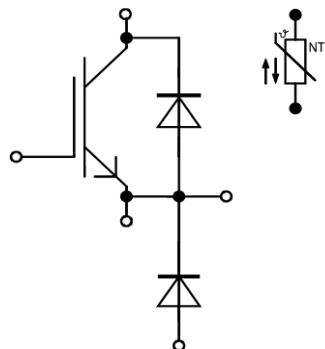
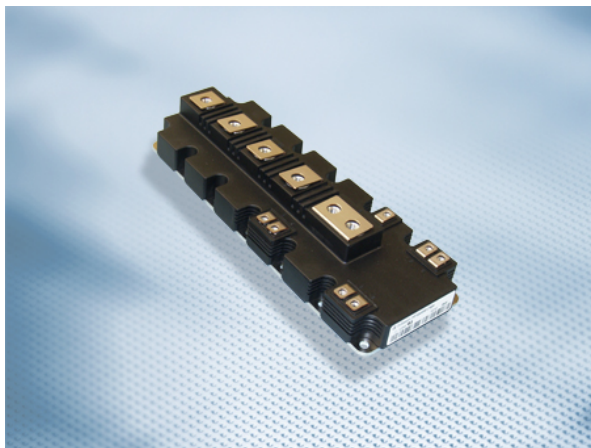


PrimePACK™3 モジュール トレンチ/フィールドストップ IGBT4 and エミッターコントロール4 diode内蔵  
PrimePACK™3 module with Trench/Fieldstop IGBT4, enlarged Emitter Controlled 4 diode

**暫定データ / Preliminary Data**



$V_{CES} = 1200V$   
 $I_{C\ nom} = 1400A / I_{CRM} = 2800A$

**一般応用**

- チョッパアプリケーション

**電気的特性**

- 拡張された動作温度  $T_{vj\ op}$
- 高いDC電圧での安定性
- 高い短絡電流耐量、自己抑制型短絡電流
- 正温度特性を持った  $V_{CESat}$  飽和電圧
- 低  $V_{CESat}$  飽和電圧

**機械的特性**

- 4 kV AC 1分 絶縁耐圧
- CTI(比較トラッキング指数) >400のモジュールパッケージ
- 長い縁面/空間距離
- 高いパワー/サーマルサイクル耐量
- 高いパワー密度
- 低熱インピーダンスのDCB

**Typical Applications**

- Chopper Applications

**Electrical Features**

- Extended Operation Temperature  $T_{vj\ op}$
- High DC Stability
- High Short Circuit Capability, Self Limiting Short Circuit Current
- $V_{CESat}$  with positive Temperature Coefficient
- Low  $V_{CESat}$

**Mechanical Features**

- 4 kV AC 1min Insulation
- Package with CTI > 400
- High Creepage and Clearance Distances
- High Power and Thermal Cycling Capability
- High Power Density
- Substrate for Low Thermal Resistance

**Module Label Code**

**Barcode Code 128**



**DMX - Code**



**Content of the Code**

| Content of the Code        | Digit   |
|----------------------------|---------|
| Module Serial Number       | 1 - 5   |
| Module Material Number     | 6 - 11  |
| Production Order Number    | 12 - 19 |
| Datecode (Production Year) | 20 - 21 |
| Datecode (Production Week) | 22 - 23 |

|                 |                                 |                      |
|-----------------|---------------------------------|----------------------|
| prepared by: AC | date of publication: 2013-11-05 |                      |
| approved by: MS | revision: 2.3                   | UL approved (E83335) |



暫定データ  
Preliminary Data

IGBT、チョッパ / IGBT-Chopper  
最大定格 / Maximum Rated Values

|  |   |                   |       |    |
|--|---|-------------------|-------|----|
| コレクタ・エミッタ間電圧<br>Collector-emitter voltage          | $T_{vj} = 25^{\circ}\text{C}$                                 | $V_{CES}$         | 1200  | V  |
| 連続DCコレクタ電流<br>Continuous DC collector current      | $T_C = 100^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$ | $I_{C\text{nom}}$ | 1400  | A  |
| 繰り返しピークコレクタ電流<br>Repetitive peak collector current | $t_P = 1\text{ms}$  | $I_{CRM}$         | 2800  | A  |
| トータル損失<br>Total power dissipation                  | $T_C = 25^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$  | $P_{\text{tot}}$  | 7,70  | kW |
| ゲート・エミッタ間ピーク電圧<br>Gate-emitter peak voltage        |   | $V_{GES}$         | +/-20 | V  |

