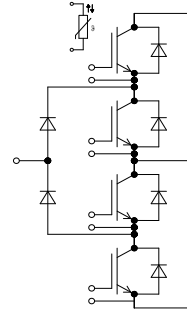
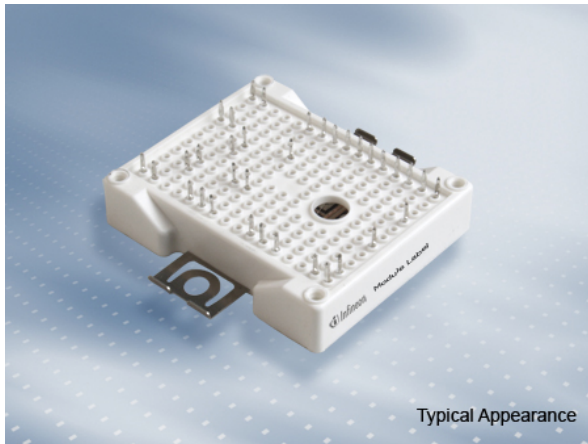


EasyPACK™ モジュール TRENCHSTOP™ 5 とCoolSiC™ ショットキーダイオード内蔵 とpressFIT / 予め塗布されたサーマルインターフェース材料

EasyPACK™ module with TRENCHSTOP™ 5 and CoolSiC™ Schottky diode and PressFIT / pre-applied Thermal Interface Material



$V_{CES} = 650V$
 $I_{C\ nom} = 100A / I_{CRM} = 200A$

アプリケーションの可能性

- 3レベル アプリケーション
- UPSシステム
- ソーラーアプリケーション
- モーター駆動

Potential Applications

- 3-level-applications
- UPS systems
- Solar applications
- Motor drives

電気的特性

- 650Vに増加したブロッキング電圧
- CoolSiC™ ショットキーダイオード gen5
- 低スイッチング損失

Electrical Features

- Increased blocking voltage capability up to 650V
- CoolSiC™ Schottky diode gen 5
- Low switching losses

機械的特性

- PressFIT 接合 技術
- コンパクトデザイン
- 予め塗布されたサーマルインターフェース材料
- 低熱インピーダンスの Al_2O_3 DCB
- 固定用クランプによる強固なマウンティング

Mechanical Features

- PressFIT contact technology
- Compact design
- Pre-applied Thermal Interface Material
- Al_2O_3 substrate with low thermal resistance
- Rugged mounting due to integrated mounting clamps

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

IGBT, T1 / T4 / IGBT, T1 / T4
最大定格 / Maximum Rated Values

コレクタ・エミッタ間電圧 Collector-emitter voltage	$T_{vj} = 25^{\circ}\text{C}$	V_{CES}	650	V
コレクタ電流 Implemented collector current		I_{CN}	200	A
連続DCコレクタ電流 Continuous DC collector current	$T_H = 65^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$	I_{CDC}	110	A
繰り返しピークコレクタ電流 Repetitive peak collector current	$t_p = 1\text{ ms}$	I_{CRM}	400	A
ゲート・エミッタ間ピーク電圧 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 Collector-emitter saturation voltage	$I_C = 100\text{ A}$ $V_{GE} = 15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$V_{CE\text{ sat}}$	1,17 1,20 1,21	1,38 V V V
ゲート・エミッタ間しきい値電圧 Gate threshold voltage	$I_C = 2,40\text{ mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$		V_{Geth}	3,25 4,00 4,75	V
ゲート電荷量 Gate charge	$V_{GE} = -15 / 15\text{ V}, V_{CE} = 400\text{ V}$		Q_G	0,84	μC
内蔵ゲート抵抗 Internal gate resistor	$T_{vj} = 25^{\circ}\text{C}$		R_{Gint}	0,0	Ω
入力容量 Input capacitance	$f = 100\text{ kHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}$		C_{ies}	14,3	nF
帰還容量 Reverse transfer capacitance	$f = 100\text{ kHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}$		C_{res}	0,05	nF
コレクタ・エミッタ間遮断電流 Collector-emitter cut-off current	$V_{CE} = 650\text{ V}, V_{GE} = 0\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$	I_{CES}		1,0 mA
ゲート・エミッタ間漏れ電流 Gate-emitter leakage current	$V_{CE} = 0\text{ V}, V_{GE} = 20\text{ V}, T_{vj} = 25^{\circ}\text{C}$		I_{GES}		100 nA
ターンオン遅れ時間 (誘導負荷) Turn-on delay time, inductive load	$I_C = 100\text{ A}, V_{CE} = 300\text{ V}$ $V_{GE} = -15 / 15\text{ V}$ $R_{Gon} = 5,1\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	t_{don}	0,0269 0,0272 0,0276	μs μs μs
ターンオン上昇時間 (誘導負荷) Rise time, inductive load	$I_C = 100\text{ A}, V_{CE} = 300\text{ V}$ $V_{GE} = -15 / 15\text{ V}$ $R_{Gon} = 5,1\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	t_r	0,0114 0,0182 0,0194	μs μs μs
ターンオフ遅れ時間 (誘導負荷) Turn-off delay time, inductive load	$I_C = 100\text{ A}, V_{CE} = 300\text{ V}$ $V_{GE} = -15 / 15\text{ V}$ $R_{Goff} = 39\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	t_{doff}	0,63 0,67 0,70	μs μs μs
ターンオフ下降時間 (誘導負荷) Fall time, inductive load	$I_C = 100\text{ A}, V_{CE} = 300\text{ V}$ $V_{GE} = -15 / 15\text{ V}$ $R_{Goff} = 39\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	t_f	0,03 0,032 0,034	μs μs μs
ターンオンスイッチング損失 Turn-on energy loss per pulse	$I_C = 100\text{ A}, V_{CE} = 300\text{ V}, L\sigma = 35\text{ nH}$ $di/dt = 5500\text{ A}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$ $V_{GE} = -15 / 15\text{ V}, R_{Gon} = 5,1\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	E_{on}	1,70 2,60 2,75	mJ mJ mJ
ターンオフスイッチング損失 Turn-off energy loss per pulse	$I_C = 100\text{ A}, V_{CE} = 300\text{ V}, L\sigma = 35\text{ nH}$ $du/dt = 3500\text{ V}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$ $V_{GE} = -15 / 15\text{ V}, R_{Goff} = 39\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	E_{off}	1,16 1,55 1,74	mJ mJ mJ
短絡電流 SC data	$V_{GE} \leq 15\text{ V}, V_{CC} = 360\text{ V}$ $V_{CE\max} = V_{CES} - L_{SCE} \cdot di/dt$ $t_p \leq 0\ \mu\text{s}, T_{vj} = 150^{\circ}\text{C}$		I_{SC}	1600	A
ジャンクション・ヒートシンク間熱抵抗 Thermal resistance, junction to heatsink	IGBT部 (1素子当り) / per IGBT		R_{thJH}		0,655 K/W
動作温度 Temperature under switching conditions			$T_{vj\text{ op}}$	-40	150 $^{\circ}\text{C}$

IGBT, T2 / T3 / IGBT, T2 / T3
最大定格 / Maximum Rated Values

コレクタ・エミッタ間電圧 Collector-emitter voltage	$T_{vj} = 25^{\circ}\text{C}$	V_{CES}	650	V
コレクタ電流 Implemented collector current		I_{CN}	200	A
連続DCコレクタ電流 Continuous DC collector current	$T_H = 65^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$	I_{CDC}	110	A
繰り返しピークコレクタ電流 Repetitive peak collector current	$t_p = 1\text{ ms}$	I_{CRM}	400	A
ゲート・エミッタ間ピーク電圧 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 Collector-emitter saturation voltage	$I_C = 100\text{ A}$ $V_{GE} = 15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$V_{CE\text{ sat}}$	1,17 1,20 1,21	1,38 V V V
ゲート・エミッタ間しきい値電圧 Gate threshold voltage	$I_C = 2,40\text{ mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$		V_{Geth}	3,25 4,00 4,75	V
ゲート電荷量 Gate charge	$V_{GE} = -15 / 15\text{ V}, V_{CE} = 400\text{ V}$		Q_G	0,84	μC
内蔵ゲート抵抗 Internal gate resistor	$T_{vj} = 25^{\circ}\text{C}$		R_{Gint}	0,0	Ω
入力容量 Input capacitance	$f = 100\text{ kHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}$		C_{ies}	14,3	nF
帰還容量 Reverse transfer capacitance	$f = 100\text{ kHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}$		C_{res}	0,05	nF
コレクタ・エミッタ間遮断電流 Collector-emitter cut-off current	$V_{CE} = 650\text{ V}, V_{GE} = 0\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$	I_{CES}		0,004 mA
ゲート・エミッタ間漏れ電流 Gate-emitter leakage current	$V_{CE} = 0\text{ V}, V_{GE} = 20\text{ V}, T_{vj} = 25^{\circ}\text{C}$		I_{GES}		100 nA
ターンオン遅れ時間 (誘導負荷) Turn-on delay time, inductive load	$I_C = 100\text{ A}, V_{CE} = 300\text{ V}$ $V_{GE} = -15 / 15\text{ V}$ $R_{Gon} = 5,1\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	t_{don}	0,0269 0,0272 0,0276	μs μs μs
ターンオン上昇時間 (誘導負荷) Rise time, inductive load	$I_C = 100\text{ A}, V_{CE} = 300\text{ V}$ $V_{GE} = -15 / 15\text{ V}$ $R_{Gon} = 5,1\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	t_r	0,0114 0,0182 0,0194	μs μs μs
ターンオフ遅れ時間 (誘導負荷) Turn-off delay time, inductive load	$I_C = 100\text{ A}, V_{CE} = 300\text{ V}$ $V_{GE} = -15 / 15\text{ V}$ $R_{Goff} = 39\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	t_{doff}	0,63 0,67 0,70	μs μs μs
ターンオフ下降時間 (誘導負荷) Fall time, inductive load	$I_C = 100\text{ A}, V_{CE} = 300\text{ V}$ $V_{GE} = -15 / 15\text{ V}$ $R_{Goff} = 39\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	t_f	0,03 0,032 0,034	μs μs μs
ターンオンスイッチング損失 Turn-on energy loss per pulse	$I_C = 100\text{ A}, V_{CE} = 300\text{ V}, L\sigma = 35\text{ nH}$ $di/dt = 3500\text{ A}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$ $V_{GE} = -15 / 15\text{ V}, R_{Gon} = 5,1\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	E_{on}	0,52 0,59 0,61	mJ mJ mJ
ターンオフスイッチング損失 Turn-off energy loss per pulse	$I_C = 100\text{ A}, V_{CE} = 300\text{ V}, L\sigma = 35\text{ nH}$ $du/dt = 3500\text{ V}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$ $V_{GE} = -15 / 15\text{ V}, R_{Goff} = 39\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	E_{off}	1,16 1,55 1,74	mJ mJ mJ
短絡電流 SC data	$V_{GE} \leq 15\text{ V}, V_{CC} = 360\text{ V}$ $V_{CE\max} = V_{CES} - L_{sCE} \cdot di/dt$ $t_p \leq 0\ \mu\text{s}, T_{vj} = 150^{\circ}\text{C}$		I_{SC}	1600	A
ジャンクション・ヒートシンク間熱抵抗 Thermal resistance, junction to heatsink	IGBT部 (1素子当り) / per IGBT		R_{thJH}		0,655 K/W
動作温度 Temperature under switching conditions			$T_{vj\text{ op}}$	-40	150 $^{\circ}\text{C}$

