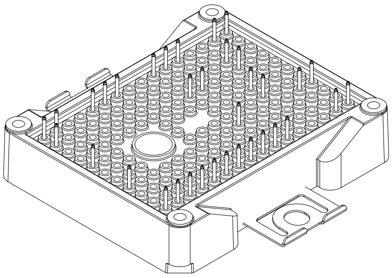
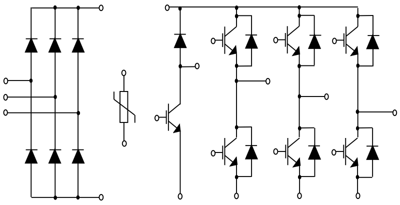
# A2C35S12M3

Datasheet

## ACEPACK 2 converter inverter brake, 1200 V, 35 A, trench gate field-stop M series IGBT with soft diode and NTC



**ACEPACK 2**



| Product status |
|---|
| A2C35S12M3 |

| Product summary | |
|---|---|
| **Order code** | A2C35S12M3 |
| **Marking** | A2C35S12M3 |
| **Package** | ACEPACK 2 |
| **Leads type** | Solder contact pins |

## Features

- ACEPACK 2 power module
    - DBC Cu $Al_2O_3$ Cu
- Converter inverter brake topology
    - 1600 V, very low drop rectifiers for converter
    - 1200 V, 35 A IGBTs and diodes
    - Soft and fast recovery diode
- Integrated NTC
- UL recognition: UL 1557, file E81734
- Isolation rating of 2500 $V_{rms}$/min
- RoHS compliant

## Applications

- Inverters
- Motor drives

## Description

This power module is a converter-inverter brake (CIB) topology in an ACEPACK 2 package with NTC, integrating the advanced trench gate field-stop technology from STMicroelectronics. This new IGBT technology represents the best compromise between conduction and switching loss, to maximize the efficiency of any converter system up to 20 kHz.

# 1 Electrical ratings

## 1.1 Inverter stage

Limiting values at $T_J$ = 25 °C, unless otherwise specified.

### 1.1.1 IGBTs

**Table 1. Absolute maximum ratings of the IGBTs, inverter stage**

| Symbol | Description | Value | Unit |
|---|---|---|---|
| $V_{CES}$ | Collector-emitter voltage ($V_{GE}$ = 0) | 1200 | V |
| $I_C$ | Continuous collector current ($T_C$ = 100 °C) | 35 | A |
| $I_{CP}$(1) | Pulsed collector current ($t_p$ = 1 ms) | 70 | A |
| $V_{GE}$ | Gate-emitter voltage | ± 20 | V |
| $P_{TOT}$ | Total power dissipation of each IGBT ($T_C$ = 25 °C, $T_J$ = 175 °C) | 250 | W |
| $T_{JMAX}$ | Maximum junction temperature | 175 | °C |
| $T_{Jop}$ | Operating junction temperature range under switching conditions | -40 to 150 | °C |

1. *Pulse width limited by maximum junction temperature.*

**Table 2. Electrical characteristics of the IGBTs, inverter stage**

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_{(BR)CES}$ | Collector-emitter breakdown voltage | $I_C$ = 1 mA, $V_{GE}$ = 0 V | 1200 | | | V |
| $V_{CE(sat)}$ (terminal) | Collector-emitter saturation voltage | $V_{GE}$ = 15 V, $I_C$= 35 A | | 1.95 | 2.45 | V |
| | | $V_{GE}$ = 15 V, $I_C$ = 35 A, $T_J$ = 150 °C | | 2.3 | | V |
| $V_{GE(th)}$ | Gate threshold voltage | $V_{CE}$ = $V_{GE}$, $I_C$ = 1 mA | 5 | 6 | 7 | V |
| $I_{CES}$ | Collector cut-off current | $V_{GE}$ = 0 V, $V_{CE}$ = 1200 V | | | 100 | µA |
| $I_{GES}$ | Gate-emitter leakage current | $V_{CE}$ = 0 V, $V_{GE}$ = ±20 V | | | ±500 | nA |
| $C_{ies}$ | Input capacitance | $V_{CE}$ = 25 V, f = 1 MHz, $V_{GE}$ = 0 V | | 2154 | | pF |
| $C_{oes}$ | Output capacitance | | | 164 | | pF |
| $C_{res}$ | Reverse transfer capacitance | | | 86 | | pF |
| $Q_g$ | Total gate charge | $V_{CC}$ = 960 V, $I_C$ = 35 A,<br>$V_{GE}$ = ±15 V | | 163 | | nC |
| $t_{d(on)}$ | Turn-on delay time | $V_{CC}$ = 600 V, $I_C$ = 35 A,<br>$R_G$ = 10 Ω, $V_{GE}$ = ±15 V,<br>di/dt = 1460 A/µs | | 127 | | ns |
| $t_r$ | Current rise time | | | 18.5 | | ns |
| $E_{on}$ (1) | Turn-on switching energy | | | 1.065 | | mJ |