電気的特性 / Characteristic Values

|   |   |   | min.               | typ.                 | max. |             |   |
|---|---|---|--------------------|----------------------|------|-------------|---|
| コレクタ・エミッタ間飽和電圧<br>Collector-emitter saturation voltage  | $I_C = 1400\text{A}, V_{GE} = 15\text{V}$<br>$I_C = 1400\text{A}, V_{GE} = 15\text{V}$<br>$I_C = 1400\text{A}, V_{GE} = 15\text{V}$   | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $V_{CE\text{sat}}$ | 1,75<br>2,05<br>2,15 | 2,10 | V<br>V<br>V |   |
| ゲート・エミッタ間しきい値電圧<br>Gate threshold voltage               | $I_C = 49,0\text{mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$   |   | $V_{GEth}$         | 5,0                  | 5,8  | 6,5         | V   |
| ゲート電荷量<br>Gate charge                                   | $V_{GE} = -15\text{V} \dots +15\text{V}$  |   | $Q_G$              | 9,60                 |      |             | $\mu\text{C}$                                   |
| 内蔵ゲート抵抗<br>Internal gate resistor                       | $T_{vj} = 25^{\circ}\text{C}$   |   | $R_{Gint}$         | 0,8                  |      |             | $\Omega$  |
| 入力容量<br>Input capacitance                               | $f = 1\text{MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{V}, V_{GE} = 0\text{V}$   |   | $C_{ies}$          | 82,0                 |      |             | nF  |
| 帰還容量<br>Reverse transfer capacitance                    | $f = 1\text{MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{V}, V_{GE} = 0\text{V}$   |   | $C_{res}$          | 4,60                 |      |             | nF  |
| コレクタ・エミッタ間遮断電流<br>Collector-emitter cut-off current     | $V_{CE} = 1200\text{V}, V_{GE} = 0\text{V}, T_{vj} = 25^{\circ}\text{C}$  |   | $I_{CES}$          |                      |      | 5,0         | mA  |
| ゲート・エミッタ間漏れ電流<br>Gate-emitter leakage current           | $V_{CE} = 0\text{V}, V_{GE} = 20\text{V}, T_{vj} = 25^{\circ}\text{C}$  |   | $I_{GES}$          |                      |      | 400         | nA  |
| ターンオン遅れ時間 (誘導負荷)<br>Turn-on delay time, inductive load  | $I_C = 1400\text{A}, V_{CE} = 600\text{V}$<br>$V_{GE} = \pm 15\text{V}$<br>$R_{Gon} = 1,0\Omega$  | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $t_{don}$          | 0,20<br>0,21<br>0,21 |      |             | $\mu\text{s}$<br>$\mu\text{s}$<br>$\mu\text{s}$ |
| ターンオン上昇時間 (誘導負荷)<br>Rise time, inductive load           | $I_C = 1400\text{A}, V_{CE} = 600\text{V}$<br>$V_{GE} = \pm 15\text{V}$<br>$R_{Gon} = 1,0\Omega$  | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $t_r$              | 0,12<br>0,13<br>0,13 |      |             | $\mu\text{s}$<br>$\mu\text{s}$<br>$\mu\text{s}$ |
| ターンオフ遅れ時間 (誘導負荷)<br>Turn-off delay time, inductive load | $I_C = 1400\text{A}, V_{CE} = 600\text{V}$<br>$V_{GE} = \pm 15\text{V}$<br>$R_{Goff} = 1,0\Omega$   | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $t_{doff}$         | 0,87<br>0,95<br>0,97 |      |             | $\mu\text{s}$<br>$\mu\text{s}$<br>$\mu\text{s}$ |
| ターンオフ下降時間 (誘導負荷)<br>Fall time, inductive load           | $I_C = 1400\text{A}, V_{CE} = 600\text{V}$<br>$V_{GE} = \pm 15\text{V}$<br>$R_{Goff} = 1,0\Omega$   | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $t_f$              | 0,20<br>0,23<br>0,23 |      |             | $\mu\text{s}$<br>$\mu\text{s}$<br>$\mu\text{s}$ |
| ターンオンスイッチング損失<br>Turn-on energy loss per pulse          | $I_C = 1400\text{A}, V_{CE} = 600\text{V}, L_S = 30\text{nH}$<br>$V_{GE} = \pm 15\text{V}, di/dt = 8600\text{A}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$<br>$R_{Gon} = 1,0\Omega$  | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $E_{on}$           | 65,0<br>80,0<br>95,0 |      |             | mJ<br>mJ<br>mJ                                  |
| ターンオフスイッチング損失<br>Turn-off energy loss per pulse         | $I_C = 1400\text{A}, V_{CE} = 600\text{V}, L_S = 30\text{nH}$<br>$V_{GE} = \pm 15\text{V}, du/dt = 2700\text{V}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$<br>$R_{Goff} = 1,0\Omega$ | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $E_{off}$          | 180<br>250<br>280    |      |             | mJ<br>mJ<br>mJ                                  |
| 短絡電流<br>SC data   | $V_{GE} \leq 15\text{V}, V_{CC} = 800\text{V}$<br>$V_{CE\text{max}} = V_{CES} - L_{SCE} \cdot di/dt$ $t_P \leq 10\mu\text{s}, T_{vj} = 150^{\circ}\text{C}$                           |   | $I_{SC}$           | 5600                 |      |             | A   |
| ジャンクション・ケース間熱抵抗<br>Thermal resistance, junction to case | IGBT部 ( 1素子当り ) / per IGBT  |   | $R_{thJC}$         |                      |      | 19,5        | K/kW  |
| ケース・ヒートシンク間熱抵抗<br>Thermal resistance, case to heatsink  | IGBT部 ( 1素子当り ) / per IGBT<br>$\lambda_{\text{Paste}} = 1\text{W}/(\text{m}\cdot\text{K})$ / $\lambda_{\text{grease}} = 1\text{W}/(\text{m}\cdot\text{K})$                            |   | $R_{thCH}$         | 9,30                 |      |             | K/kW  |
| 動作温度<br>Temperature under switching conditions          |   |   | $T_{vj\text{op}}$  | -40                  |      | 150         | $^{\circ}\text{C}$                              |

|                 |                                 |
|-----------------|---------------------------------|
| prepared by: AC | date of publication: 2013-11-05 |
| approved by: MS | revision: 2.3                   |