ダイオード, D1 / D4 / Diode, D1 / D4

最大定格 / Maximum Rated Values

ピーク繰返し逆電圧 Repetitive peak reverse voltage	$T_{vj} = 25^{\circ}\text{C}$	V_{RRM}	650	V
順電流 Implemented forward current		I_{FN}	120	A
連続DC電流 Continuous DC forward current		I_F	100	A
ピーク繰返し順電流 Repetitive peak forward current	$t_p = 1\text{ ms}$	I_{FRM}	240	A
電流二乗時間積 I^2t - value	$V_R = 0\text{ V}, t_p = 10\text{ ms}, T_{vj} = 125^{\circ}\text{C}$ $V_R = 0\text{ V}, t_p = 10\text{ ms}, T_{vj} = 150^{\circ}\text{C}$	I^2t	470 420	A^2s A^2s

電気的特性 / Characteristic Values

				min.	typ.	max.	
順電圧 Forward voltage	$I_F = 100\text{ A}, V_{GE} = 0\text{ V}$ $I_F = 100\text{ A}, V_{GE} = 0\text{ V}$ $I_F = 100\text{ A}, V_{GE} = 0\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	V_F		1,45 1,60 1,65	2,30	V V V
ピーク逆回復電流 Peak reverse recovery current	$I_F = 100\text{ A}, -di_F/dt = 3500\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 300\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	I_{RM}		61,6 62,8 70,8		A A A
逆回復電荷量 Recovered charge	$I_F = 100\text{ A}, -di_F/dt = 3500\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 300\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	Q_r		1,91 2,23 2,42		μC μC μC
逆回復損失 Reverse recovery energy	$I_F = 100\text{ A}, -di_F/dt = 3500\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 300\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	E_{rec}		0,25 0,42 0,46		mJ mJ mJ
ジャンクション・ヒートシンク間熱抵抗 Thermal resistance, junction to heatsink	/Diode (1 素子当り) / per diode		R_{thJH}			0,982	K/W
動作温度 Temperature under switching conditions			$T_{vj\text{ op}}$	-40		150	$^{\circ}\text{C}$

ダイオード, D2 / D3 / Diode, D2 / D3

最大定格 / Maximum Rated Values

ピーク繰返し逆電圧 Repetitive peak reverse voltage	$T_{vj} = 25^{\circ}\text{C}$	V_{RRM}	650	V
順電流 Implemented forward current		I_{FN}	150	A
連続DC電流 Continuous DC forward current		I_F	100	A
ピーク繰返し順電流 Repetitive peak forward current	$t_p = 1\text{ ms}$	I_{FRM}	300	A
電流二乗時間積 I^2t - value	$V_R = 0\text{ V}, t_p = 10\text{ ms}, T_{vj} = 125^{\circ}\text{C}$ $V_R = 0\text{ V}, t_p = 10\text{ ms}, T_{vj} = 150^{\circ}\text{C}$	I^2t	760 680	A^2s A^2s

電気的特性 / Characteristic Values

				min.	typ.	max.	
順電圧 Forward voltage	$I_F = 100\text{ A}, V_{GE} = 0\text{ V}$ $I_F = 100\text{ A}, V_{GE} = 0\text{ V}$ $I_F = 100\text{ A}, V_{GE} = 0\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	V_F		1,35 1,29 1,25	1,90	V V V
ピーク逆回復電流 Peak reverse recovery current	$I_F = 100\text{ A}, -di_F/dt = 5500\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 300\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	I_{RM}		99,0 150 161		A A A
逆回復電荷量 Recovered charge	$I_F = 100\text{ A}, -di_F/dt = 5500\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 300\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	Q_r		5,00 9,90 11,4		μC μC μC
逆回復損失 Reverse recovery energy	$I_F = 100\text{ A}, -di_F/dt = 5500\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 300\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	E_{rec}		0,75 1,68 2,02		mJ mJ mJ
ジャンクション・ヒートシンク間熱抵抗 Thermal resistance, junction to heatsink	/Diode (1 素子当り) / per diode		R_{thJH}			1,00	K/W
動作温度 Temperature under switching conditions			$T_{vj\text{ op}}$	-40		150	$^{\circ}\text{C}$

ダイオード、D5-D6 / Diode, D5-D6

最大定格 / Maximum Rated Values

ピーク繰返し逆電圧 Repetitive peak reverse voltage	$T_{vj} = 25^{\circ}\text{C}$	V_{RRM}	650	V
順電流 Implemented forward current		I_{FN}	150	A
連続DC電流 Continuous DC forward current		I_F	100	A
ピーク繰返し順電流 Repetitive peak forward current	$t_P = 1 \text{ ms}$	I_{FRM}	300	A
電流二乗時間積 I^2t - value	$V_R = 0 \text{ V}, t_P = 10 \text{ ms}, T_{vj} = 125^{\circ}\text{C}$ $V_R = 0 \text{ V}, t_P = 10 \text{ ms}, T_{vj} = 150^{\circ}\text{C}$	I^2t	760 680	A^2s A^2s

電気的特性 / Characteristic Values

				min.	typ.	max.	
順電圧 Forward voltage	$I_F = 100 \text{ A}, V_{GE} = 0 \text{ V}$ $I_F = 100 \text{ A}, V_{GE} = 0 \text{ V}$ $I_F = 100 \text{ A}, V_{GE} = 0 \text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	V_F		1,35 1,29 1,25	1,90	V V V
ピーク逆回復電流 Peak reverse recovery current	$I_F = 100 \text{ A}, -di_F/dt = 5500 \text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 300 \text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	I_{RM}		99,0 149 161		A A A
逆回復電荷量 Recovered charge	$I_F = 100 \text{ A}, -di_F/dt = 5500 \text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 300 \text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	Q_r		5,00 9,90 11,4		μC μC μC
逆回復損失 Reverse recovery energy	$I_F = 100 \text{ A}, -di_F/dt = 5500 \text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 300 \text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	E_{rec}		0,75 1,68 2,02		mJ mJ mJ
ジャンクション・ヒートシンク間熱抵抗 Thermal resistance, junction to heatsink	/Diode (1 素子当り) / per diode		R_{thJH}			1,00	K/W
動作温度 Temperature under switching conditions			$T_{vj op}$	-40		150	$^{\circ}\text{C}$

NTC-サーミスタ / NTC-Thermistor

電気的特性 / Characteristic Values

				min.	typ.	max.	
定格抵抗値 Rated resistance	$T_{NTC} = 25^{\circ}\text{C}$		R_{25}		5,00		k Ω
R100の偏差 Deviation of R100	$T_{NTC} = 100^{\circ}\text{C}, R_{100} = 493 \Omega$		$\Delta R/R$	-5		5	%
損失 Power dissipation	$T_{NTC} = 25^{\circ}\text{C}$		P_{25}			20,0	mW
B-定数 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 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 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

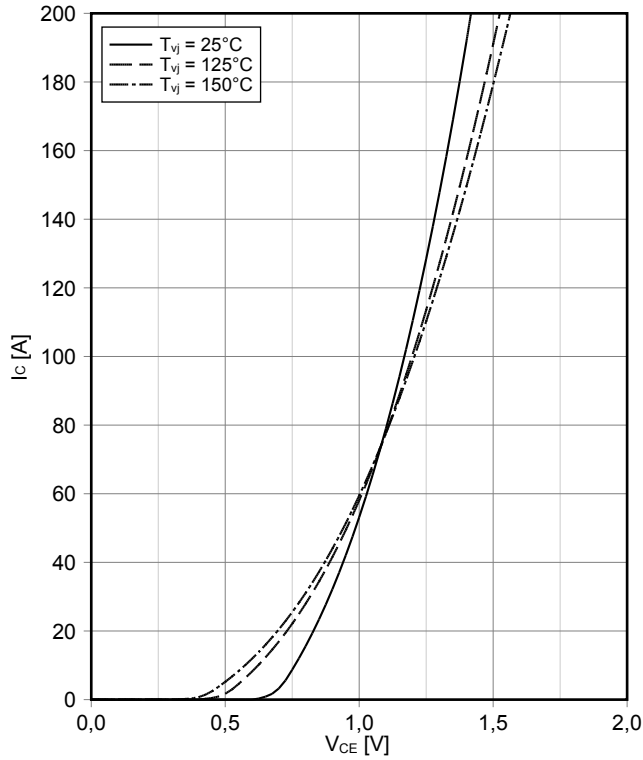
Specification according to the valid application note.

モジュール / Module

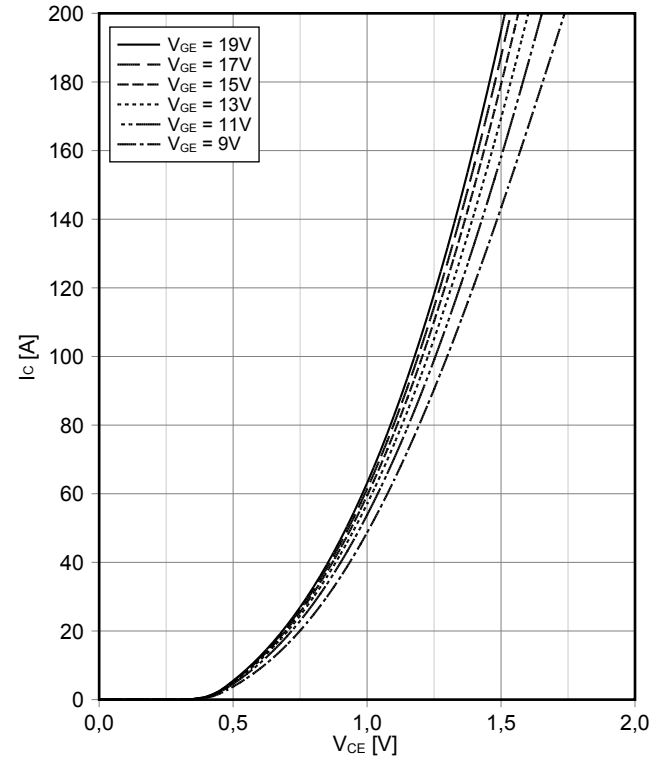
絶縁耐圧 Isolation test voltage	RMS, f = 50 Hz, t = 1 min.	V _{ISOL}	2,5		kV
内部絶縁 Internal isolation	基礎絶縁 (クラス1, IEC 61140) basic insulation (class 1, IEC 61140)		Al ₂ O ₃		
沿面距離 Creepage distance	連絡方法 - ヒートシンク / terminal to heatsink 連絡方法 - 連絡方法 / terminal to terminal		11,5 6,3		mm
空間距離 Clearance	連絡方法 - ヒートシンク / terminal to heatsink 連絡方法 - 連絡方法 / terminal to terminal		10,0 5,0		mm
相対トラッキング指数 Comperative tracking index		CTI	> 200		
相対温度指数 (電気) RTI Elec.	住宅 housing	RTI	140		°C
			min.	typ.	max.
内部インダクタンス Stray inductance module		L _{sCE}		20	nH
保存温度 Storage temperature		T _{stg}	-40		125 °C
最大ベース・プレート動作温度 Maximum baseplate operation temperature		T _{BPmax}			125 °C
Anpresskraft für mech. Bef. pro Feder mounting force per clamp		F	40	-	80 N
質量 Weight		G		39	g