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $t_{d(off)}$ | Turn-off delay time | $V_{CC}$ = 600 V, $I_C$ = 35 A,<br>$R_G$ = 10 Ω, $V_{GE}$ = ±15 V,<br>dv/dt = 9000 V/μs |  | 135 |  | ns |
| $t_f$ | Current fall time |  |  | 133 |  | ns |
| $E_{off}$ (2) | Turn-off switching energy |  |  | 1.83 |  | mJ |
| $t_{d(on)}$ | Turn-on delay time | $V_{CC}$ = 600 V, $I_C$ = 35 A,<br>$R_G$ = 10 Ω, $V_{GE}$ = ±15 V,<br>di/dt = 1424 A/μs, $T_J$ = 150 °C |  | 125 |  | ns |
| $t_r$ | Current rise time |  |  | 20 |  | ns |
| $E_{on}$ (1) | Turn-on switching energy |  |  | 1.79 |  | mJ |
| $t_{d(off)}$ | Turn-off delay time | $V_{CC}$ = 600 V, $I_C$ = 35 A,<br>$R_G$ = 10 Ω, $V_{GE}$ = ±15 V,<br>dv/dt = 7500 V/μs, $T_J$ = 150 °C |  | 140 |  | ns |
| $t_f$ | Current fall time |  |  | 224 |  | ns |
| $E_{off}$ (2) | Turn-off switching energy |  |  | 2.85 |  | mJ |
| $t_{SC}$ | Short-circuit withstand time | $V_{CC} \leq$ 600 V, $V_{GE} \leq$ 15 V,<br>$T_{Jstart} \leq$ 150 °C | 10 |  |  | μs |
| $R_{THj-c}$ | Thermal resistance junction-to-case | Each IGBT |  | 0.55 | 0.60 | °C/W |
| $R_{THc-h}$ | Thermal resistance case-to-heatsink | Each IGBT,$\lambda_{grease}$ = 1 W/(m·°C) |  | 0.70 |  | °C/W |

1. *Including the reverse recovery of the diode.*
2. *Including the tail of the collector current.*

### 1.1.2 Diode

Limiting values at $T_J$ = 25 °C, unless otherwise specified.

**Table 3. Absolute maximum ratings of the diode, inverter stage**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{RRM}$ | Repetitive peak reverse voltage | 1200 | V |
| $I_F$ | Continuous forward current ($T_C$ = 100 °C) | 35 | A |
| $I_{FP}$(1) | Pulsed forward current ($t_p$ = 1 ms) | 70 | A |
| $T_{JMAX}$ | Maximum junction temperature | 175 | °C |
| $T_{Jop}$ | Operating junction temperature range under switching conditions | -40 to 150 | °C |

1. *Pulse width limited by maximum junction temperature*

**Table 4. Electrical characteristics of the diode, inverter stage**

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_F$ (terminal) | Forward voltage | $I_F$ = 35 A | - | 2.95 | 4.1 | V |
|  |  | $I_F$ = 35 A, $T_J$ = 150 ˚C | - | 2.3 |  |  |
| $t_{rr}$ | Reverse recovery time | $I_F$ = 35 A, $V_R$ = 600 V,<br>$V_{GE}$ = ±15 V, $di_F/dt$ = 1460 A/μs | - | 200 |  | ns |
| $Q_{rr}$ | Reverse recovery charge |  | - | 2.7 |  | μC |
| $I_{rrm}$ | Reverse recovery current |  | - | 43 |  | A |
| $E_{rec}$ | Reverse recovery energy |  | - | 1.1 |  | mJ |

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $t_{rr}$ | Reverse recovery time | $I_F$ = 35 A, $V_R$ = 600 V,<br>$V_{GE}$ = ±15 V, $di_F/dt$ = 1424 A/µs,<br>$T_J$ = 150 °C | - | 380 | | ns |
| $Q_{rr}$ | Reverse recovery charge | | - | 6.8 | | µC |
| $I_{rrm}$ | Reverse recovery current | | - | 60 | | A |
| $E_{rec}$ | Reverse recovery energy | | - | 3.2 | | mJ |
| $R_{THj\text{-}c}$ | Thermal resistance junction-to-case | Each diode | - | 0.80 | 0.90 | °C/W |
| $R_{THc\text{-}h}$ | Thermal resistance case-to-heatsink | Each diode, $\lambda_{grease}$ = 1 W/(m·°C) | - | 0.75 | | °C/W |

## 1.2 Brake stage

Limiting values at $T_J$ = 25 °C, unless otherwise specified.

### 1.2.1 IGBT

Table 5. **Absolute maximum ratings of the IGBT, brake stage**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CES}$ | Collector-emitter voltage ($V_{GE}$ = 0) | 1200 | V |
| $I_C$ | Continuous collector current ($T_C$ = 100 °C) | 35 | A |
| $I_{CP}$ (1) | Pulsed collector current ($t_p$ = 1 ms) | 70 | A |
| $V_{GE}$ | Gate-emitter voltage | ±20 | V |
| $P_{TOT}$ | Total power dissipation of each IGBT<br>($T_C$ = 25 °C, $T_J$ = 175 °C) | 250 | W |
| $T_{JMAX}$ | Maximum junction temperature | 175 | °C |
| $T_{Jop}$ | Operating junction temperature range under switching conditions | -40 to 150 | °C |

1. *Pulse width limited by maximum junction temperature.*

Table 6. **Electrical characteristics of the IGBT, brake stage**

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_{(BR)CES}$ | Collector-emitter breakdown voltage | $I_C$ = 1 mA, $V_{GE}$ = 0 V | 1200 | | | V |
| $V_{CE(sat)}$ (terminal) | Collector-emitter saturation voltage | $V_{GE}$ = 15 V, $I_C$ = 35 A | | 1.95 | | V |
| | | $V_{GE}$ = 15 V, $I_C$ = 35 A,<br>$T_J$ = 150 °C | | 2.3 | | |
| $V_{GE(th)}$ | Gate threshold voltage | $V_{CE}$ = $V_{GE}$, $I_C$ = 1mA | 5 | 6 | 7 | V |
| $I_{CES}$ | Collector cut-off current | $V_{GE}$ = 0 V, $V_{CE}$ = 1200 V | | | 100 | µA |
| $I_{GES}$ | Gate-emitter leakage current | $V_{CE}$ = 0 V, $V_{GE}$ = ±20 V | | | ± 500 | nA |
| $C_{ies}$ | Input capacitance | $V_{CE}$ = 25 V, f = 1 MHz, $V_{GE}$ = 0 V | | 2154 | | pF |
| $C_{oes}$ | Output capacitance | | | 164 | | pF |
| $C_{res}$ | Reverse transfer capacitance | | | 86 | | pF |