暫定データ  
Preliminary Data

Diode-、チヨツパー / Diode-Chopper  
最大定格 / Maximum Rated Values

|  |  |           |            |  |
|--|--|-----------|------------|--|
| ピーク繰返し逆電圧<br>Repetitive peak reverse voltage | $T_{vj} = 25^{\circ}\text{C}$  | $V_{RRM}$ | 1200       | V                                      |
| 連続DC電流<br>Continuous DC forward current      |  | $I_F$     | 1400       | A                                      |
| ピーク繰返し順電流<br>Repetitive peak forward current | $t_P = 1\text{ ms}$  | $I_{FRM}$ | 2800       | A                                      |
| 電流二乗時間積<br>$I^2t$ - value                    | $V_R = 0\text{ V}, t_P = 10\text{ ms}, T_{vj} = 125^{\circ}\text{C}$<br>$V_R = 0\text{ V}, t_P = 10\text{ ms}, T_{vj} = 150^{\circ}\text{C}$ | $I^2t$    | 270<br>260 | kA <sup>2</sup> s<br>kA <sup>2</sup> s |

電気的特性 / Characteristic Values

|   |   |   | min.        | typ.                 | max. |   |
|---|---|---|-------------|----------------------|------|---|
| 順電圧<br>Forward voltage                                  | $I_F = 1400\text{ A}, V_{GE} = 0\text{ V}$<br>$I_F = 1400\text{ A}, V_{GE} = 0\text{ V}$<br>$I_F = 1400\text{ A}, V_{GE} = 0\text{ V}$          | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $V_F$       | 1,65<br>1,55<br>1,55 | 2,15 | V<br>V<br>V                                     |
| ピーク逆回復電流<br>Peak reverse recovery current               | $I_F = 1400\text{ A}, -di_F/dt = 8600\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$<br>$V_R = 600\text{ V}$                                | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $I_{RM}$    | 1000<br>1200<br>1250 |      | A<br>A<br>A                                     |
| 逆回復電荷量<br>Recovered charge                              | $I_F = 1400\text{ A}, -di_F/dt = 8600\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$<br>$V_R = 600\text{ V}$                                | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $Q_r$       | 170<br>300<br>330    |      | $\mu\text{C}$<br>$\mu\text{C}$<br>$\mu\text{C}$ |
| 逆回復損失<br>Reverse recovery energy                        | $I_F = 1400\text{ A}, -di_F/dt = 8600\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$<br>$V_R = 600\text{ V}$                                | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $E_{rec}$   | 80,0<br>140<br>160   |      | mJ<br>mJ<br>mJ                                  |
| ジャンクション・ケース間熱抵抗<br>Thermal resistance, junction to case | /Diode ( 1 素子当り ) / per diode   |   | $R_{thJC}$  |                      | 25,0 | K/kW  |
| ケース・ヒートシンク間熱抵抗<br>Thermal resistance, case to heatsink  | /Diode ( 1 素子当り ) / per diode<br>$\lambda_{Paste} = 1\text{ W}/(\text{m}\cdot\text{K}) / \lambda_{grease} = 1\text{ W}/(\text{m}\cdot\text{K})$ |   | $R_{thCH}$  | 17,0                 |      | K/kW  |
| 動作温度<br>Temperature under switching conditions          |   |   | $T_{vj op}$ | -40                  | 150  | $^{\circ}\text{C}$                              |

Diode、リバーズ / Diode, Reverse  
最大定格 / Maximum Rated Values

|  |  |           |      |                   |
|--|--|-----------|------|-------------------|
| ピーク繰返し逆電圧<br>Repetitive peak reverse voltage | $T_{vj} = 25^{\circ}\text{C}$  | $V_{RRM}$ | 1200 | V                 |
| 連続DC電流<br>Continuous DC forward current      |  | $I_F$     | 180  | A                 |
| ピーク繰返し順電流<br>Repetitive peak forward current | $t_P = 1\text{ ms}$  | $I_{FRM}$ | 360  | A                 |
| 電流二乗時間積<br>$I^2t$ - value                    | $V_R = 0\text{ V}, t_P = 10\text{ ms}, T_{vj} = 125^{\circ}\text{C}$ | $I^2t$    | 0,23 | kA <sup>2</sup> s |

電気的特性 / Characteristic Values

|   |   |   | min.        | typ.         | max. |                    |
|---|---|---|-------------|--------------|------|--------------------|
| 順電圧<br>Forward voltage                                  | $I_F = 180\text{ A}, V_{GE} = 0\text{ V}$<br>$I_F = 180\text{ A}, V_{GE} = 0\text{ V}$  | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$ | $V_F$       | 1,65<br>1,65 | 2,15 | V<br>V             |
| ジャンクション・ケース間熱抵抗<br>Thermal resistance, junction to case | /Diode ( 1 素子当り ) / per diode   |   | $R_{thJC}$  |              | 225  | K/kW               |
| ケース・ヒートシンク間熱抵抗<br>Thermal resistance, case to heatsink  | /Diode ( 1 素子当り ) / per diode<br>$\lambda_{Paste} = 1\text{ W}/(\text{m}\cdot\text{K}) / \lambda_{grease} = 1\text{ W}/(\text{m}\cdot\text{K})$ |   | $R_{thCH}$  | 120          |      | K/kW               |
| 動作温度<br>Temperature under switching conditions          |   |   | $T_{vj op}$ | -40          | 150  | $^{\circ}\text{C}$ |

|                 |                                 |
|-----------------|---------------------------------|
| prepared by: AC | date of publication: 2013-11-05 |
| approved by: MS | revision: 2.3                   |



