

1200V 75A Trench and Field Stop IGBT

JJT75N120HA

:

- $V_{CE}=1200V$
- $I_C=75A@T_C=100$
- $V_{CE(sat)}=2.0V$

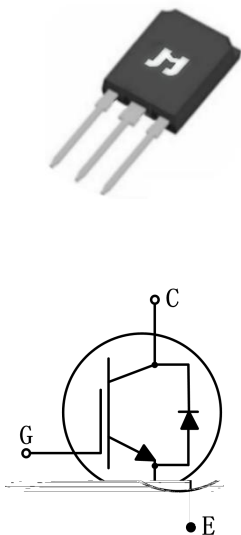
:

- Trench and field-stop technology
- Easy parallel switching capability
- Low  $V_{CEsat}$
- High ruggedness performance
- RoHS compliant

A :

- Solar converters
- On-Board Charger

TO-247PLUS



| Type        | Marking  | Package    | Packaging Method |
|-------------|----------|------------|------------------|
| JJT75N120HA | T75120HA | TO-247PLUS | Tube             |



|           |                                                              |             |   |
|-----------|--------------------------------------------------------------|-------------|---|
| $V_{CES}$ | Collector-emitter voltage                                    | 1200        | V |
| $V_{GES}$ | Gate-emitter voltage                                         | $\pm 20$    | V |
| $I_C$     | Continuous collector current ( $T_C=25^\circ\text{C}$ )      | 150         | A |
|           | Continuous collector current ( $T_C=100^\circ\text{C}$ )     | 75          | A |
| $I_{CM}$  | Pulsed collector current, $t_p$ limited by $T_{vjmax}$       | 300         | A |
| $I_F$     | Diode continuous forward current ( $T_C=100^\circ\text{C}$ ) | 75          | A |
| $I_{FM}$  | Diode maximum current, $t_p$ limited by $T_{vjmax}$          | 150         | A |
| $P_{tot}$ | Power dissipation ( $T_C=25^\circ\text{C}$ )                 | 938         | W |
|           | Power dissipation ( $T_C=100^\circ\text{C}$ )                | 469         | W |
| $T_{vj}$  | Operating junction temperature range                         | -40 to +175 |   |
| $T_{stg}$ | Storage temperature rana                                     |             |   |

**B** ( $T_{vj}=25$  unless otherwise specified)

## Static characteristics

|               |                                      |                                   | .    | .   | .    |    |
|---------------|--------------------------------------|-----------------------------------|------|-----|------|----|
| $BV_{CES}$    | Collector-emitter breakdown voltage  | $V_{GE}=0V, I_C=250\text{ A}$     | 1200 | -   | -    | V  |
| $I_{CES}$     | Collector-emitter leakage current    | $V_{CE}=1200V, V_{GE}=0V$         | -    | -   | 100  | A  |
| $I_{GES}$     | Gate leakage current, forward        | $V_{GE}=20V, V_{CE}=0V$           | -    | -   | 100  | nA |
|               | Gate leakage current, reverse        | $V_{GE}=-20V, V_{CE}=0V$          | -    | -   | -100 | nA |
| $V_{GE(th)}$  | Gate-emitter threshold voltage       | $V_{GE}=V_{CE}, I_C=1mA$          | 5.2  | 5.6 | 6.0  | V  |
| $V_{CE(sat)}$ | Collector-emitter saturation voltage | $V_{GE}=15\text{ V}, I_C=75A$     | -    | 2.0 | -    | V  |
|               |                                      | $V_{GE}=15V, I_C=75A, T_{vj}=175$ | -    | 2.6 | -    | V  |

## Dynamic characteristics

|           |                              |                                            | . | .     | . |    |
|-----------|------------------------------|--------------------------------------------|---|-------|---|----|
| $C_{ies}$ | Input capacitance            | $V_{CE}=30V$<br>$V_{GE}=0V$<br>$f=1MHz$    | - | 18650 | - | pF |
| $C_{oes}$ | Output capacitance           |                                            | - | 340   | - | pF |
| $C_{res}$ | Reverse transfer capacitance |                                            | - | 80    | - | pF |
| $Q_g$     | Total gate charge            | $V_{CC}=960V$<br>$V_{GE}=15V$<br>$I_C=75A$ | - | 560   | - | nC |