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $Q_g$ | Total gate charge | $V_{CC}$ = 960 V, $I_C$ = 35 A,<br>$V_{GE}$ = ±15 V | | 163 | | nC |
| $t_{d(on)}$ | Turn-on delay time | $V_{CC}$ = 600 V, $I_C$ = 35 A,<br>$R_G$ = 10 Ω, $V_{GE}$ = ±15 V,<br>di/dt = 1460 A/μs | | 127 | | ns |
| $t_r$ | Current rise time | | | 18.5 | | ns |
| $E_{on}$ (1) | Turn-on switching energy | | | 1.065 | | mJ |
| $t_{d(off)}$ | Turn-off delay time | $V_{CC}$ = 600 V, $I_C$ = 35 A,<br>$R_G$ = 10 Ω, $V_{GE}$ = ±15 V,<br>dv/dt = 9000 V/μs | | 135 | | ns |
| $t_f$ | Current fall time | | | 133 | | ns |
| $E_{off}$ (2) | Turn-off switching energy | | | 1.83 | | mJ |
| $t_{d(on)}$ | Turn-on delay time | $V_{CC}$ = 600 V, $I_C$ = 35 A,<br>$R_G$ = 10 Ω, $V_{GE}$ = ±15 V,<br>di/dt = 1424 A/μs,$T_J$ = 150 °C | | 125 | | ns |
| $t_r$ | Current rise time | | | 20 | | ns |
| $E_{on}$ (1) | Turn-on switching energy | | | 1.79 | | mJ |
| $t_{d(off)}$ | Turn-off delay time | $V_{CC}$ = 600 V, $I_C$ = 35 A,<br>$R_G$ = 10 Ω, $V_{GE}$ = ±15 V,<br>dv/dt = 7500 V/μs,$T_J$ = 150 °C | | 140 | | ns |
| $t_f$ | Current fall time | | | 224 | | ns |
| $E_{off}$ (2) | Turn-off switching energy | | | 2.85 | | mJ |
| $t_{SC}$ | Short-circuit withstand time | $V_{CC}$ ≤ 600 V, $V_{GE}$≤ 15 V,<br>$T_{Jstart}$ ≤ 150 °C | 10 | | | μs |
| $R_{THj\text{-}c}$ | Thermal resistance junction-to-case | Each IGBT | | 0.55 | 0.60 | °C/W |
| $R_{THc\text{-}h}$ | Thermal resistance case-to-heatsink | Each IGBT, $\lambda_{grease}$ = 1 W/(m·°C) | | 0.70 | | °C/W |

1. *Including the reverse recovery of the diode.*
2. *Including the tail of the collector current.*

### 1.2.2 Diode

Table 7. **Absolute maximum ratings of the diode, brake stage**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{RRM}$ | Repetitive peak reverse voltage | 1200 | Vrms |
| $I_F$ | Continuous forward current ($T_C$ = 100 °C) | 35 | A |
| $I_{FP}$[1] | Pulsed forward current ($t_p$ = 1 ms) | 70 | A |
| $T_{JMAX}$ | Maximum junction temperature | 175 | °C |
| $T_{Jop}$ | Operating junction temperature range under switching conditions | -40 to 150 | °C |

1. *Pulse width limited by maximum junction temperature*

Table 8. **Electrical characteristics of the diode, brake stage**

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_F$ (terminal) | Forward voltage | $I_F$ = 35 A | - | 2.95 | | V |
| | | $I_F$ = 35 A, $T_J$ = 150 ˚C | - | 2.3 | | |
| $t_{rr}$ | Reverse recovery time | $I_F$ = 35 A, $V_R$ = 600 V, $V_{GE}$ = ±15 V, di/dt = 1460 A/µs | - | 200 | | ns |
| $Q_{rr}$ | Reverse recovery charge | | - | 2.7 | | µC |
| $I_{rrm}$ | Reverse recovery current | | - | 43 | | A |
| $E_{rec}$ | Reverse recovery energy | | - | 1.1 | | mJ |
| $t_{rr}$ | Reverse recovery time | $I_F$ = 35 A, $V_R$ = 600 V, $V_{GE}$ = ±15 V, di/dt = 1424 A/µs, $T_J$ = 150 °C | - | 380 | | ns |
| $Q_{rr}$ | Reverse recovery charge | | - | 6.8 | | µC |
| $I_{rrm}$ | Reverse recovery current | | - | 60 | | A |
| $E_{rec}$ | Reverse recovery energy | | - | 3.2 | | mJ |
| $R_{THj-c}$ | Thermal resistance junction-to-case | Each diode | - | 0.80 | 0.90 | °C/W |
| $R_{THc-h}$ | Thermal resistance case-to-heatsink | Each diode, $\lambda_{grease}$ = 1 W/(m·°C) | - | 0.75 | | °C/W |

## 1.3 Converter stage

Limiting values at $T_J$ = 25 °C, unless otherwise specified.