Der Strom im Dauerbetrieb ist auf 25A effektiv pro Anschlusspin begrenzt.
 The current under continuous operation is limited to 25A rms per connector pin.
 Lagerung und Transport von Modulen mit TIM => siehe AN2012-07
 Storage and Shipment of modules with TIM => see AN2012-07

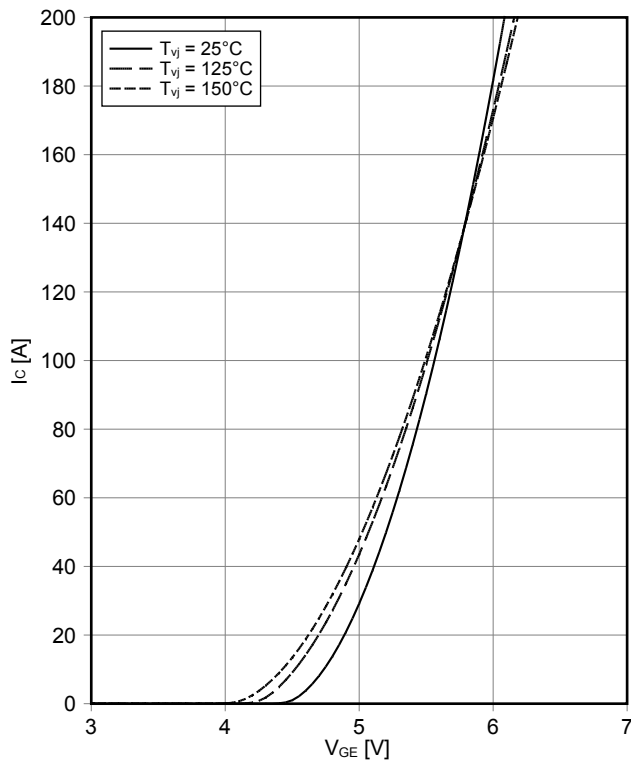
出力特性 IGBT, T1 / T4 (Typical)
output characteristic IGBT, T1 / T4 (typical)
 $I_C = f(V_{CE})$
 $V_{GE} = 15\text{ V}$



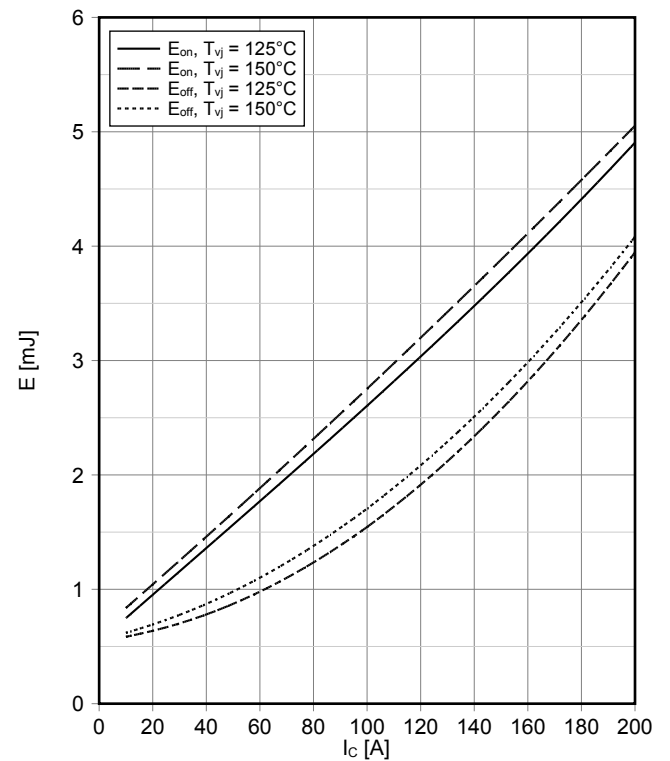
出力特性 IGBT, T1 / T4 (Typical)
output characteristic IGBT, T1 / T4 (typical)
 $I_C = f(V_{CE})$
 $T_{vj} = 150^\circ\text{C}$



伝達特性 IGBT, T1 / T4 (Typical)
transfer characteristic IGBT, T1 / T4 (typical)
 $I_C = f(V_{GE})$
 $V_{CE} = 20\text{ V}$

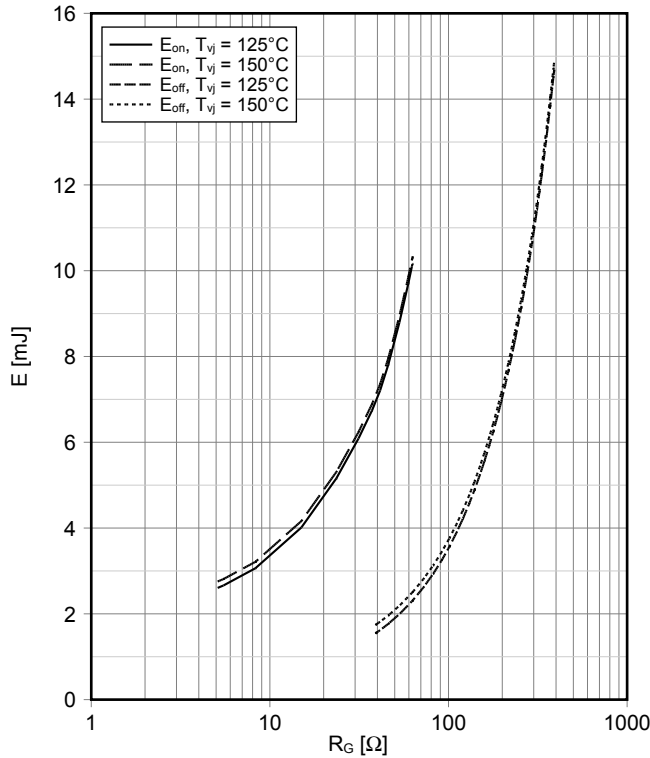


スイッチング損失 IGBT, T1 / T4 (Typical)
switching losses IGBT, T1 / T4 (typical)
 $E_{on} = f(I_C)$, $E_{off} = f(I_C)$
 $V_{GE} = \pm 15\text{ V}$, $R_{Gon} = 5,1\ \Omega$, $R_{Goff} = 39\ \Omega$, $V_{CE} = 300\text{ V}$



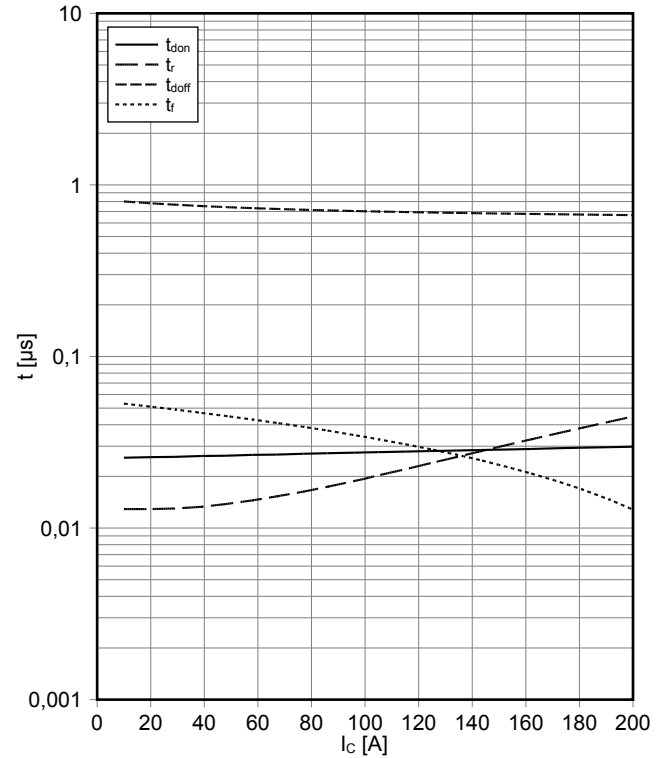
スイッチング損失 IGBT, T1 / T4 (Typical)
switching losses IGBT, T1 / T4 (typical)

$E_{on} = f(R_G), E_{off} = f(R_G)$
 $V_{GE} = \pm 15\text{ V}, I_C = 100\text{ A}, V_{CE} = 300\text{ V}$



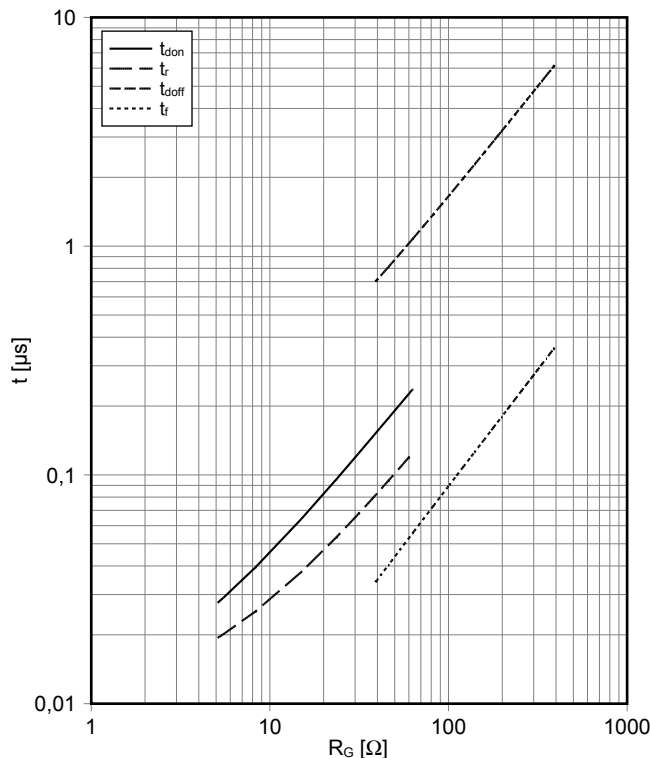
??? IGBT, T1 / T4 (Typical)
switching times IGBT, T1 / T4 (typical)

$t_{don} = f(I_C), t_r = f(I_C), t_{doff} = f(I_C), t_f = f(I_C)$
 $V_{GE} = \pm 15\text{ V}, R_{Gon} = 5.1\ \Omega, R_{Goff} = 39\ \Omega, V_{CE} = 300\text{ V}, T_{vj} = 150\ \text{°C}$



