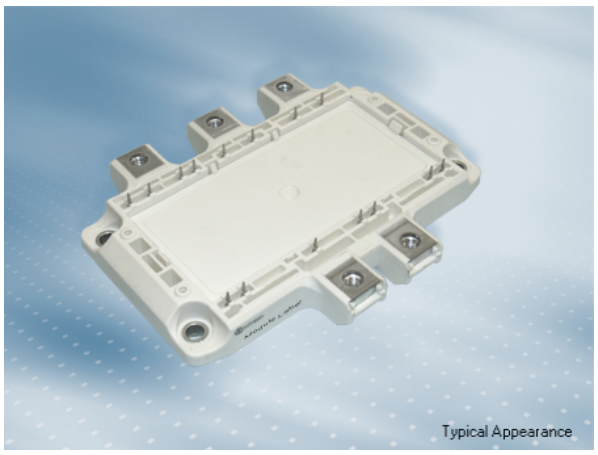
Technische Information / Technical Information

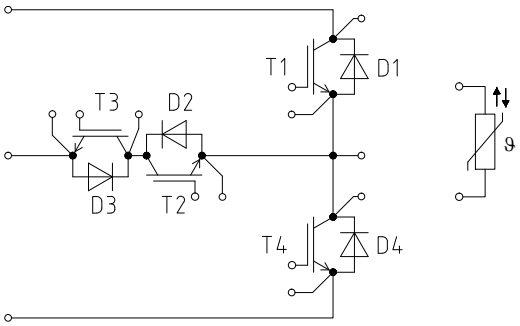
IGBT-Module
IGBT-modules

F3L300R12PT4_B26

EconoPACK™4 Modul mit aktiver "Neutral Point Clamp 2" Topologie und PressFIT / NTC
EconoPACK™4 module with active "Neutral Point Clamp 2" topology and PressFIT / NTC

Vorläufige Daten / Preliminary Data





V_{CES} = 1200V
$I_{C\ nom}$ = 300A / I_{CRM} = 600A

Typische Anwendungen
- Solar Anwendungen
- USV-Systeme

Typical Applications
- Solar Applications
- UPS Systems

Elektrische Eigenschaften
- Erweiterte Sperrschichttemperatur $T_{vj\ op}$
- Niedrige Schaltverluste
- Niedriges V_{CEsat}
- Trench IGBT 4
- $T_{vj\ op}$ = 150°C
- V_{CEsat} mit positivem Temperaturkoeffizienten

Electrical Features
- Extended Operation Temperature $T_{vj\ op}$
- Low Switching Losses
- Low V_{CEsat}
- Trench IGBT 4
- $T_{vj\ op}$ = 150°C
- V_{CEsat} with positive Temperature Coefficient

Mechanische Eigenschaften
- Isolierte Bodenplatte
- Kompaktes Design
- PressFIT Verbindungstechnik
- Standardgehäuse

Mechanical Features
- Isolated Base Plate
- Compact design
- PressFIT Contact Technology
- Standard Housing

Module Label Code

Barcode Code 128

DMX - 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: MK	date of publication: 2013-03-08	
approved by: MK	revision: 2.0	UL approved (E83335)

Vorläufige Daten
Preliminary Data

IGBT, T1 / T4 / IGBT, T1 / T4

Höchstzulässige Werte / Maximum Rated Values

Kollektor-Emitter-Sperrspannung Collector-emitter voltage	T_{vj} = 25°C	V_{CES}	1200		V
Kollektor-Dauergleichstrom Continuous DC collector current	T_C = 100°C, T_{vj} = 175°C T_C = 25°C, T_{vj} = 175°C	$I_{C\,nom}$ I_C	300 460		A A
Periodischer Kollektor-Spitzenstrom Repetitive peak collector current	t_P = 1 ms	I_{CRM}	600		A
Gesamt-Verlustleistung Total power dissipation	T_C = 25°C, T_{vj} = 175°C	P_{tot}	1650		W
Gate-Emitter-Spitzenspannung Gate-emitter peak voltage		V_{GES}	+/-20		V