暫定データ  
Preliminary Data

NTC-サーミスタ / NTC-Thermistor  
電気的特性 / Characteristic Values

|                              |  |              | min. | typ. | max. |            |
|------------------------------|--|--------------|------|------|------|------------|
| 定格抵抗値<br>Rated resistance    | $T_C = 25^\circ\text{C}$                                       | $R_{25}$     |      | 5,00 |      | k $\Omega$ |
| R100の偏差<br>Deviation of R100 | $T_C = 100^\circ\text{C}, R_{100} = 493 \Omega$                | $\Delta R/R$ | -5   |      | 5    | %          |
| 損失<br>Power dissipation      | $T_C = 25^\circ\text{C}$                                       | $P_{25}$     |      |      | 20,0 | mW         |
| B-定数<br>B-value              | $R_2 = R_{25} \exp [B_{25/50}(1/T_2 - 1/(298,15 \text{ K}))]$  | $B_{25/50}$  |      | 3375 |      | K          |
| B-定数<br>B-value              | $R_2 = R_{25} \exp [B_{25/80}(1/T_2 - 1/(298,15 \text{ K}))]$  | $B_{25/80}$  |      | 3411 |      | K          |
| B-定数<br>B-value              | $R_2 = R_{25} \exp [B_{25/100}(1/T_2 - 1/(298,15 \text{ K}))]$ | $B_{25/100}$ |      | 3433 |      | K          |

適切なアプリケーションノートによる仕様  
Specification according to the valid application note.

モジュール / Module

|   |  |             |            |                         |           |                  |
|---|--|-------------|------------|-------------------------|-----------|------------------|
| 絶縁耐圧<br>Isolation test voltage                              | RMS, f = 50 Hz, t = 1 min.   | $V_{ISOL}$  |            | 4,0                     |           | kV               |
| ベースプレート材質<br>Material of module baseplate                   |  |             |            | Cu                      |           |                  |
| 内部絶縁<br>Internal isolation                                  | 基礎絶縁 (クラス1, IEC 61140)<br>basic insulation (class 1, IEC 61140)  |             |            | $\text{Al}_2\text{O}_3$ |           |                  |
| 沿面距離<br>Creepage distance                                   | 連絡方法 - ヒートシンク / terminal to heatsink<br>連絡方法 - 連絡方法 / terminal to terminal   |             |            | 33,0<br>33,0            |           | mm               |
| 空間距離<br>Clearance   | 連絡方法 - ヒートシンク / terminal to heatsink<br>連絡方法 - 連絡方法 / terminal to terminal   |             |            | 19,0<br>19,0            |           | mm               |
| 相対トラッキング指数<br>Comperative tracking index                    |  | CTI         |            | > 400                   |           |                  |
|   |  |             | min.       | typ.                    | max.      |                  |
| 内部インダクタンス<br>Stray inductance module                        |  | $L_{SCE}$   |            | 10                      |           | nH               |
| パワーターミナル・チップ間抵抗<br>Module lead resistance, terminals - chip | $T_C = 25^\circ\text{C}, / \text{スイッチ} / \text{per switch}$  | $R_{CC+EE}$ |            | 0,20                    |           | m $\Omega$       |
| 保存温度<br>Storage temperature                                 |  | $T_{stg}$   | -40        |                         | 150       | $^\circ\text{C}$ |
| 取り付けネジ締め付けトルク<br>Mounting torque for modul mounting         | 取り付けネジ M5<br>適切なアプリケーションノートによるマウンティング<br>Screw M5 - Mounting according to valid application note   | M           | 3,00       | -                       | 6,00      | Nm               |
| 主端子ネジ締め付けトルク<br>Terminal connection torque                  | 取り付けネジ M4<br>適切なアプリケーションノートによるマウンティング<br>Screw M4 - Mounting according to valid application note<br>取り付けネジ M8<br>適切なアプリケーションノートによるマウンティング<br>Screw M8 - Mounting according to valid application note | M           | 1,8<br>8,0 | -<br>-                  | 2,1<br>10 | Nm<br>Nm         |
| 質量<br>Weight  |  | G           |            | 1200                    |           | g                |

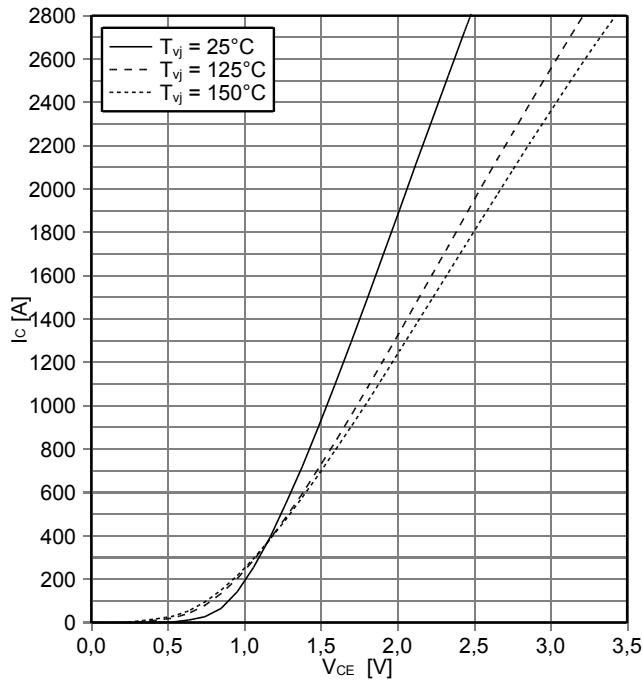
|                 |                                 |
|-----------------|---------------------------------|
| prepared by: AC | date of publication: 2013-11-05 |
| approved by: MS | revision: 2.3                   |