(T<sub>vj</sub>=25 unless otherwise specified)

|           |                                     |                                                             | . | .    | . |    |
|-----------|-------------------------------------|-------------------------------------------------------------|---|------|---|----|
| $V_F$     | Diode forward voltage               | $I_F=75A$                                                   | - | 2.1  | - | V  |
|           |                                     | $I_F=75A$ $T_{vj}=175$                                      | - | 1.8  | - | V  |
| $t_{rr}$  | Diode reverse recovery time         | $V_R=600V$<br>$I_F=75A$<br>$di_F/dt=-600A/$                 | - | 163  | - | ns |
| $I_{rrm}$ | Diode peak reverse recovery current |                                                             | - | 20   | - | A  |
| $Q_{rr}$  | Diode reverse recovery charge       |                                                             | - | 2046 | - | nC |
| $t_{rr}$  | Diode reverse recovery time         | $V_R=600V$<br>$I_F=75A$<br>$di_F/dt=-600A/$<br>$T_{vj}=175$ | - | 278  | - | ns |
| $I_{rrm}$ | Diode peak reverse recovery current |                                                             | - | 39   | - | A  |
| $Q_{rr}$  | Diode reverse recovery charge       |                                                             | - | 6679 | - | nC |

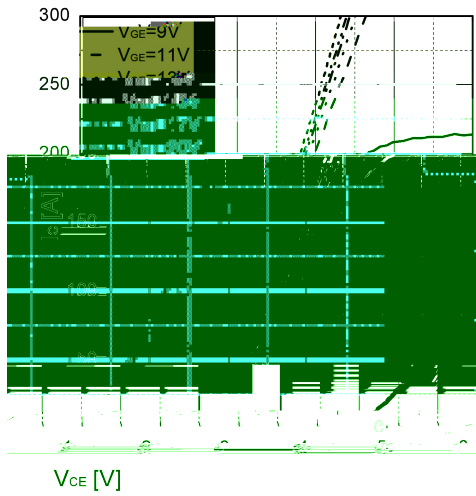
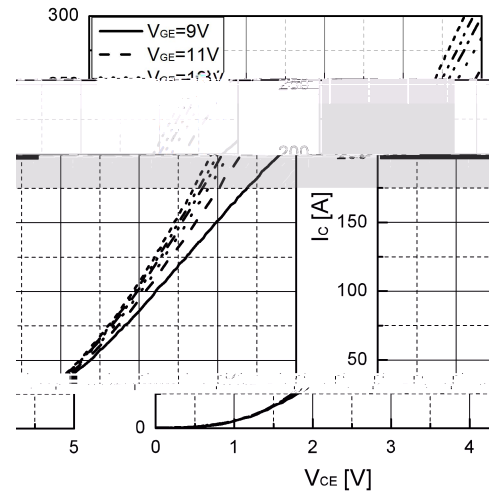
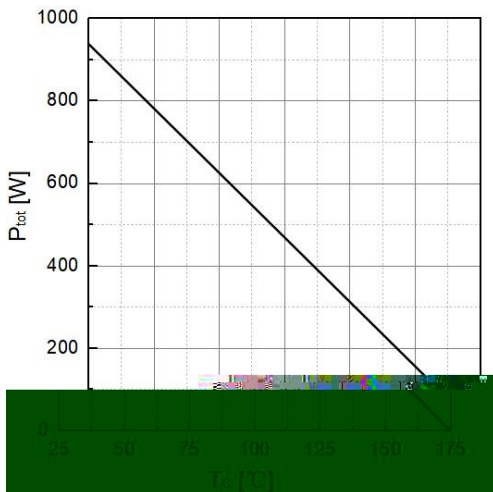
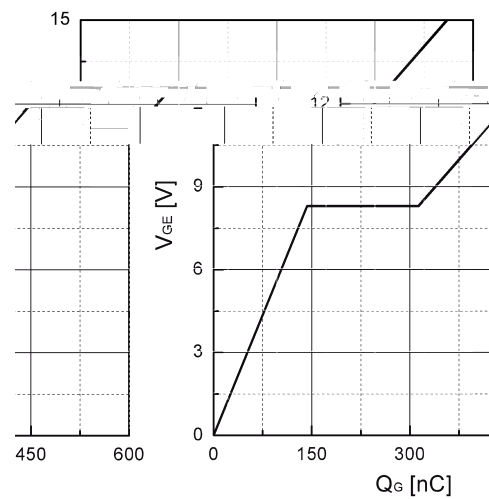
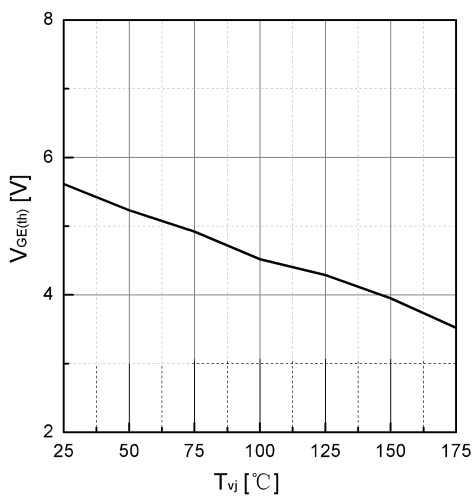
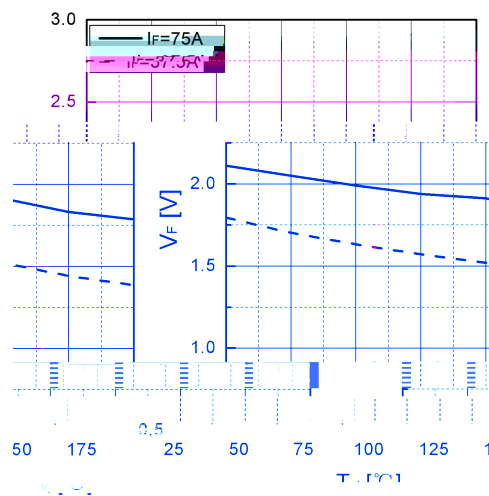