**Table 9. Absolute maximum ratings of the bridge rectifiers**

| Symbol | Description | Value | Unit |
|---|---|---|---|
| $V_{RRM}$ | Repetitive peak reverse voltage | 1600 | V |
| $I_F$ | RMS forward current | 70 | A |
| $I_{FSM}$ | Forward surge current, $t_p$ = 10 ms, $T_C$ = 25 °C | 450 | A |
| | Forward surge current, $t_p$ = 10 ms, $T_C$ = 150 °C | 365 | |
| $I^2t$ | $t_p$ = 10 ms, $T_C$ = 25 °C | 1012 | $A^2s$ |
| | $t_p$ = 10 ms, $T_C$ = 150 °C | 666 | |
| $T_{JMAX}$ | Maximum junction temperature | 175 | °C |
| $T_{Jop}$ | Operating junction temperature range under switching conditions | -40 to 150 | °C |

**Table 10. Electrical characteristics of the bridge rectifiers**

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_F$ (terminal) | Forward voltage | $I_F$ = 35 A | - | 1.12 | 1.5 | V |
| | | $I_F$ = 35 A, $T_J$ = 150 °C | - | 1.02 | | |
| $I_R$ | Reverse current | $T_J$ = 150 °C, $V_R$ = 1600 V | - | 1 | | mA |
| $R_{THj-c}$ | Thermal resistance junction-to-case | Each diode | - | 1.00 | 1.10 | °C/W |
| $R_{THc-h}$ | Thermal resistance case-to-heatsink | Each diode, $\lambda_{grease}$ = 1 W/(m·°C) | - | 0.95 | | °C/W |

## 1.4 NTC

**Table 11. NTC temperature sensor, considered as stand-alone**

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $R_{25}$ | Resistance | T = 25 °C | | 5 | | kΩ |
| $R_{100}$ | Resistance | T = 100 °C | | 493 | | Ω |
| $\Delta R/R$ | Deviation of $R_{100}$ | | -5 | | +5 | % |
| $B_{25/50}$ | B-constant | | | 3375 | | K |
| $B_{25/80}$ | B-constant | | | 3411 | | K |
| T | Operating temperature range | | -40 | | 150 | °C |

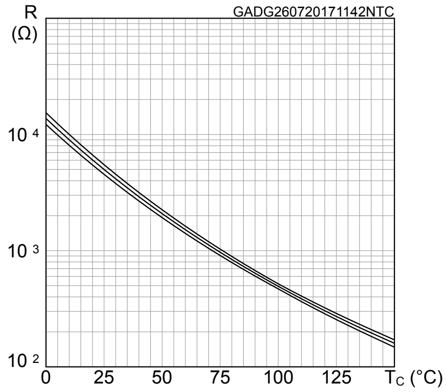


**Figure 1.** NTC resistance vs temperature

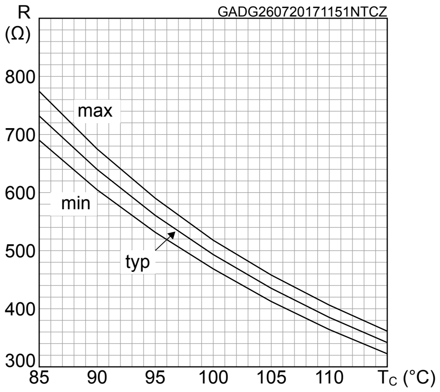


**Figure 2.** NTC resistance vs temperature, zoom

## 1.5 Package

**Table 12.** ACEPACK™ 2 package

| Symbol | Parameter | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| $V_{isol}$ | Isolation voltage (AC voltage, t = 60 s) | | | 2500 | $V_{rms}$ |
| $T_{stg}$ | Storage temperature | -40 | | 125 | °C |
| CTI | Comparative tracking index | 200 | | | |
| $L_s$ | Stray inductance module P1 - EW loop | | 33.5 | | nH |
| $R_s$ | Module single lead resistance, terminal-to-chip | | 3.6 | | mΩ |