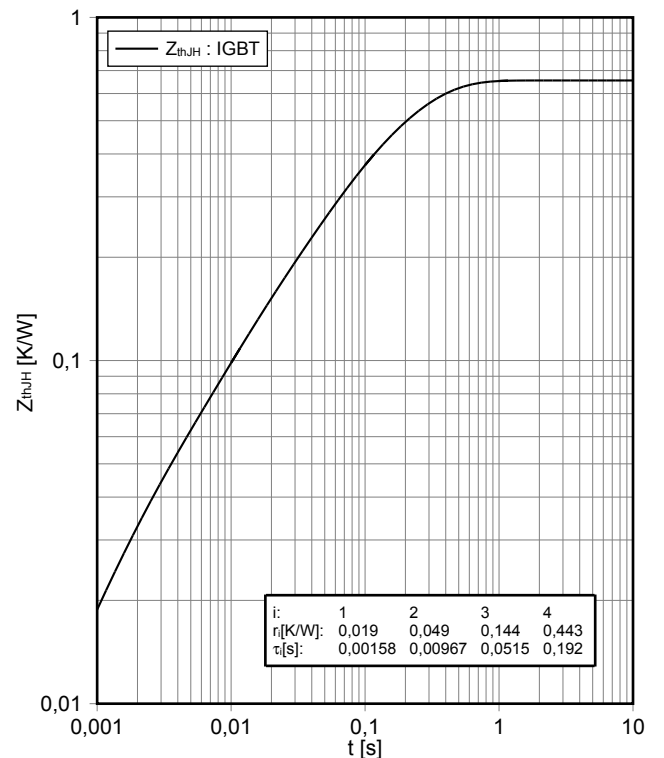
??? IGBT, T1 / T4 (Typical)
switching times IGBT, T1 / T4 (typical)

$t_{don} = f(R_G), t_r = f(R_G), t_{doff} = f(R_G), t_f = f(R_G)$
 $V_{GE} = \pm 15\text{ V}, R_{Gon} = 5.1\ \Omega, R_{Goff} = 39\ \Omega, V_{CE} = 300\text{ V}, T_{vj} = 150\ \text{°C}$



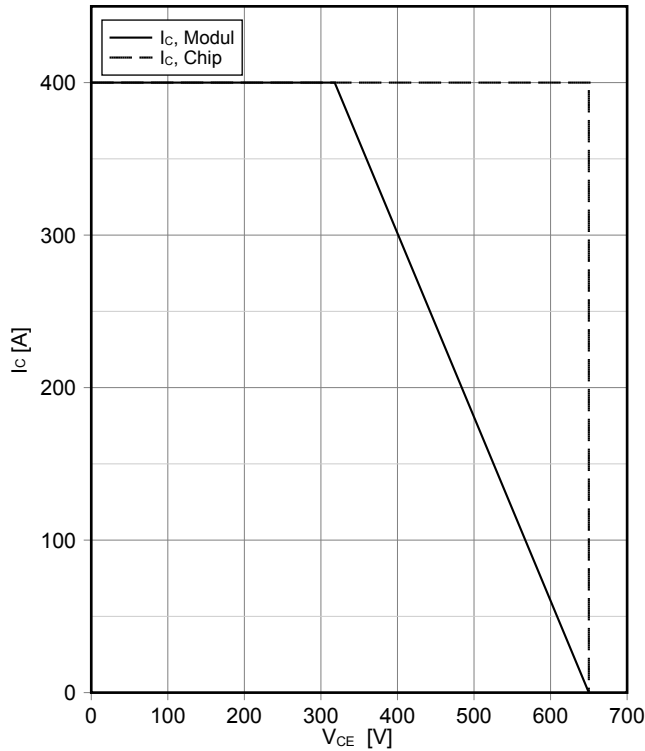
過渡熱インピーダンス IGBT, T1 / T4
transient thermal impedance IGBT, T1 / T4

$Z_{thJH} = f(t)$



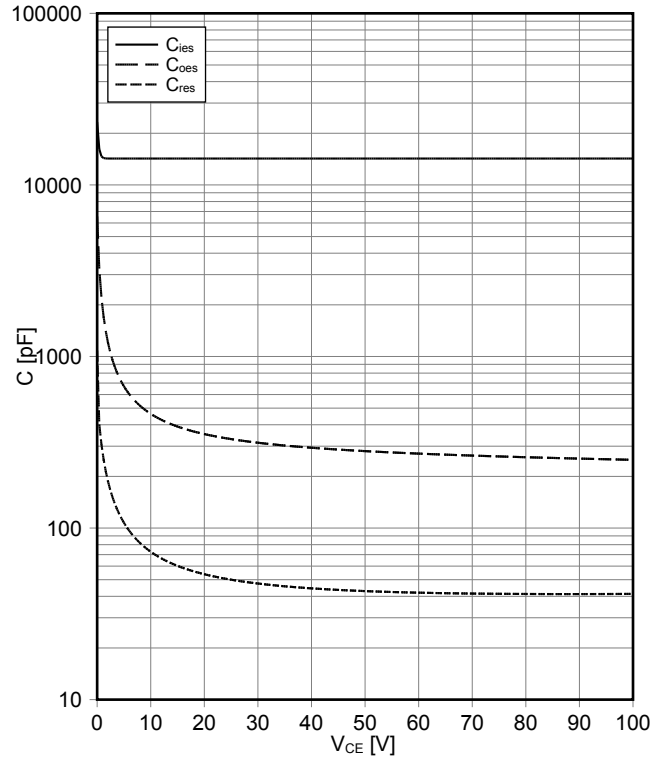
逆バイアス安全動作領域 IGBT, T1 / T4 (RBSOA)
reverse bias safe operating area IGBT, T1 / T4 (RBSOA)

$I_C = f(V_{CE})$
 $V_{GE} = \pm 15\text{ V}$, $R_{Goff} = 39\ \Omega$, $T_{vj} = 150^\circ\text{C}$



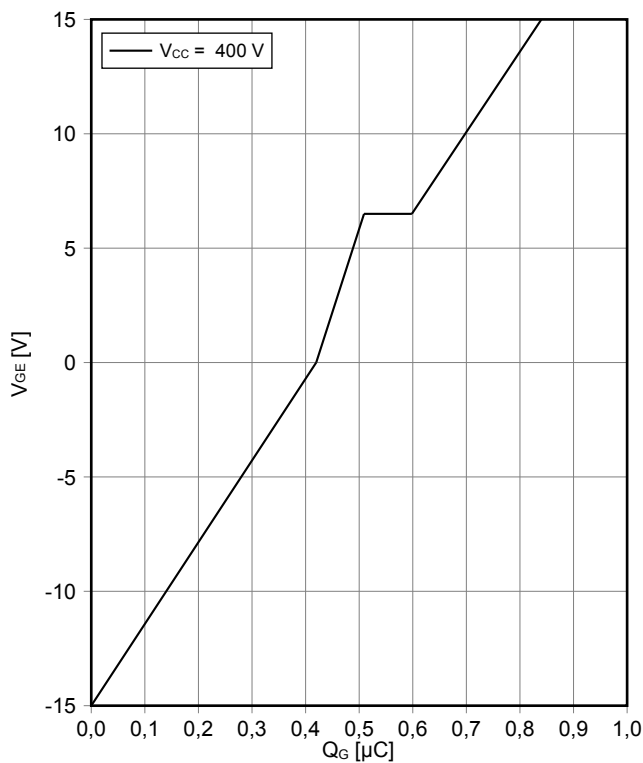
容量特性 IGBT, T1 / T4 (Typical)
capacity characteristic IGBT, T1 / T4 (typical)

$C = f(V_{CE})$
 $V_{GE} = 0\text{ V}$, $T_{vj} = 25^\circ\text{C}$, $f = 100\text{kHz}$



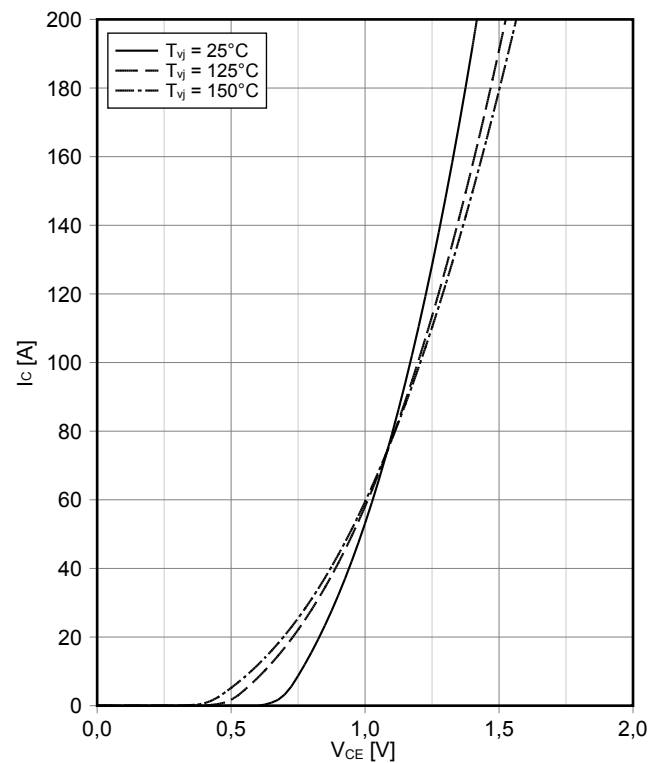
ゲート充電特性 IGBT, T1 / T4 (典型)
gate charge characteristic IGBT, T1 / T4 (typical)

$V_{GE} = f(Q_G)$
 $I_C = 100\text{ A}$, $T_{vj} = 25^\circ\text{C}$



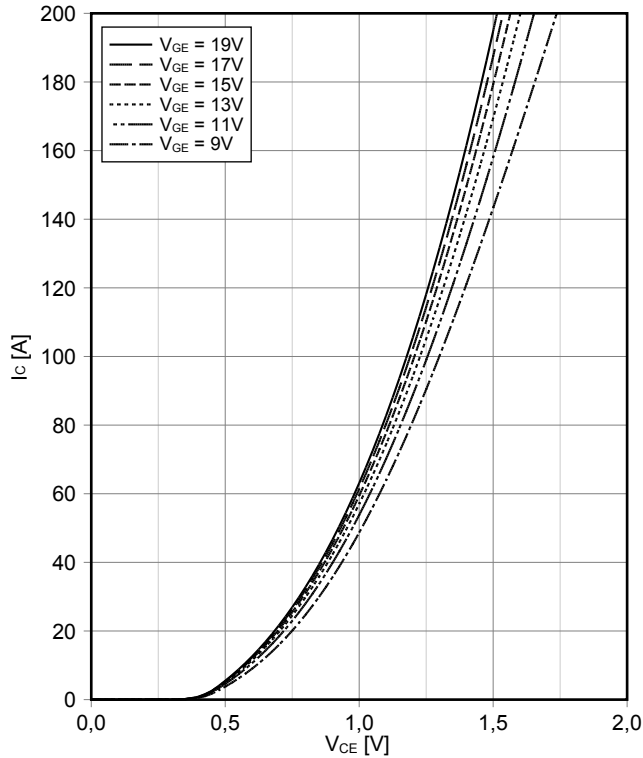
出力特性 IGBT, T2 / T3 (Typical)
output characteristic IGBT, T2 / T3 (typical)