Fig 1. Typical output characteristic ( $T_{vj}=25$  °C)

Fig 2. Typical output characteristic ( $T_{vj}=175$  °C)

Fig 3. Power dissipation as a function of  $T_c$ 


Fig 4. Typical Gate charge


Fig 5. Typical  $V_{GE(th)}$  as a function of  $T_{vj}$   
( $I_C=1mA$ )

Fig 6. Typical  $V_F$  as a function of  $T_{vj}$

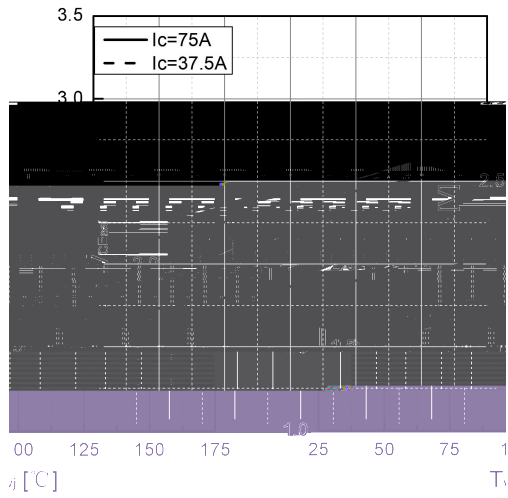


Fig 7. Typical  $V_{CE(sat)}$  as a function of  $T_{vj}$

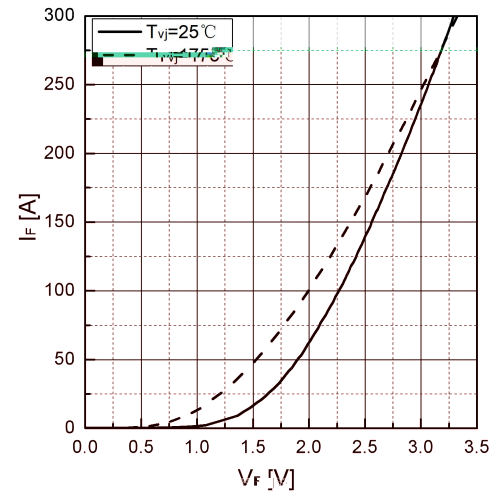


Fig 8. Typical  $I_F$  as a function of  $V_F$