Charakteristische Werte / Characteristic Values

			min.	typ.	max.	
Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage	I_C = 300 A, V_{GE} = 15 V T_{vj} = 25°C I_C = 300 A, V_{GE} = 15 V T_{vj} = 125°C I_C = 300 A, V_{GE} = 15 V T_{vj} = 150°C	$V_{CE\,sat}$		1,75 2,05 2,10	2,15	V V V
Gate-Schwellenspannung Gate threshold voltage	I_C = 12,0 mA, V_{CE} = V_{GE}, T_{vj} = 25°C	V_{GEth}	5,2	5,8	6,4	V
Gateladung Gate charge	V_{GE} = -15 V ... +15 V	Q_G		2,50		µC
Interner Gatewiderstand Internal gate resistor	T_{vj} = 25°C	R_{Gint}		2,5		Ω
Eingangskapazität Input capacitance	f = 1 MHz, T_{vj} = 25°C, V_{CE} = 25 V, V_{GE} = 0 V	C_{ies}		18,5		nF
Rückwirkungskapazität Reverse transfer capacitance	f = 1 MHz, T_{vj} = 25°C, V_{CE} = 25 V, V_{GE} = 0 V	C_{res}		1,00		nF
Kollektor-Emitter-Reststrom Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C	I_{CES}			1,0	mA
Gate-Emitter-Reststrom Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C	I_{GES}			100	nA
Einschaltverzögerungszeit, induktive Last Turn-on delay time, inductive load	I_C = 300 A, V_{CE} = 300 V T_{vj} = 25°C V_{GE} = ±15 V T_{vj} = 125°C R_{Gon} = 1,5 Ω T_{vj} = 150°C	$t_{d\,on}$		0,21 0,23 0,24		µs µs µs
Anstiegszeit, induktive Last Rise time, inductive load	I_C = 300 A, V_{CE} = 300 V T_{vj} = 25°C V_{GE} = ±15 V T_{vj} = 125°C R_{Gon} = 1,5 Ω T_{vj} = 150°C	t_r		0,09 0,10 0,11		µs µs µs
Abschaltverzögerungszeit, induktive Last Turn-off delay time, inductive load	I_C = 300 A, V_{CE} = 300 V T_{vj} = 25°C V_{GE} = ±15 V T_{vj} = 125°C R_{Goff} = 1,5 Ω T_{vj} = 150°C	$t_{d\,off}$		0,38 0,46 0,48		µs µs µs
Fallzeit, induktive Last Fall time, inductive load	I_C = 300 A, V_{CE} = 300 V T_{vj} = 25°C V_{GE} = ±15 V T_{vj} = 125°C R_{Goff} = 1,5 Ω T_{vj} = 150°C	t_f		0,07 0,10 0,11		µs µs µs
Einschaltverlustenergie pro Puls Turn-on energy loss per pulse	I_C = 300 A, V_{CE} = 300 V, L_S = 35 nH T_{vj} = 25°C V_{GE} = ±15 V, di/dt = 2300 A/µs (T_{vj}=150°C) T_{vj} = 125°C R_{Gon} = 1,5 Ω T_{vj} = 150°C	E_{on}		7,80 11,5 12,5		mJ mJ mJ
Abschaltverlustenergie pro Puls Turn-off energy loss per pulse	I_C = 300 A, V_{CE} = 300 V, L_S = 35 nH T_{vj} = 25°C V_{GE} = ±15 V, du/dt = 2300 V/µs (T_{vj}=150°C) T_{vj} = 125°C R_{Goff} = 1,5 Ω T_{vj} = 150°C	E_{off}		13,0 19,0 20,5		mJ mJ mJ
Kurzschlußverhalten SC data	V_{GE} ≤ 15 V, V_{CC} = 800 V t_P ≤ 10 µs, T_{vj} = 25°C V_{CEmax} = V_{CES} -L_{sCE} ·di/dt t_P ≤ 10 µs, T_{vj} = 150°C	I_{SC}		1700 1400		A A
Wärmewiderstand, Chip bis Gehäuse Thermal resistance, junction to case	pro IGBT / per IGBT	R_{thJC}			0,09	K/W
Wärmewiderstand, Gehäuse bis Kühlkörper Thermal resistance, case to heatsink	pro IGBT / per IGBT λ_{Paste} = 1 W/(m·K) / λ_{grease} = 1 W/(m·K)	R_{thCH}		0,049		K/W

prepared by: MK	date of publication: 2013-03-08
approved by: MK	revision: 2.0

Vorläufige Daten
Preliminary Data

Diode, D2 / D3 / Diode, D2 / D3

Höchstzulässige Werte / Maximum Rated Values

Periodische Spitzensperrspannung Repetitive peak reverse voltage	T_{vj} = 25°C		V_{RRM}	650	V
Dauergleichstrom Continuous DC forward current			I_F	300	A
Periodischer Spitzenstrom Repetitive peak forward current	t_P = 1 ms		I_{FRM}	600	A
Grenzlastintegral I²t - value	V_R = 0 V, t_P = 10 ms, T_{vj} = 125°C V_R = 0 V, t_P = 10 ms, T_{vj} = 150°C		I²t	6700 6150	A²s A²s

Charakteristische Werte / Characteristic Values

				min.	typ.	max.	
Durchlassspannung Forward voltage	I_F = 300 A, V_{GE} = 0 V I_F = 300 A, V_{GE} = 0 V I_F = 300 A, V_{GE} = 0 V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	V_F		1,45 1,35 1,30	1,85	V V V
Rückstromspitze Peak reverse recovery current	I_F = 300 A, - di_F/dt = 2300 A/µs (T_{vj}=150°C) V_R = 300 V V_{GE} = -15 V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	I_{RM}		120 190 200		A A A
Sperrverzögerungsladung Recovered charge	I_F = 300 A, - di_F/dt = 2300 A/µs (T_{vj}=150°C) V_R = 300 V V_{GE} = -15 V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	Q_r		9,70 29,0 34,0		µC µC µC
Abschaltenergie pro Puls Reverse recovery energy	I_F = 300 A, - di_F/dt = 2300 A/µs (T_{vj}=150°C) V_R = 300 V V_{GE} = -15 V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	E_{rec}		2,40 6,20 7,00		mJ mJ mJ
Wärmewiderstand, Chip bis Gehäuse Thermal resistance, junction to case	pro Diode / per diode		R_{thJC}			0,22	K/W
Wärmewiderstand, Gehäuse bis Kühlkörper Thermal resistance, case to heatsink	pro Diode / per diode λ_{Paste} = 1 W/(m·K) / λ_{grease} = 1 W/(m·K)		R_{thCH}		0,077		K/W