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



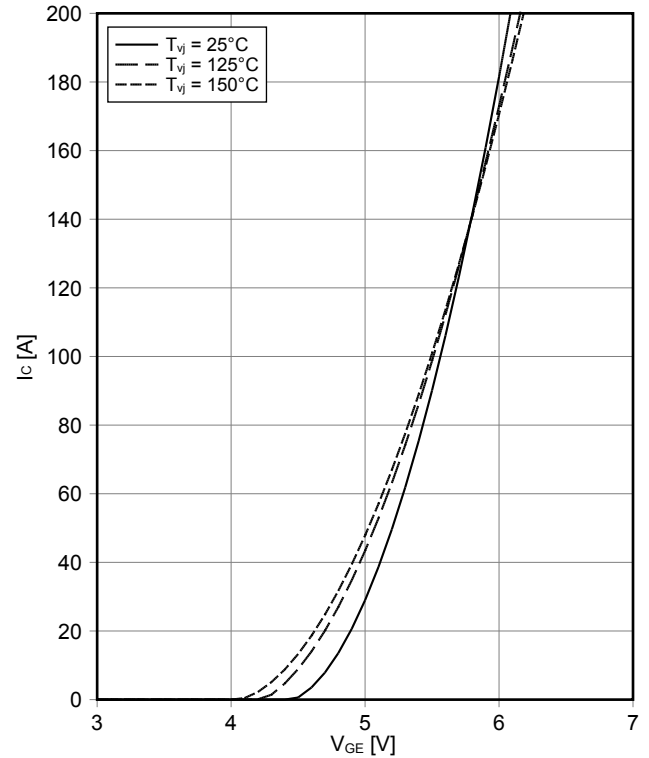
出力特性 IGBT, T2 / T3 (Typical)
output characteristic IGBT, T2 / T3 (typical)

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



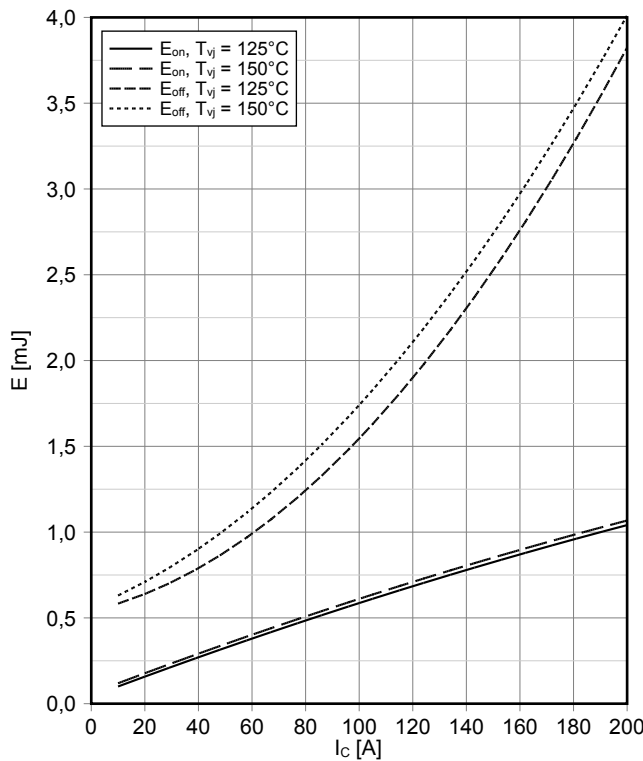
伝達特性 IGBT, T2 / T3 (Typical)
transfer characteristic IGBT, T2 / T3 (typical)

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



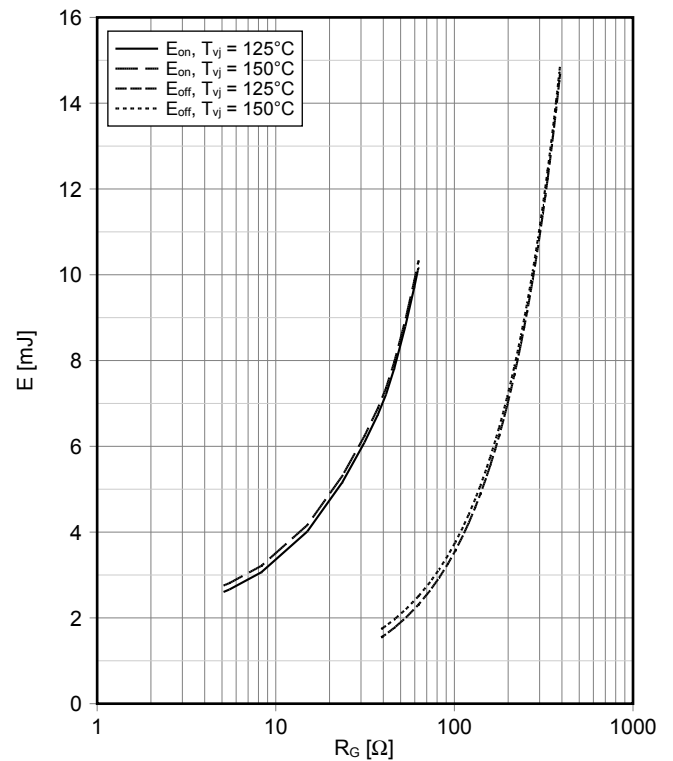
スイッチング損失 IGBT, T2 / T3 (Typical)
switching losses IGBT, T2 / T3 (typical)

$E_{on} = f(I_C), E_{off} = f(I_C)$
 $V_{GE} = \pm 15\text{ V}, R_{Gon} = 5.1\ \Omega, R_{Goff} = 39\ \Omega, V_{CE} = 300\text{ V}$



スイッチング損失 IGBT, T2 / T3 (Typical)
switching losses IGBT, T2 / T3 (typical)

$E_{on} = f(R_G), E_{off} = f(R_G)$
 $V_{GE} = \pm 15\text{ V}, I_C = 100\text{ A}, V_{CE} = 300\text{ V}$

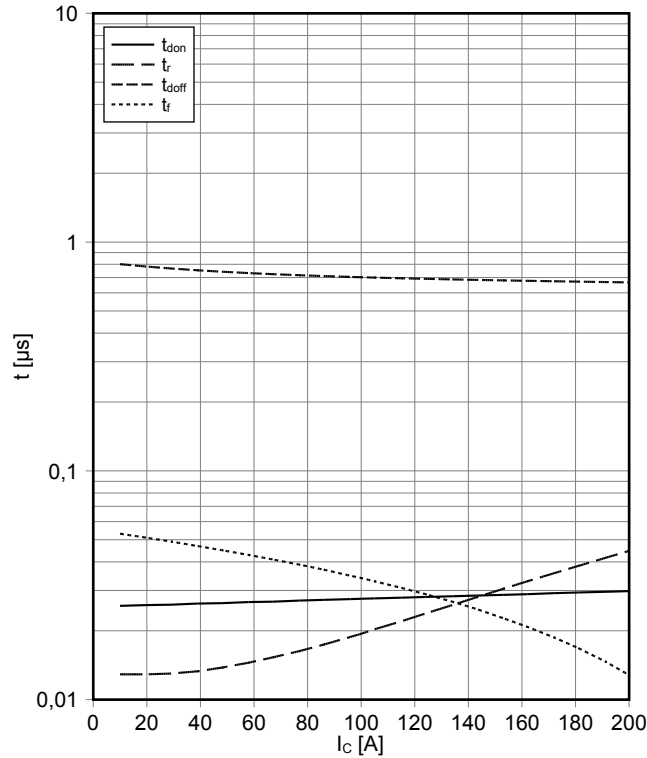


??? IGBT, T2 / T3 (Typical)

switching times IGBT, T2 / T3 (typical)

$t_{don} = f(I_C)$, $t_r = f(I_C)$, $t_{doff} = f(I_C)$, $t_f = f(I_C)$

$V_{GE} = \pm 15\text{ V}$, $R_{Gon} = 5.1\ \Omega$, $R_{Goff} = 39\ \Omega$, $V_{CE} = 300\text{ V}$, $T_{vj} = 150\text{ }^\circ\text{C}$

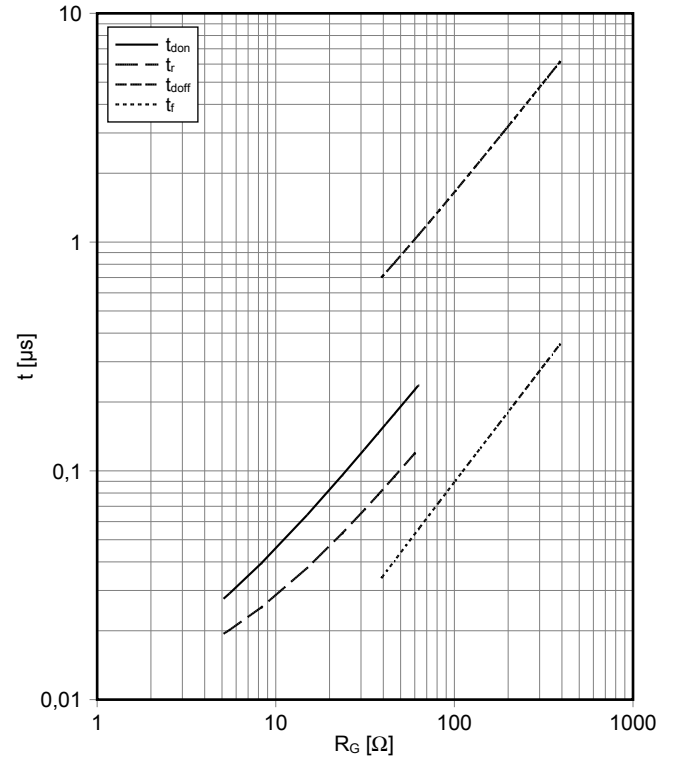


??? IGBT, T2 / T3 (Typical)

switching times IGBT, T2 / T3 (typical)

$t_{don} = f(R_G)$, $t_r = f(R_G)$, $t_{doff} = f(R_G)$, $t_f = f(R_G)$

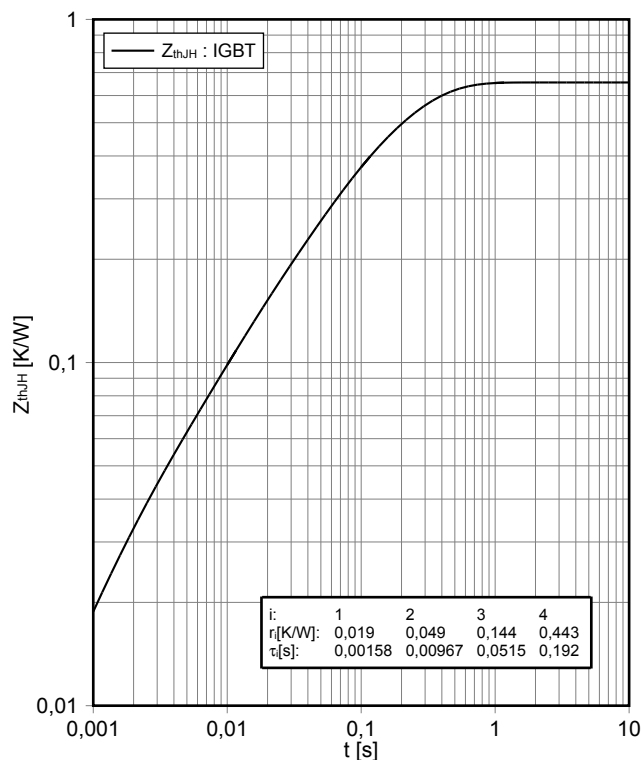
$V_{GE} = \pm 15\text{ V}$, $I_C = 100\text{ A}$, $V_{CE} = 300\text{ V}$, $T_{vj} = 150\text{ }^\circ\text{C}$