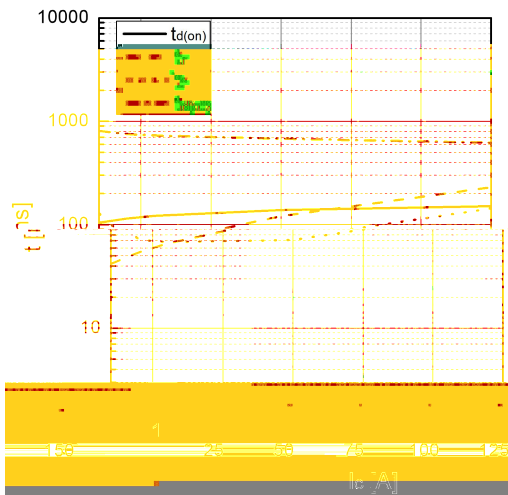


Fig 9. Typical switching time as a function of  $I_c$

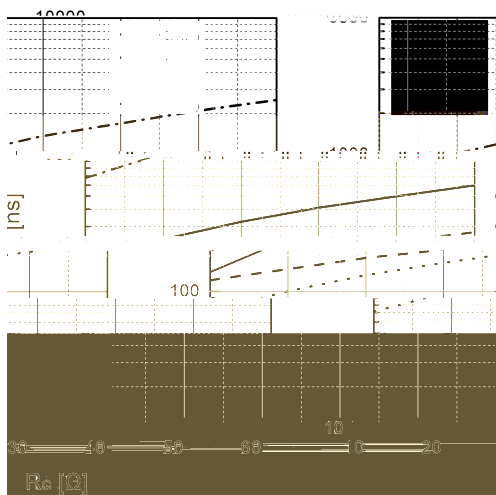


Fig 10. Typical switching times as a function of  $R_G$

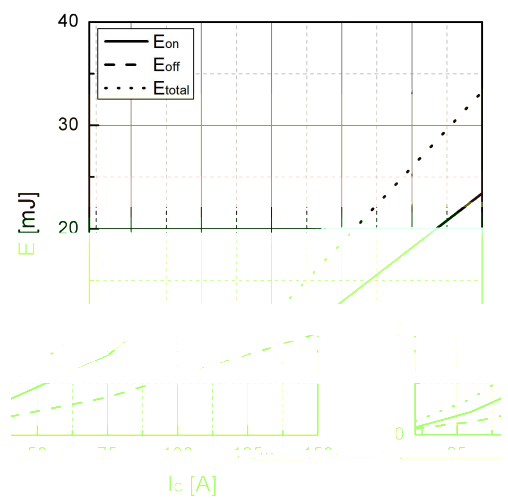


Fig 11. Typical switching energy losses as a function of  $I_c$

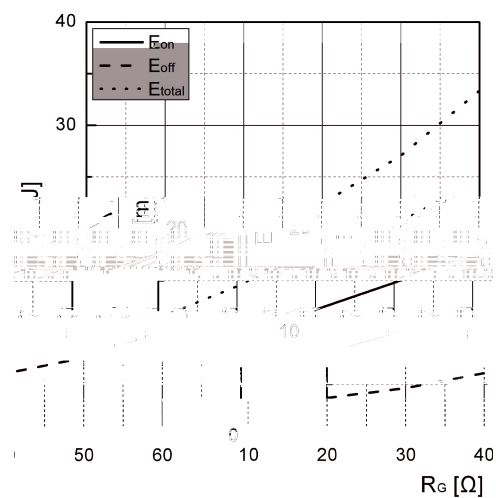


Fig 12. Typical switching energy losses as a function of  $R_G$

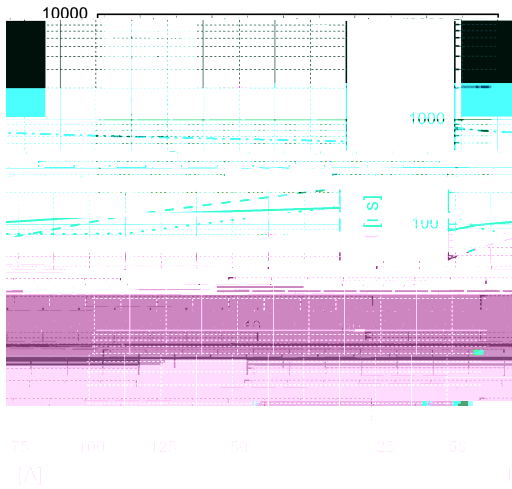


Fig 13. Typical switching time as a function of  $I_C$   
( $T_{vj}=175^\circ\text{C}$ )