# 2 Electrical characteristics (curves)

**Figure 3. IGBT output characteristics ($V_{GE}$ = 15 V, terminal)**

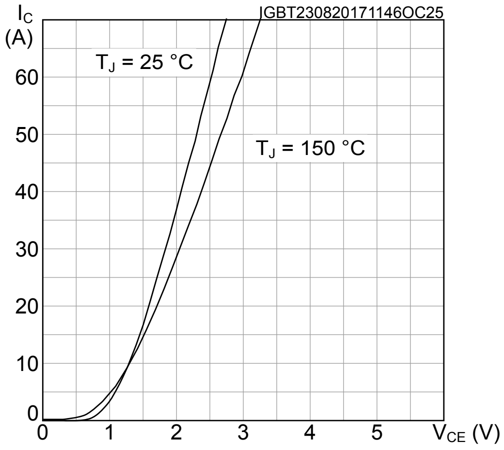


**Figure 4. IGBT output characteristics ($T_J$ = 150 °C, terminal)**

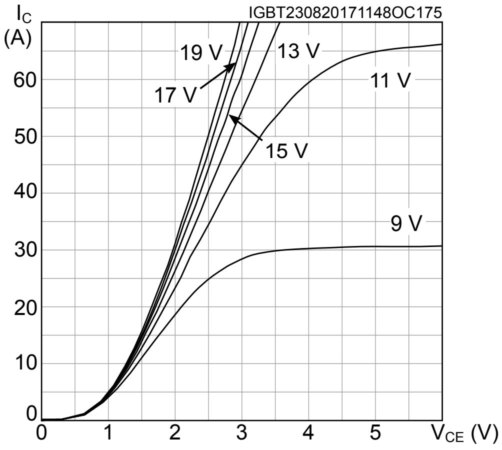


**Figure 5. IGBT transfer characteristics ($V_{CE}$ = 15 V, terminal)**

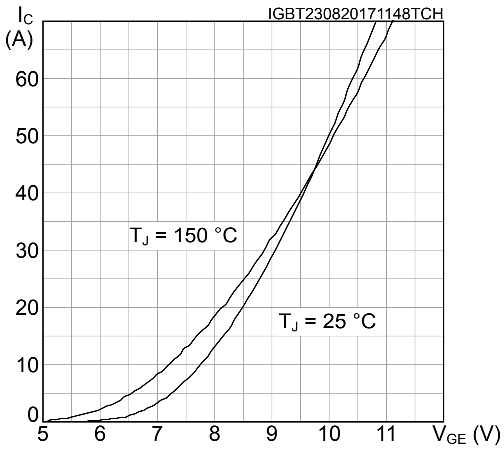


**Figure 6. IGBT collector current vs case temperature**

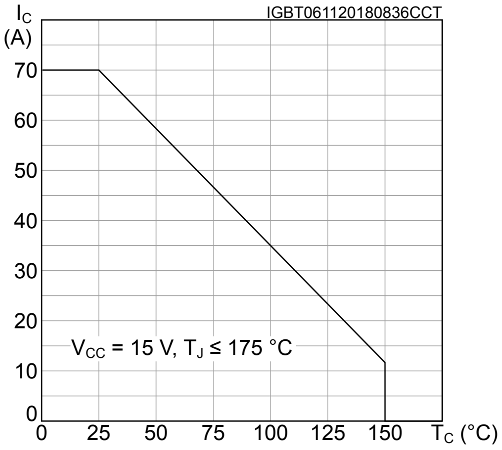


Figure 7. Switching energy vs gate resistance

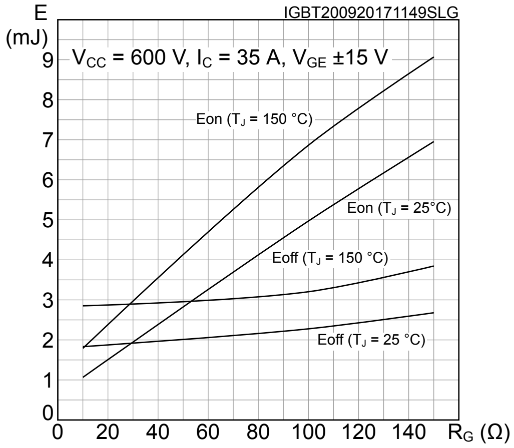


Figure 8. Switching energy vs collector current

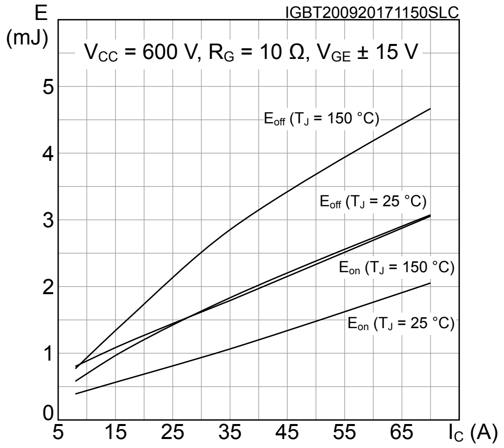


Figure 9. IGBT reverse biased safe operating area (RBSOA)

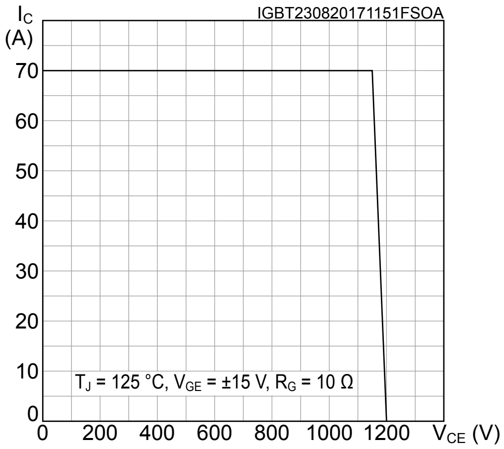


Figure 10. Diode forward characteristics (terminal)