過渡熱インピーダンス IGBT, T2 / T3

transient thermal impedance IGBT, T2 / T3

$Z_{thJH} = f(t)$

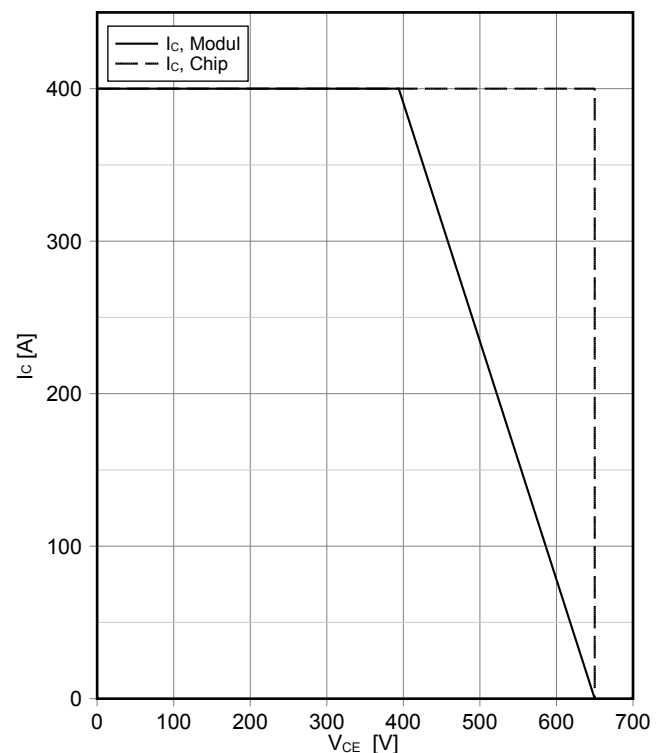


逆バイアス安全動作領域 IGBT, T2 / T3 (RBSOA)

reverse bias safe operating area IGBT, T2 / T3 (RBSOA)

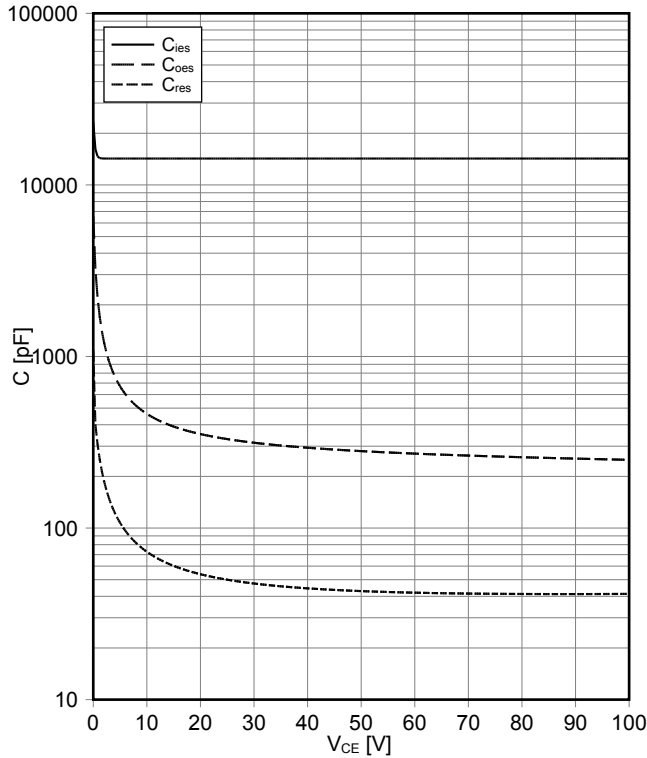
$I_C = f(V_{CE})$

$V_{GE} = \pm 15\text{ V}$, $R_{Goff} = 39\ \Omega$, $T_{vj} = 150\text{ }^\circ\text{C}$



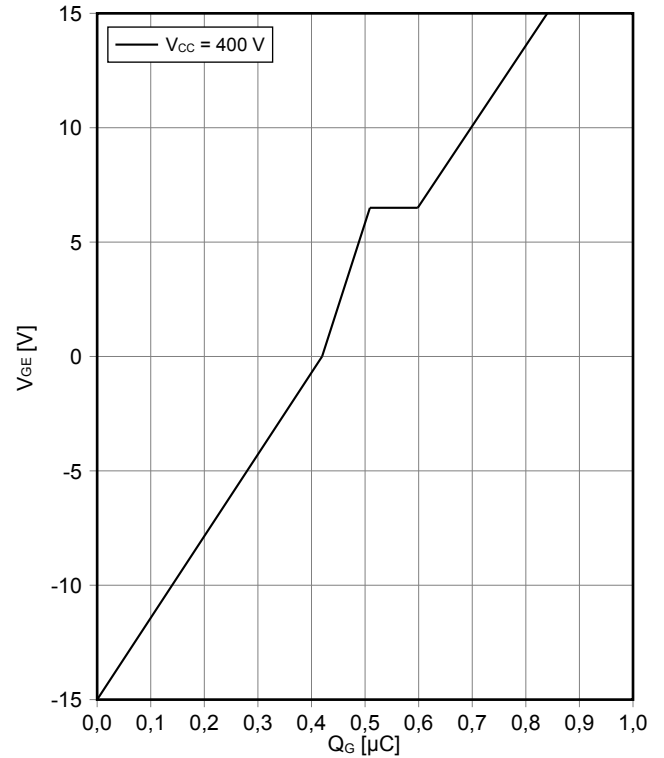
容量特性 IGBT, T2 / T3 (Typical)
capacity characteristic IGBT, T2 / T3 (typical)

$C = f(V_{CE})$
 $V_{GE} = 0 \text{ V}, T_{vj} = 25^\circ\text{C}, f = 100\text{kHz}$



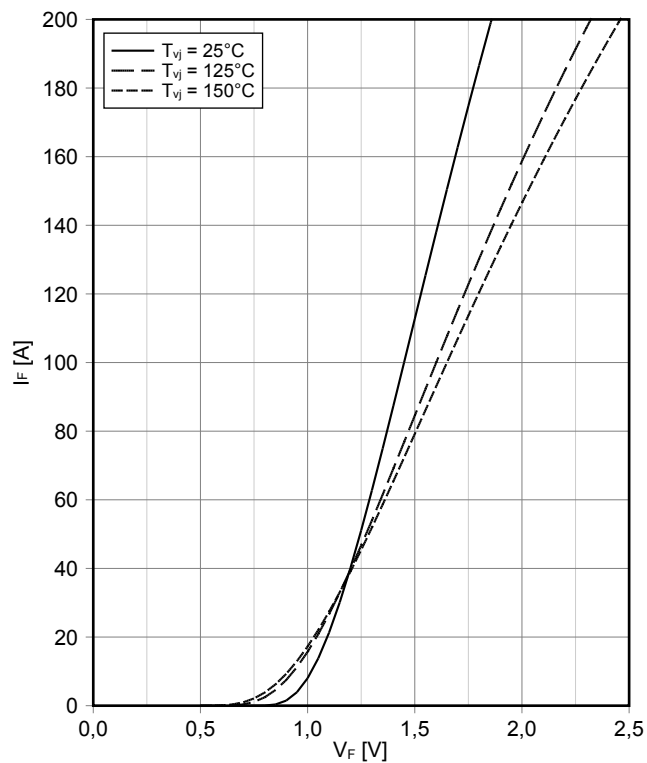
ゲート充電特性 IGBT, T2 / T3 (典型)
gate charge characteristic IGBT, T2 / T3 (typical)

$V_{GE} = f(Q_G)$
 $I_C = 100 \text{ A}, T_{vj} = 25^\circ\text{C}$



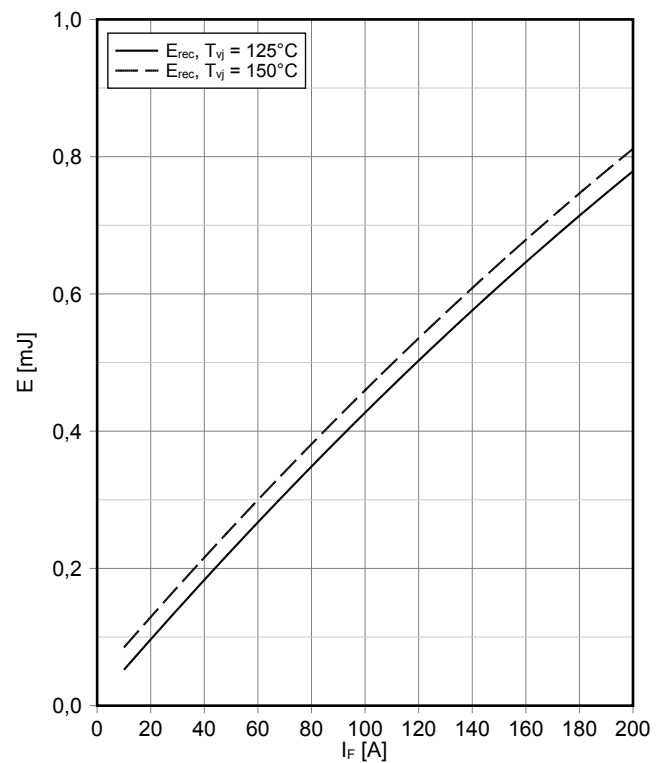
順電圧特性 ダイオード, D1 / D4 (typical)
forward characteristic of Diode, D1 / D4 (typical)

$I_F = f(V_F)$



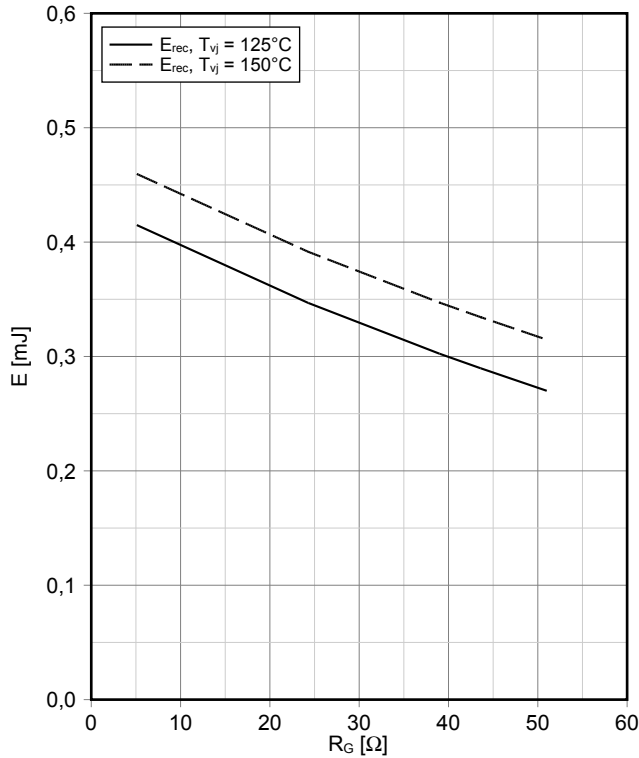
スイッチング損失 ダイオード, D1 / D4 (Typical)
switching losses Diode, D1 / D4 (typical)