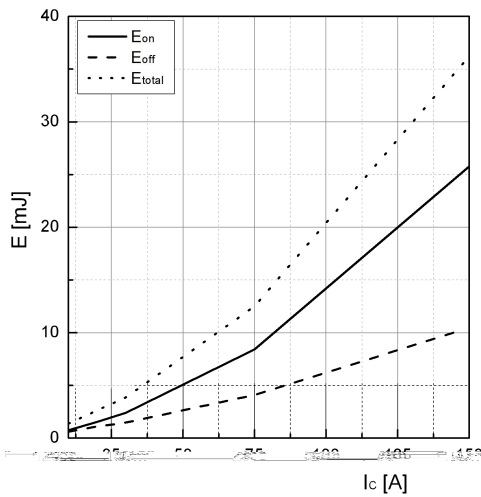


Fig 15. Typical switching energy losses as a function of  $I_C$  ( $T_{vj}=175^\circ\text{C}$ )

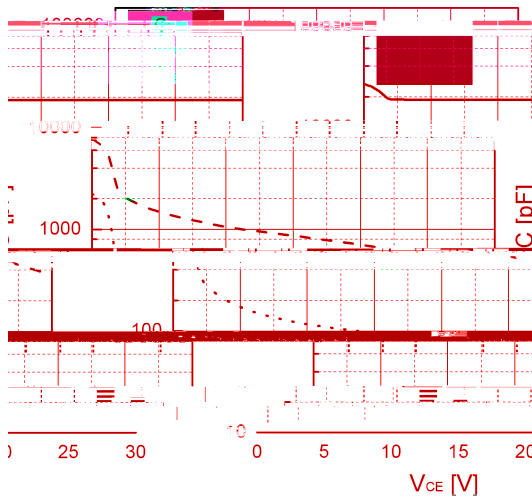


Fig 17. Typical capacitance as a function of  $V_{CE}$   
( $f=1\text{MHz}$ ,  $V_{GE}=5\text{V}$ )

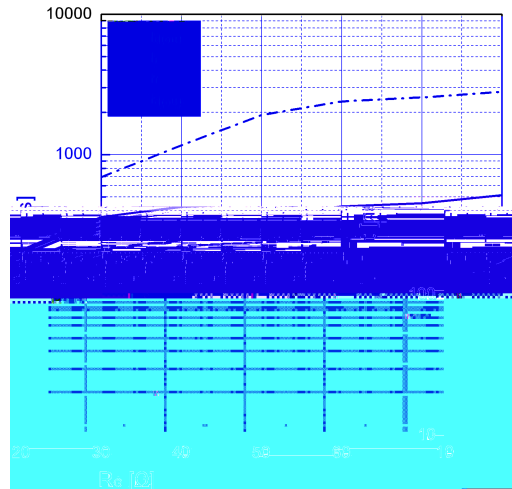


Fig 14. Typical switching times as a function of  $R_G$   
( $T_{vj}=175^\circ\text{C}$ )