暫定データ  
Preliminary Data

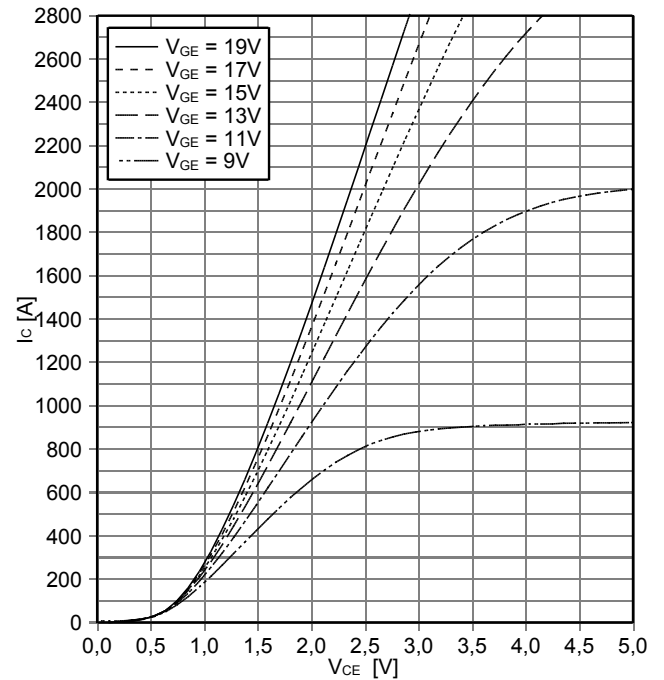
出力特性 IGBT、チヨッパ- (Typical)  
output characteristic IGBT-Chopper (typical)

$I_C = f(V_{CE})$   
 $V_{GE} = 15\text{ V}$



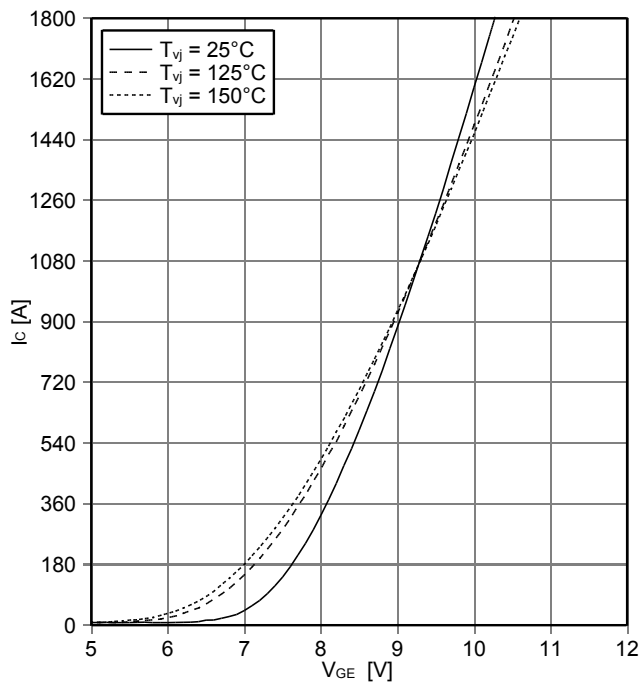
出力特性 IGBT、チヨッパ- (Typical)  
output characteristic IGBT-Chopper (typical)

$I_C = f(V_{CE})$   
 $T_{vj} = 150^\circ\text{C}$



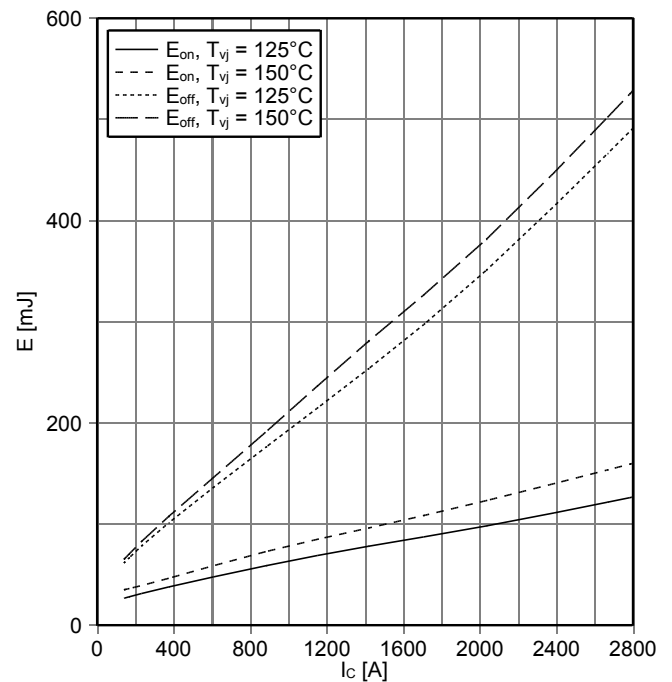
伝達特性 IGBT、チヨッパ- (Typical)  
transfer characteristic IGBT-Chopper (typical)

$I_C = f(V_{GE})$   
 $V_{CE} = 20\text{ V}$



スイッチング損失 IGBT、チヨッパ- (Typical)  
switching losses IGBT-Chopper (typical)

$E_{on} = f(I_C)$ ,  $E_{off} = f(I_C)$   
 $V_{GE} = \pm 15\text{ V}$ ,  $R_{Gon} = 1\ \Omega$ ,  $R_{Goff} = 1\ \Omega$ ,  $V_{CE} = 600\text{ V}$