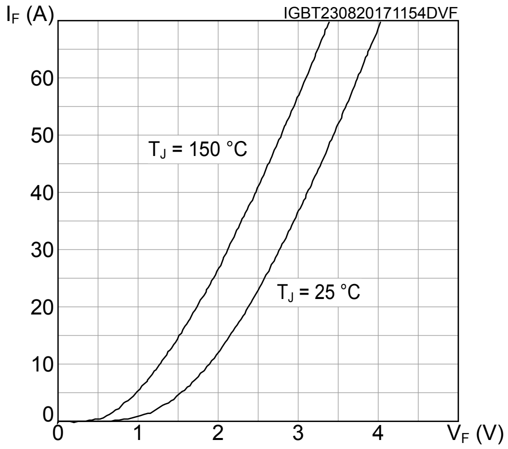


Figure 11. Diode reverse recovery energy vs diode current slope

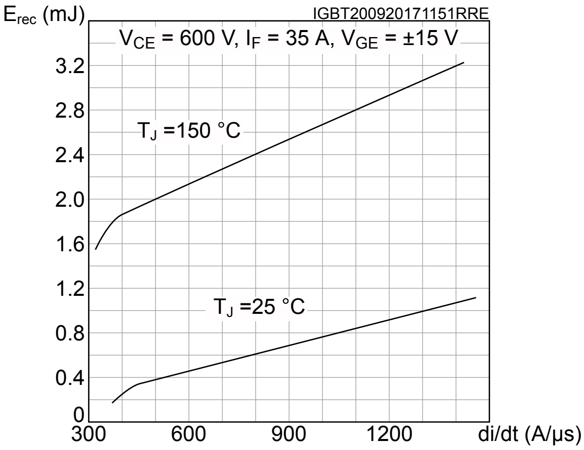


Figure 12. Diode reverse recovery energy vs forward current

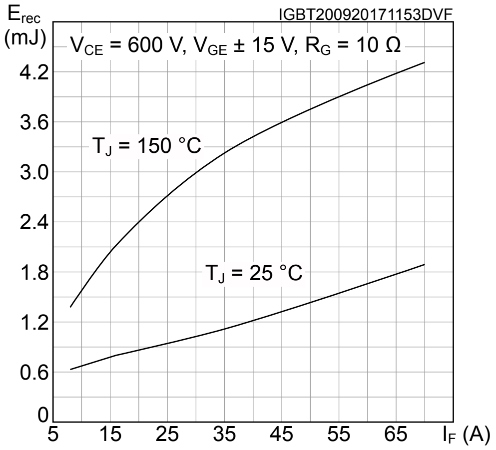


**Figure 13.** Diode reverse recovery energy vs gate resistance

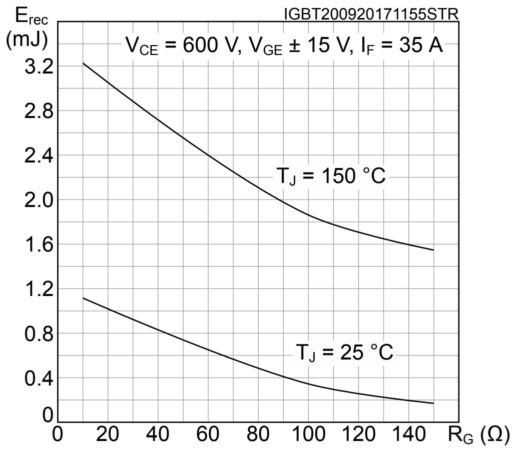


**Figure 14.** Converter diode forward characteristics (terminal)

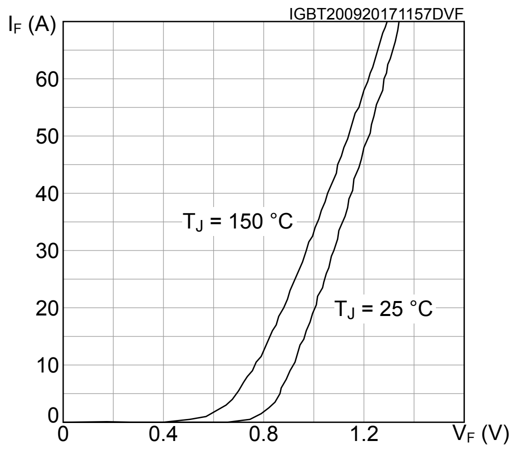
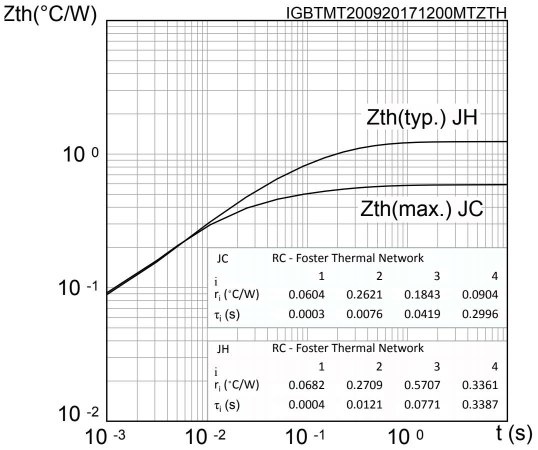


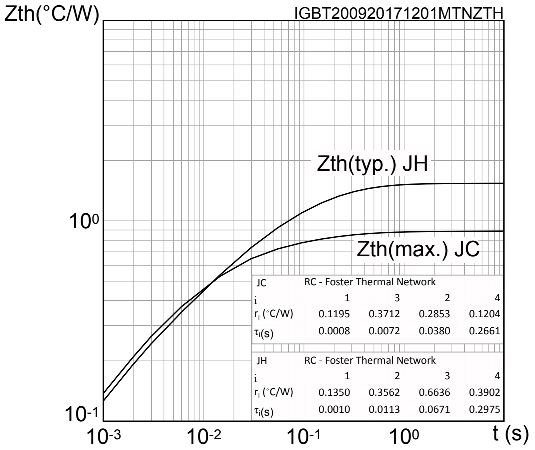
**Figure 15.** IGBT thermal impedance



| JC | RC - Foster Thermal Network | | | |
|---|---|---|---|---|
| i | 1 | 2 | 3 | 4 |
| $r_i$ (°C/W) | 0.0604 | 0.2621 | 0.1843 | 0.0904 |
| $\tau_i$ (s) | 0.0003 | 0.0076 | 0.0419 | 0.2996 |

| JH | RC - Foster Thermal Network | | | |
|---|---|---|---|---|
| i | 1 | 2 | 3 | 4 |
| $r_i$ (°C/W) | 0.0682 | 0.2709 | 0.5707 | 0.3361 |
| $\tau_i$ (s) | 0.0004 | 0.0121 | 0.0771 | 0.3387 |

**Figure 16.** Inverter diode thermal impedance



| JC | RC - Foster Thermal Network | | | |
|---|---|---|---|---|
| i | 1 | 3 | 2 | 4 |
| $r_i$ (°C/W) | 0.1195 | 0.3712 | 0.2853 | 0.1204 |
| $\tau_i$(s) | 0.0008 | 0.0072 | 0.0380 | 0.2661 |

| JH | RC - Foster Thermal Network | | | |
|---|---|---|---|---|
| i | 1 | 2 | 3 | 4 |
| $r_i$ (°C/W) | 0.1350 | 0.3562 | 0.6636 | 0.3902 |
| $\tau_i$(s) | 0.0010 | 0.0113 | 0.0671 | 0.2975 |