$E_{rec} = f(I_F)$
 $R_{Gon} = 5.1 \Omega, V_{CE} = 300 \text{ V}$



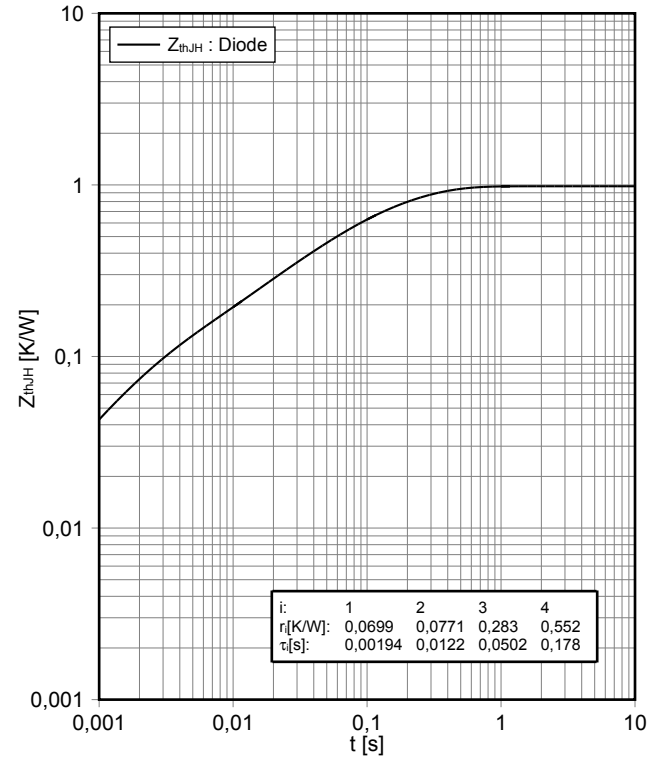
スイッチング損失 ダイオード, D1 / D4 (Typical)
switching losses Diode, D1 / D4 (typical)

$E_{rec} = f(R_G)$
 $I_F = 100\text{ A}, V_{CE} = 300\text{ V}$



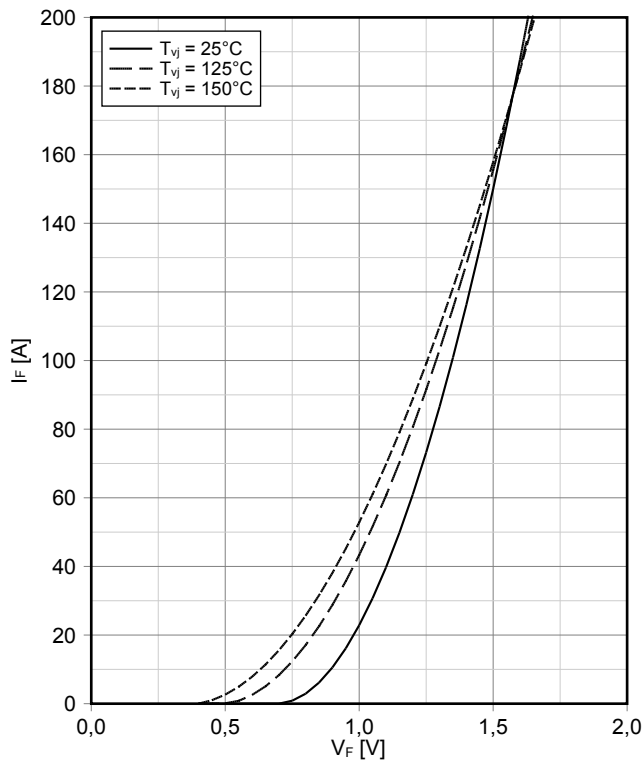
過渡熱インピーダンス ダイオード, D1 / D4
transient thermal impedance Diode, D1 / D4

$Z_{thJH} = f(t)$



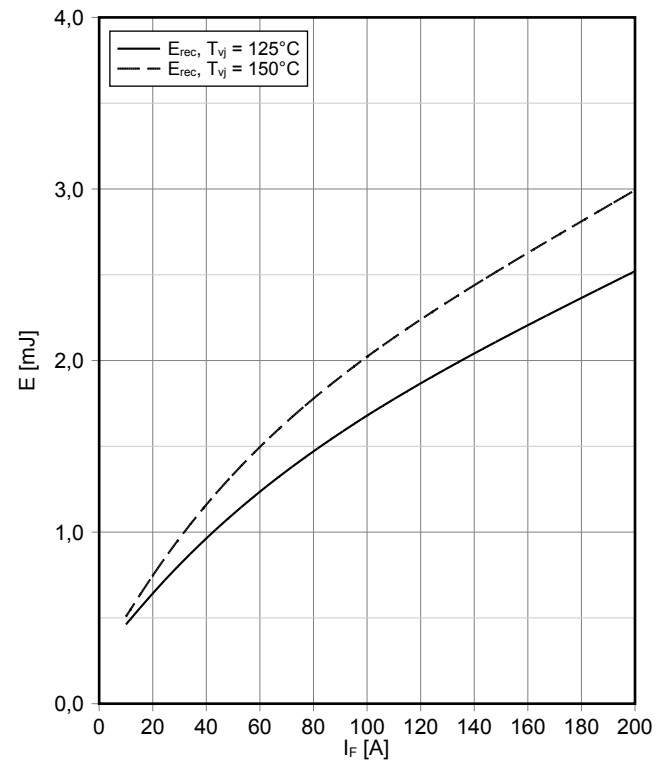
順電圧特性 ダイオード, D2 / D3 (typical)
forward characteristic of Diode, D2 / D3 (typical)

$I_F = f(V_F)$



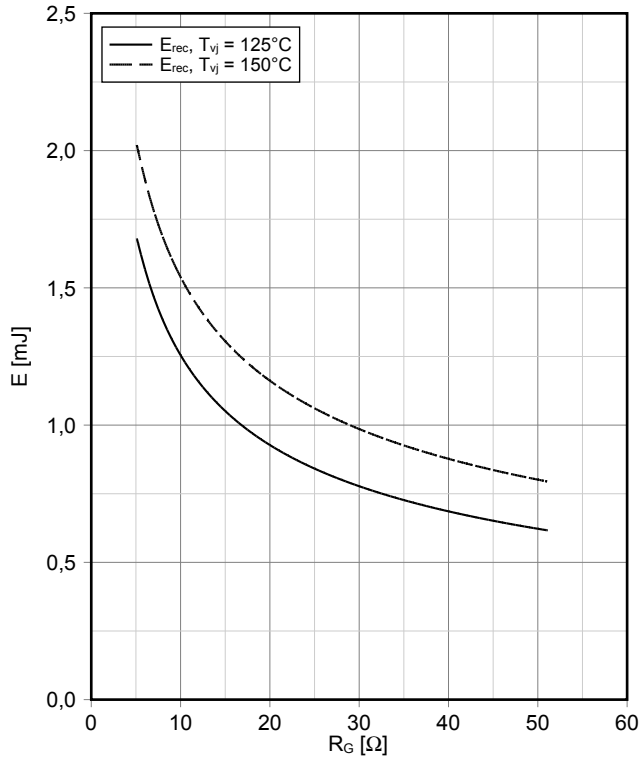
スイッチング損失 ダイオード, D2 / D3 (Typical)
switching losses Diode, D2 / D3 (typical)

$E_{rec} = f(I_F)$
 $R_{Gon} = 5,1\ \Omega, V_{CE} = 300\text{ V}$



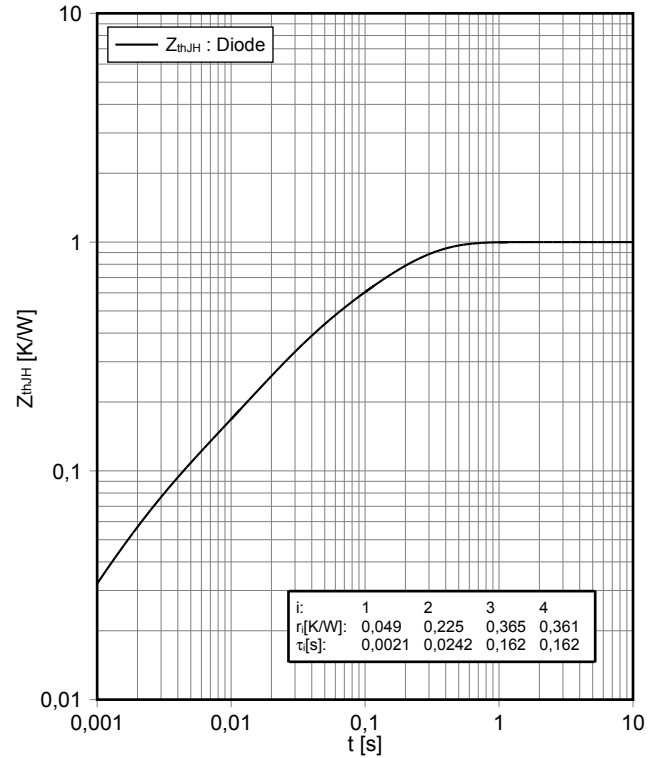
スイッチング損失 ダイオード, D2 / D3 (Typical)
switching losses Diode, D2 / D3 (typical)

$E_{rec} = f(R_G)$
 $I_F = 100\text{ A}, V_{CE} = 300\text{ V}$



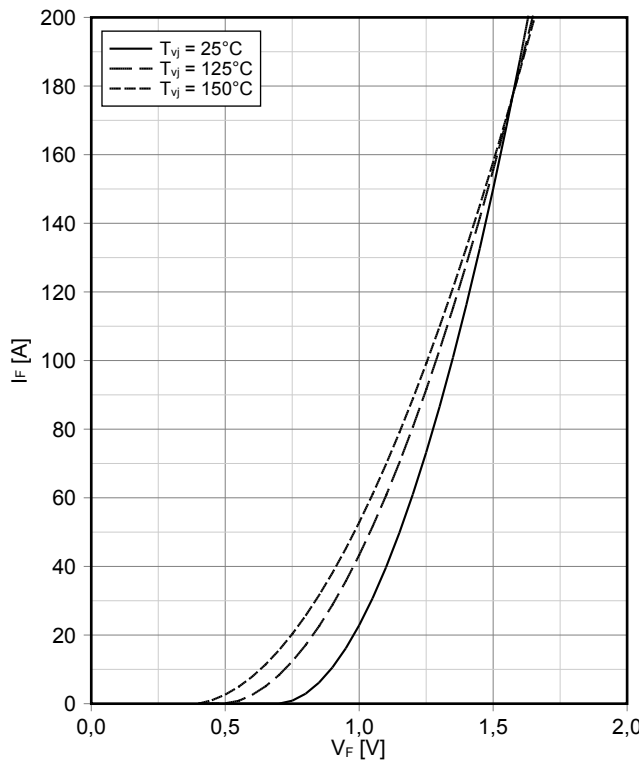
過渡熱インピーダンス ダイオード, D2 / D3
transient thermal impedance Diode, D2 / D3