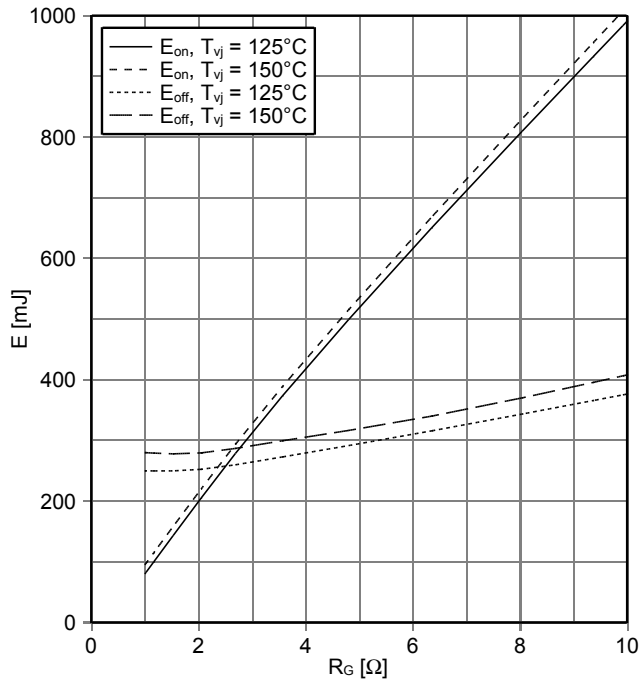
|                 |                                 |
|-----------------|---------------------------------|
| prepared by: AC | date of publication: 2013-11-05 |
| approved by: MS | revision: 2.3                   |



暫定データ  
Preliminary Data

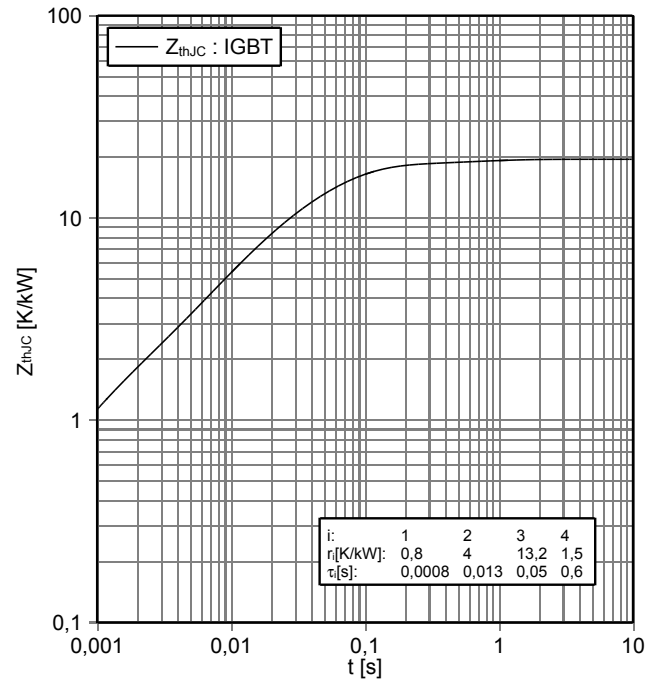
スイッチング損失 IGBT、チョッパー (Typical)  
switching losses IGBT-Chopper (typical)

$E_{on} = f(R_G)$ ,  $E_{off} = f(R_G)$   
 $V_{GE} = \pm 15\text{ V}$ ,  $I_C = 1400\text{ A}$ ,  $V_{CE} = 600\text{ V}$



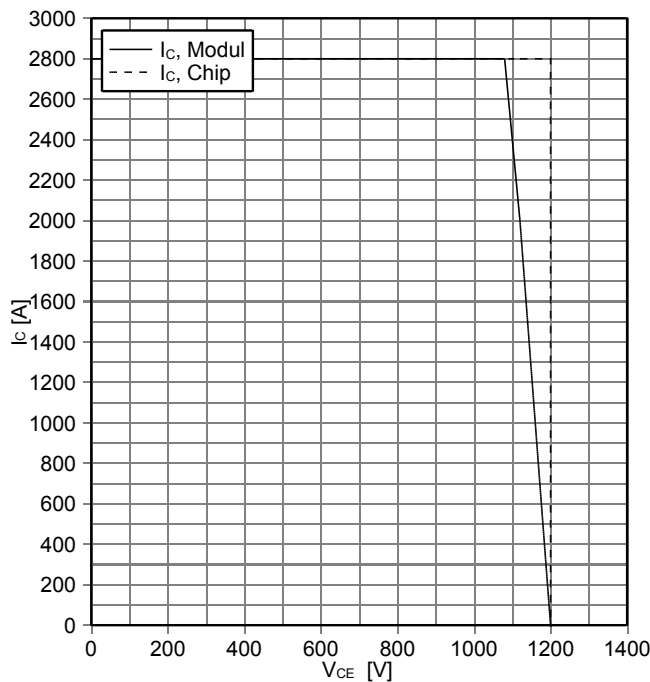
過渡熱インピーダンス IGBT、チョッパー  
transient thermal impedance IGBT-Chopper

$Z_{thJC} = f(t)$



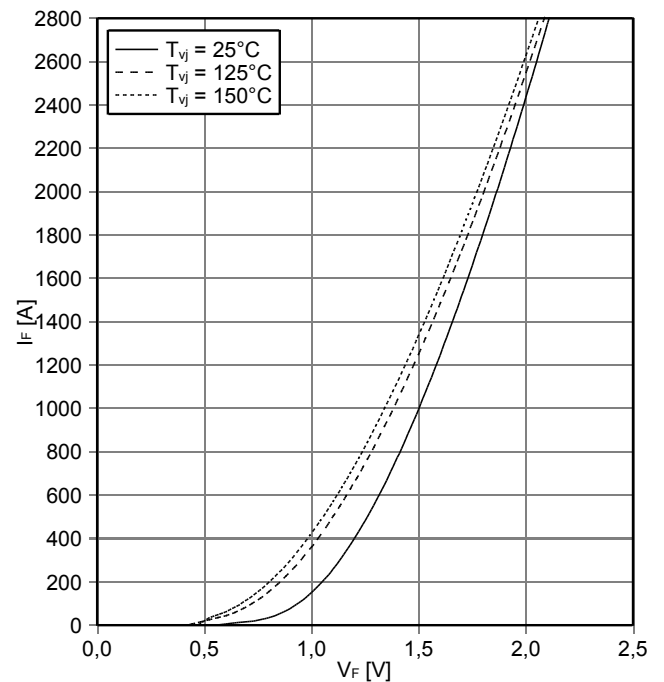
逆バイアス安全動作領域 IGBT、チョッパー (RBSOA)  
reverse bias safe operating area IGBT-Chopper (RBSOA)