# 3 Test circuits

**Figure 17.** Test circuit for inductive load switching

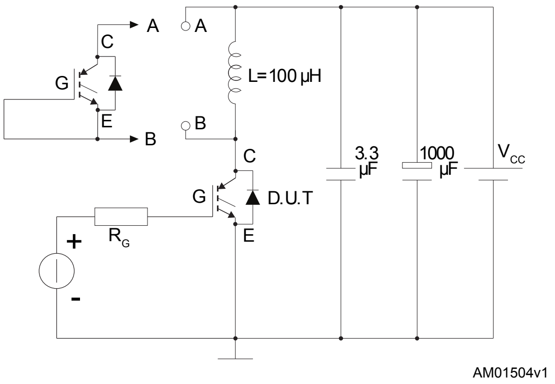


**Figure 18.** Gate charge test circuit

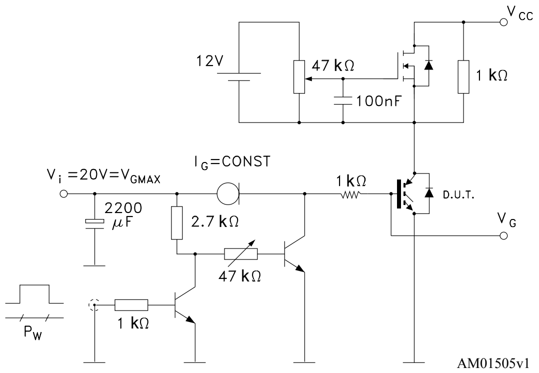


**Figure 19.** Switching waveform

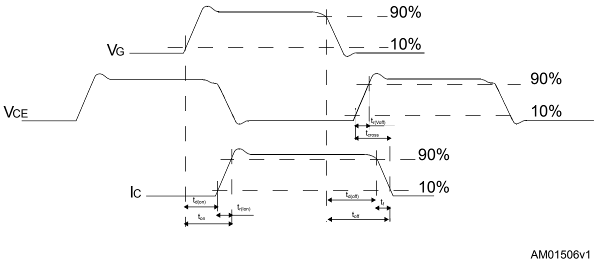
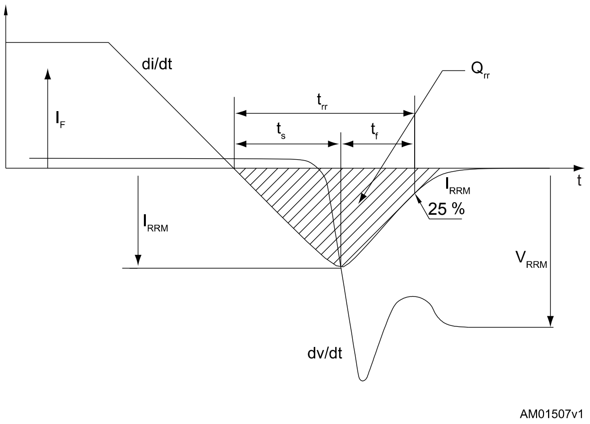


**Figure 20.** Diode reverse recovery waveform



# 4 Topology and pin description

Figure 21. Electrical topology and pin description

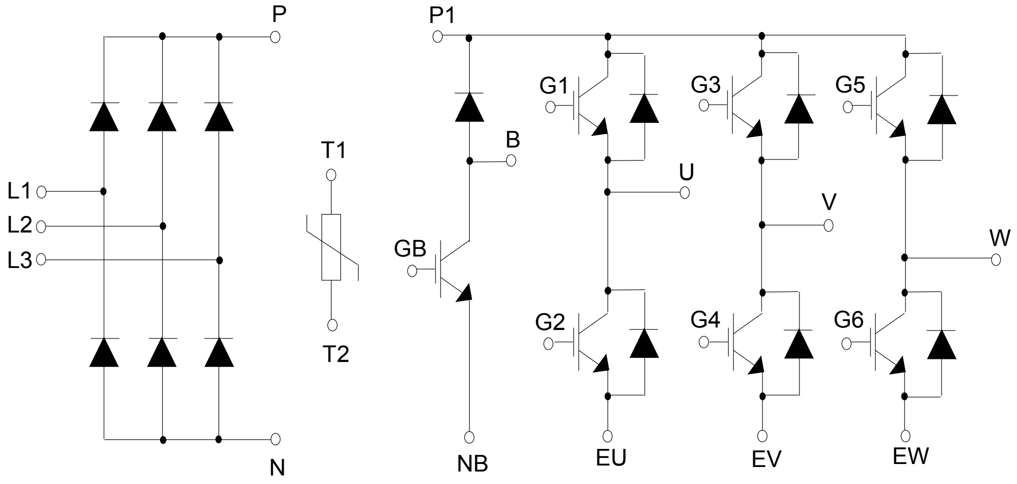
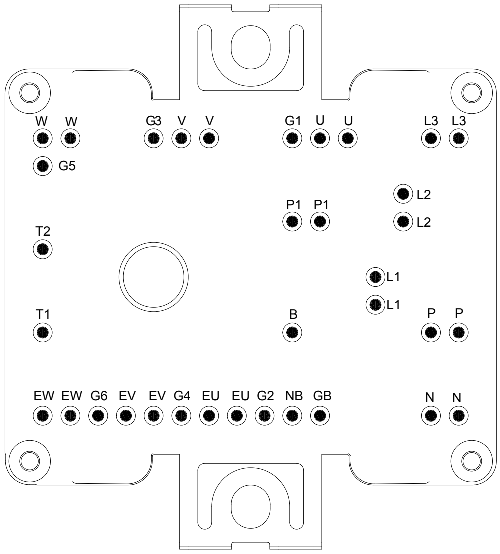