$Z_{thJH} = f(t)$



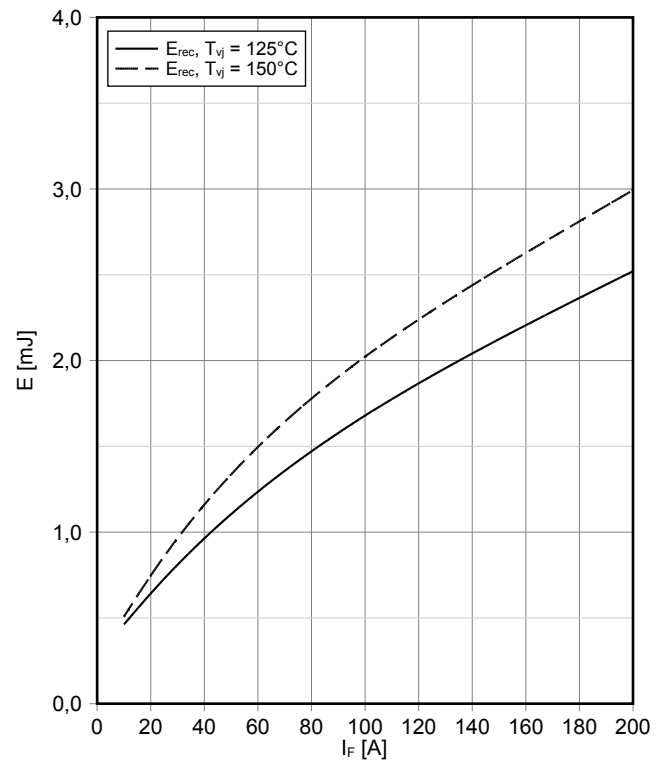
順電圧特性 ダイオード, D5-D6 (typical)
forward characteristic of Diode, D5-D6 (typical)

$I_F = f(V_F)$



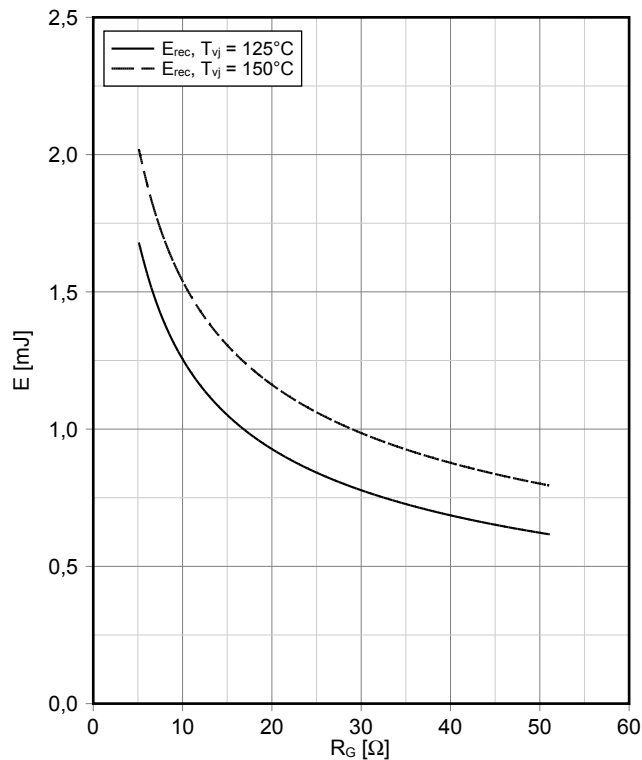
スイッチング損失 ダイオード, D5-D6 (Typical)
switching losses Diode, D5-D6 (typical)

$E_{rec} = f(I_F)$
 $R_{Gon} = 5,1\ \Omega, V_{CE} = 300\text{ V}$



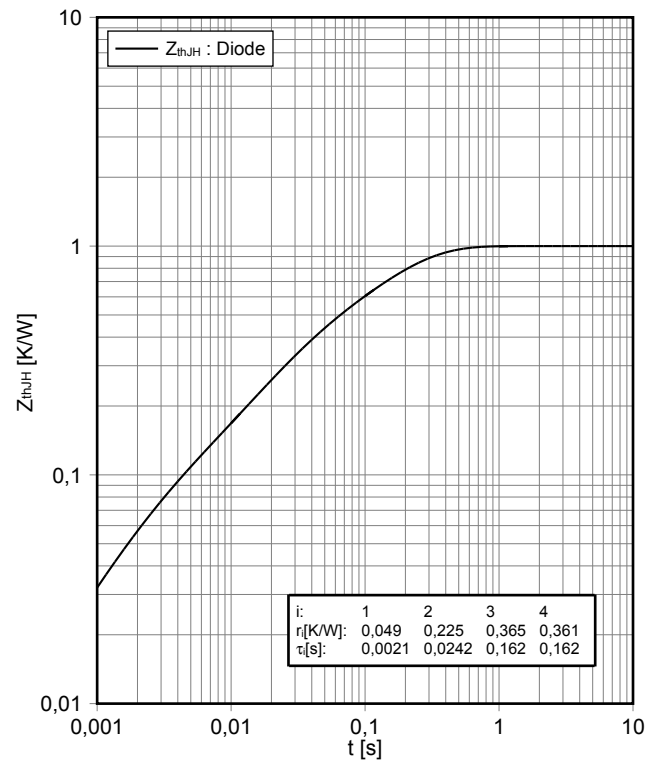
スイッチング損失 ダイオード、D5-D6 (Typical)
switching losses Diode, D5-D6 (typical)

$E_{rec} = f(R_G)$
 $I_F = 100\text{ A}, V_{CE} = 300\text{ V}$



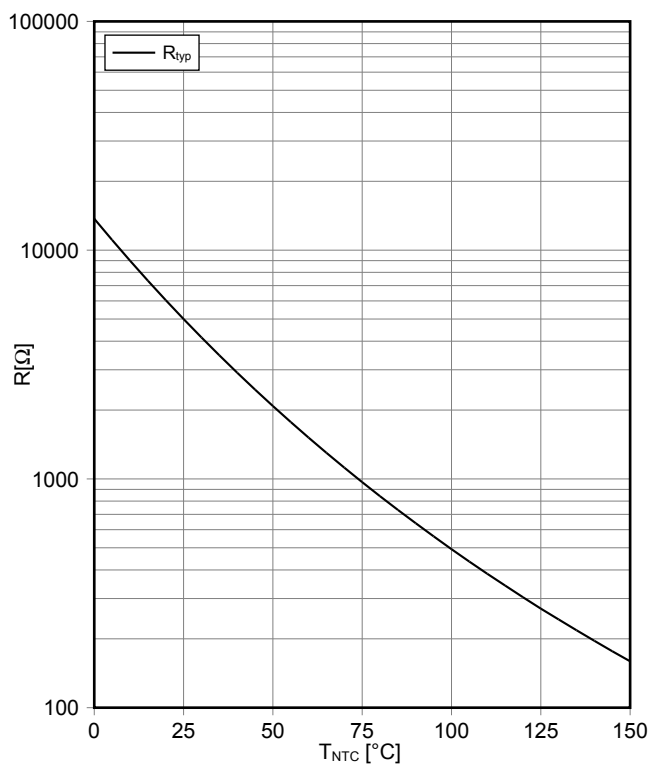
過渡熱インピーダンス ダイオード、D5-D6
transient thermal impedance Diode, D5-D6

$Z_{thJH} = f(t)$

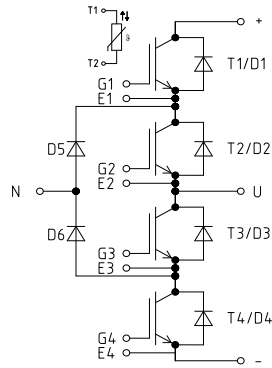


NTC-サーミスタ サーミスタの温度特性
NTC-Thermistor-temperature characteristic (typical)

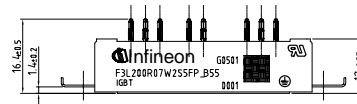
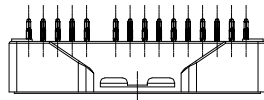
$R = f(T_{NTC})$



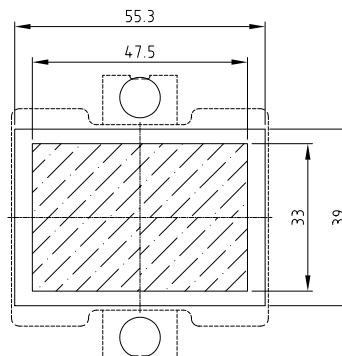
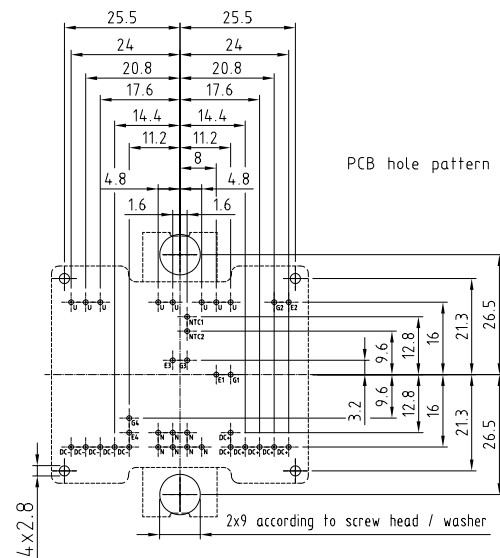
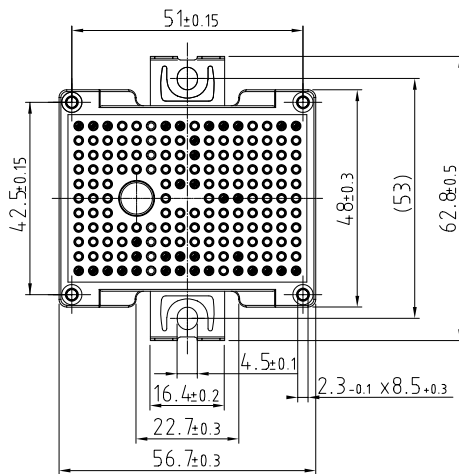
回路図 / Circuit diagram



パッケージ概要 / Package outlines



- Pin-Grid 3.2mm
- Tolerance of PCB hole pattern $\varnothing 0.1$
- Hole specification for contacts see AN 2009-01:
Diameters of drill $\varnothing 1.15\text{mm}$
and copper thickness in hole 25-50 μm



restricted area for Thermal Interface Material

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