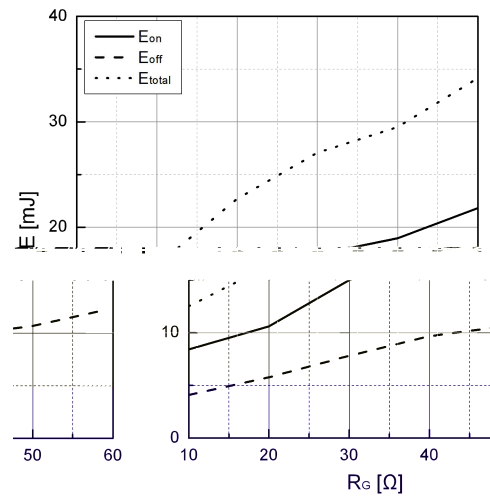
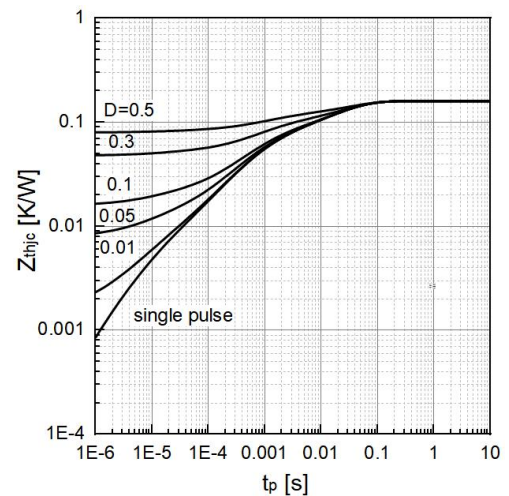
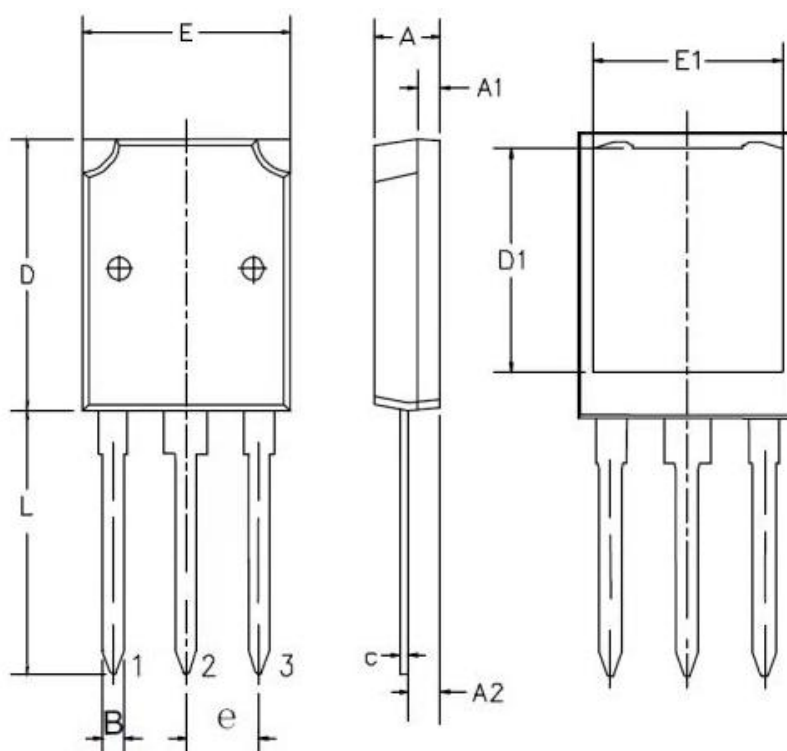


Fig 16. Typical switching energy losses as a function of  $R_G$  ( $T_{vj}=175^\circ\text{C}$ )



## TO-247PLUS



| Ref. | Min.(mm) | Typ.(mm) | Max.(mm) |
|------|----------|----------|----------|
| A    | 4.92     | 5.00     | 5.08     |
| A2   | 2.27     | 2.35     | 2.43     |
| A1   | 1.92     | 2.00     | 2.08     |
| B    | 1.16     | 1.20     | 1.24     |
| C    | 0.56     | 0.60     | 0.64     |
| D    | 20.70    | 20.90    | 21.1     |
| E    | 15.80    | 15.90    | 16.00    |
| E1   | 13.92    | 14.02    | 14.12    |
| e    | 5.34     | 5.44     | 5.54     |
| L    | 19.80    | 20.00    | 20.20    |



| Date       | Revision | Changes                 |
|------------|----------|-------------------------|
| 2025-01-26 | Rev. 1.2 | Add SOA and Rth graph   |
| 2025-02-17 | Rev. 1.3 | Modify the package size |
| 2025-03-03 | Rev. 2.0 | Replace sketch          |
| 2026-06-26 | Rev. 2.1 | Update thermal          |

PLEASE NOTE - Jiangsu JieJie Microelectronics Co., Ltd ("JJM") reserves the right to amend, correct, modify