$I_C = f(V_{CE})$   
 $V_{GE} = \pm 15\text{ V}$ ,  $R_{Goff} = 1\ \Omega$ ,  $T_{vj} = 150^\circ\text{C}$



順電圧特性 Diode-, チョッパー (typical)  
forward characteristic of Diode-Chopper (typical)

$I_F = f(V_F)$



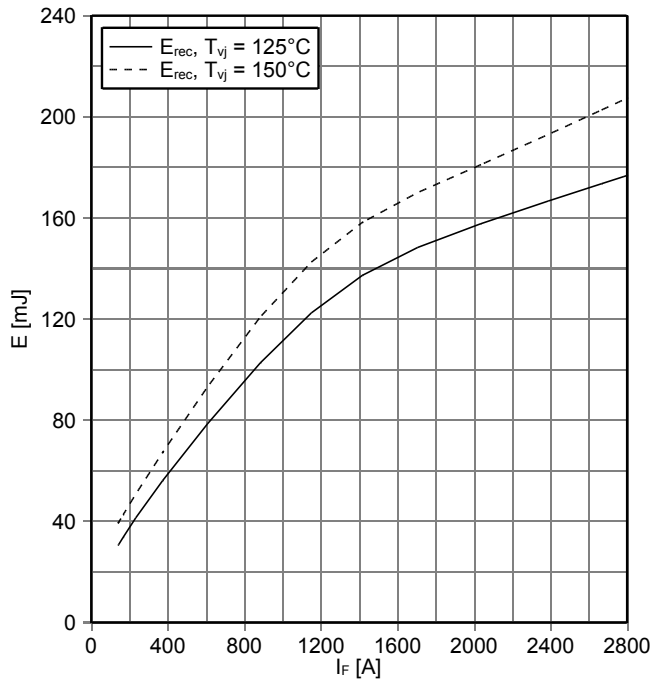
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|-----------------|---------------------------------|
| prepared by: AC | date of publication: 2013-11-05 |
| approved by: MS | revision: 2.3                   |



暫定データ  
Preliminary Data

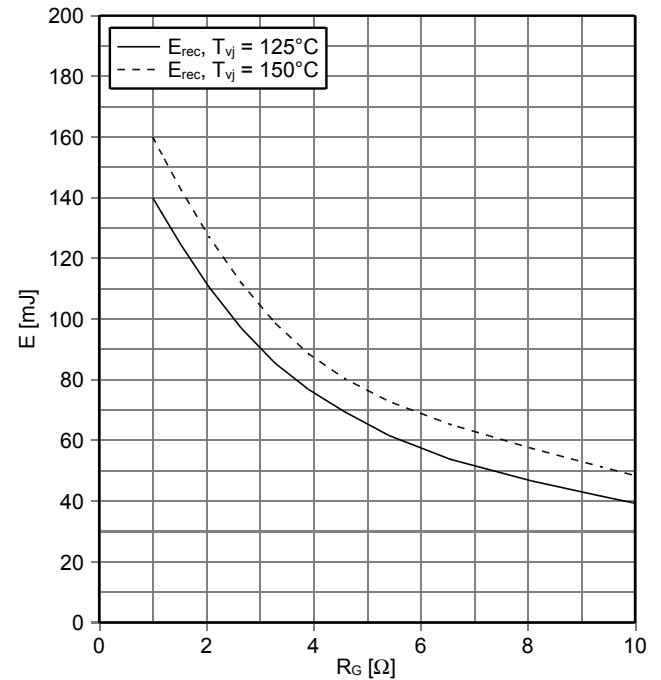
スイッチング損失 Diode-, チョッパー (Typical)  
switching losses Diode-Chopper (typical)

$E_{rec} = f(I_F)$   
 $R_{Gon} = 1 \Omega, V_{CE} = 600 V$



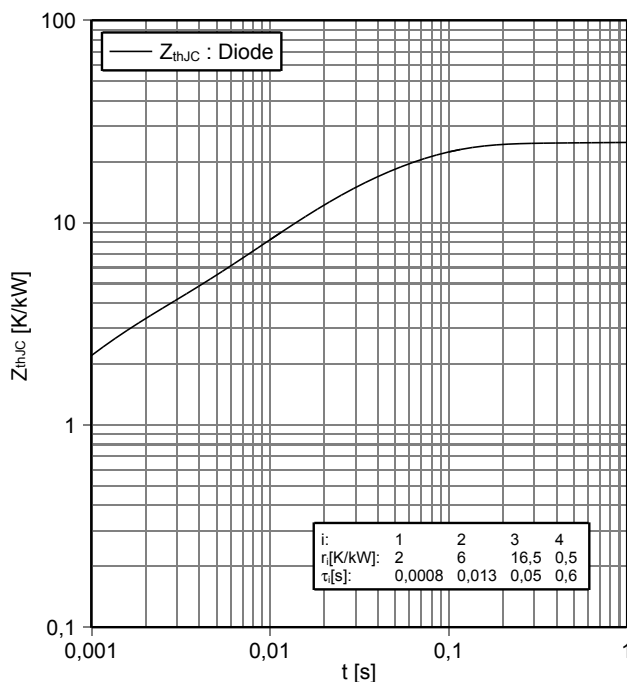
スイッチング損失 Diode-, チョッパー (Typical)  
switching losses Diode-Chopper (typical)

