | 2300<br>8300 | | nC |

• Circuit diagram




• Package outlines : Dimensions in (mm)




| Ref. | Min.(mm) | Typ.(mm) | Max.(mm) |
|---|---|---|---|
| A | 4.92 | 5.00 | 5.08 |
| A1 | 2.27 | 2.35 | 2.43 |
| A2 | 1.92 | 2.00 | 2.08 |
| B | 1.16 | 1.20 | 1.24 |
| C | 0.58 | 0.60 | 0.62 |
| D | 20.80 | 20.90 | 21.00 |
| E | 15.80 | 15.90 | 16.00 |
| E1 | 13.94 | 14.02 | 14.10 |
| e | 5.34 | 5.44 | 5.54 |
| L | 19.80 | 20.00 | 20.20 |