Figure 22. Package top view with CIB pinout

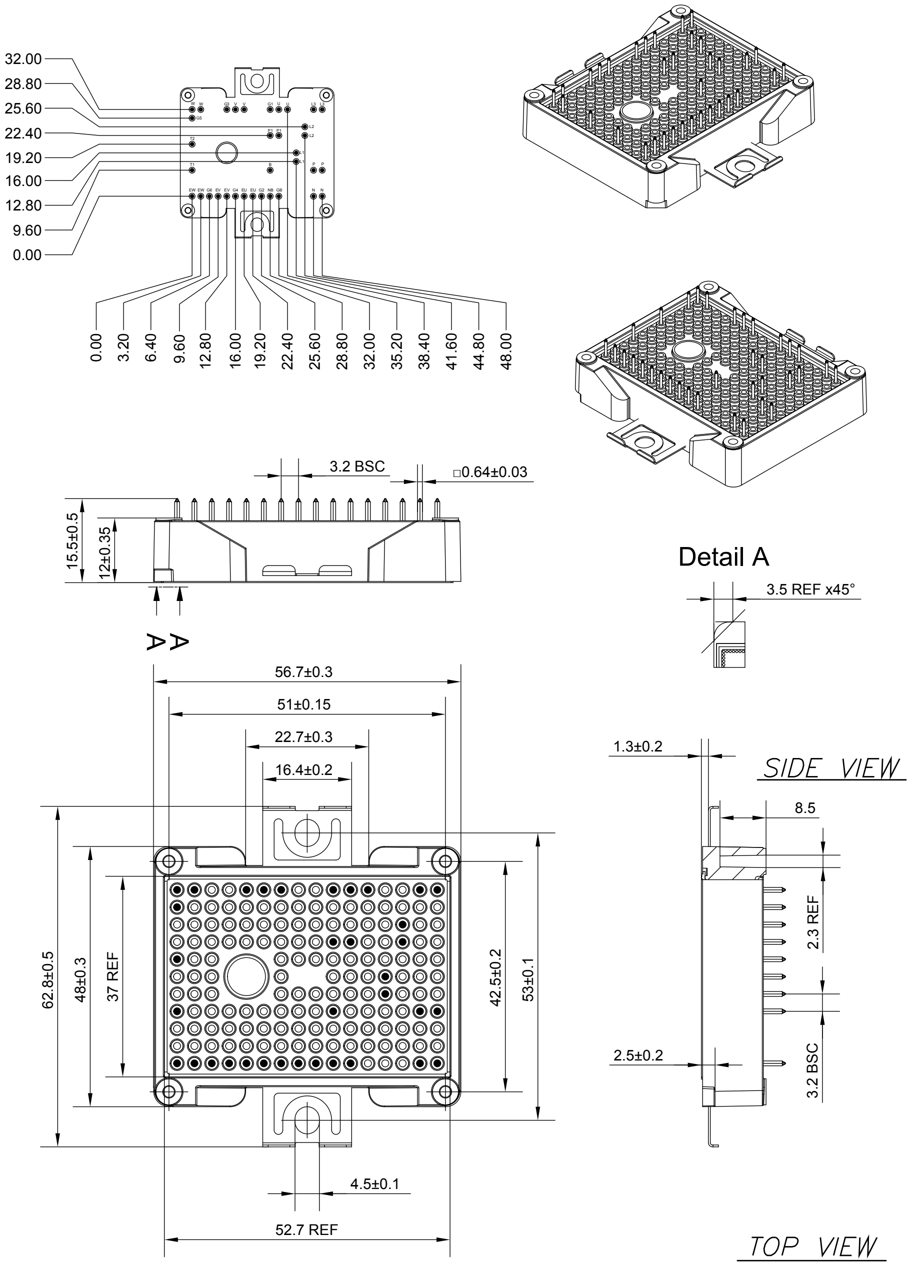


# 5 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions and product status are available at: www.st.com. ECOPACK is an ST trademark.

## 5.1 ACEPACK 2 CIB solder pins package information

Figure 23. **ACEPACK 2 CIB solder pins package outline (dimensions are in mm)**



8569722_ACEPACK2_CIB_solderable_pins

- The lead size includes the thickness of the lead plating material.
- Dimensions do not include mold protrusion.
- Package dimensions do not include any eventual metal burrs.

## Revision history

Table 13. **Document revision history**

| Date | Revision | Changes |
|---|---|---|
| 01-Feb-2016 | 1 | Initial release. |
| 12-Jan-2017 | 2 | Document status promoted from preliminary to production data.<br>Added Section 2: "Electrical characteristics (curves)" and Section 3: "Test circuits".<br>Updated Section 5.1: "ACEPACK™ 2 CIB solderable pins package information".<br>Minor text changes. |
| 20-Sep-2017 | 3 | Updated title, features and description in cover page.<br>Updated Table 1: "Device summary", Section 1: "Electrical ratings",<br>Section 2: "Electrical characteristics curves", Section 4: "Topology and pin description" and Section 5: "Package information".<br>Minor text changes. |
| 14-Mar-2018 | 4 | Removed maturity status indication from cover page.<br>Updated features in cover page, *Section 1.1.1 IGBTs, Section 1.1.2 Diode*, *Section 1.2.1 IGBT*, *Section 1.2.2 Diode*, *Section 1.3 Converter stage*, *Section 1.5 Package*, *Section 2 A2C35S12M3 electrical characteristics curves* and *Figure 22. ACEPACK™ 2 CIB solder pins package outline (dimensions are in mm)*.<br>Minor text changes. |
| 06-Nov-2018 | 5 | Updated title in cover page.<br>Added *Figure 6. IGBT collector current vs case temperature*.<br>Minor text changes. |
| 12-Apr-2019 | 6 | Updated features in cover page. |

# Contents

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