$E_{rec} = f(R_G)$   
 $I_F = 1400 A, V_{CE} = 600 V$



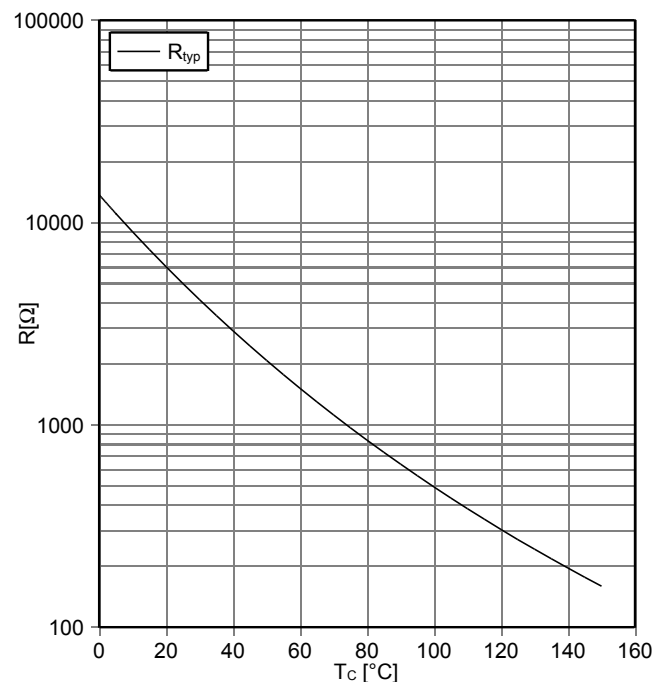
過渡熱インピーダンス Diode-, チョッパー  
transient thermal impedance Diode-Chopper

$Z_{thJC} = f(t)$



NTC-サーミスタ サーミスタの温度特性  
NTC-Thermistor-temperature characteristic (typical)

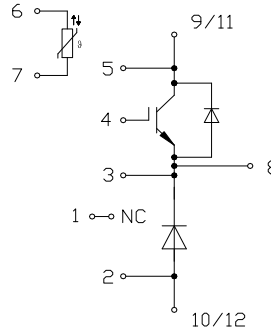
$R = f(T)$



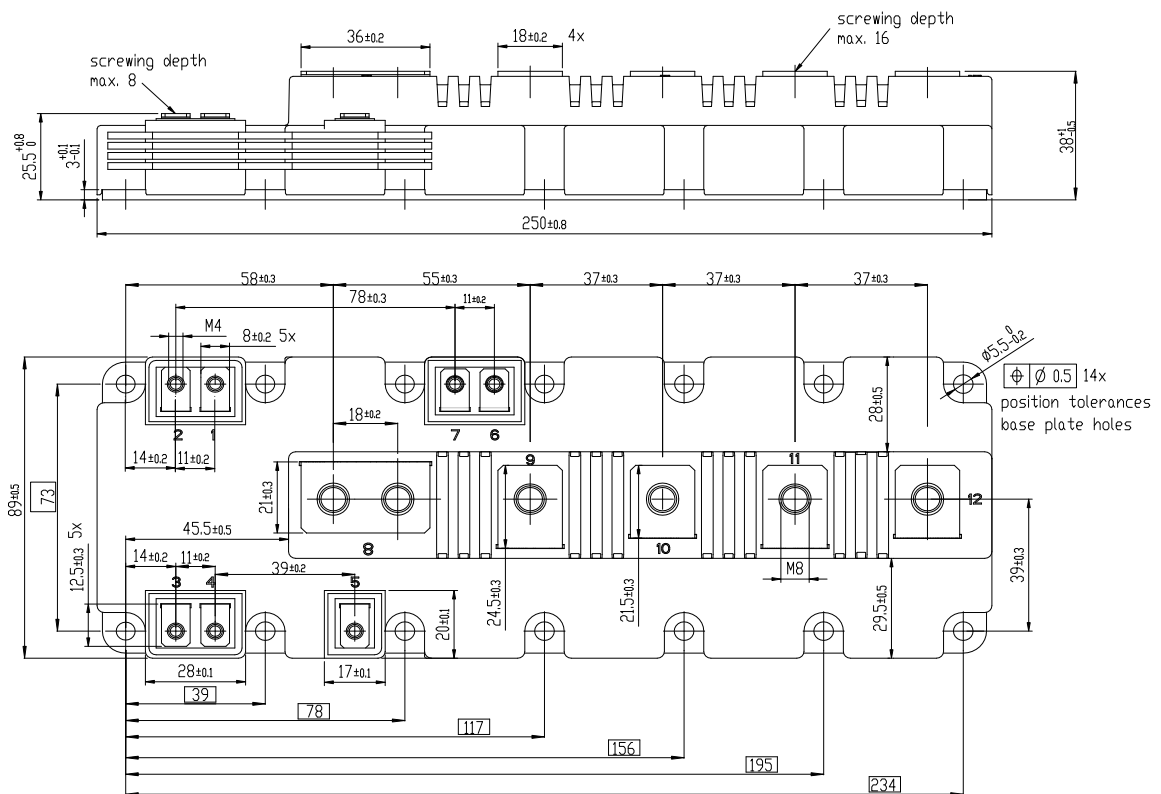
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Preliminary Data

回路図 / circuit\_diagram\_headline



パッケージ概要 / package outlines



|                 |                                 |
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