Vorläufige Daten
Preliminary Data

IGBT, T2 / T3 / IGBT, T2 / T3

Höchstzulässige Werte / Maximum Rated Values

Kollektor-Emitter-Sperrspannung Collector-emitter voltage	T_{vj} = 25°C	V_{CES}	650	V
Kollektor-Dauergleichstrom Continuous DC collector current	T_C = 52°C, T_{vj} = 175°C T_C = 25°C, T_{vj} = 175°C	$I_{C\,nom}$ I_C	300 336	A A
Periodischer Kollektor-Spitzenstrom Repetitive peak collector current	t_P = 1 ms	I_{CRM}	600	A
Gesamt-Verlustleistung Total power dissipation	T_C = 25°C, T_{vj} = 175°C	P_{tot}	880	W
Gate-Emitter-Spitzenspannung Gate-emitter peak voltage		V_{GES}	+/-20	V

Charakteristische Werte / Characteristic Values

			min.	typ.	max.	
Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage	I_C = 300 A, V_{GE} = 15 V I_C = 300 A, V_{GE} = 15 V I_C = 300 A, V_{GE} = 15 V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	$V_{CE\,sat}$		1,55 1,70 1,75	1,95	V V V
Gate-Schwellenspannung Gate threshold voltage	I_C = 4,80 mA, V_{CE} = V_{GE}, T_{vj} = 25°C		V_{GEth}	4,9	5,8	6,5	V
Gateladung Gate charge	V_{GE} = -15 V ... +15 V		Q_G		3,20		µC
Interner Gatewiderstand Internal gate resistor	T_{vj} = 25°C		R_{Gint}		1,0		Ω
Eingangskapazität Input capacitance	f = 1 MHz, T_{vj} = 25°C, V_{CE} = 25 V, V_{GE} = 0 V		C_{ies}		18,5		nF
Rückwirkungskapazität Reverse transfer capacitance	f = 1 MHz, T_{vj} = 25°C, V_{CE} = 25 V, V_{GE} = 0 V		C_{res}		0,57		nF
Kollektor-Emitter-Reststrom Collector-emitter cut-off current	V_{CE} = 650 V, V_{GE} = 0 V, T_{vj} = 25°C		I_{CES}			1,0	mA
Gate-Emitter-Reststrom Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C		I_{GES}			100	nA
Einschaltverzögerungszeit, induktive Last Turn-on delay time, inductive load	I_C = 300 A, V_{CE} = 300 V V_{GE} = ±15 V R_{Gon} = 1,5 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	$t_{d\,on}$		0,08 0,10 0,10		µs µs µs
Anstiegszeit, induktive Last Rise time, inductive load	I_C = 300 A, V_{CE} = 300 V V_{GE} = ±15 V R_{Gon} = 1,5 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	t_r		0,07 0,08 0,08		µs µs µs
Abschaltverzögerungszeit, induktive Last Turn-off delay time, inductive load	I_C = 300 A, V_{CE} = 300 V V_{GE} = ±15 V R_{Goff} = 1,5 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	$t_{d\,off}$		0,35 0,38 0,39		µs µs µs
Fallzeit, induktive Last Fall time, inductive load	I_C = 300 A, V_{CE} = 300 V V_{GE} = ±15 V R_{Goff} = 1,5 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	t_f		0,09 0,12 0,12		µs µs µs
Einschaltverlustenergie pro Puls Turn-on energy loss per pulse	I_C = 300 A, V_{CE} = 300 V, L_S = 35 nH V_{GE} = ±15 V, di/dt = 3150 A/µs (T_{vj}=150°C) R_{Gon} = 1,5 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	E_{on}		4,50 6,80 7,95		mJ mJ mJ
Abschaltverlustenergie pro Puls Turn-off energy loss per pulse	I_C = 300 A, V_{CE} = 300 V, L_S = 35 nH V_{GE} = ±15 V, du/dt = 3350 V/µs (T_{vj}=150°C) R_{Goff} = 1,5 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	E_{off}		14,5 19,0 20,0		mJ mJ mJ
Kurzschlußverhalten SC data	V_{GE} ≤ 15 V, V_{CC} = 360 V V_{CEmax} = V_{CES} -L_{sCE} ·di/dt	t_P ≤ 10 µs, T_{vj} = 25°C t_P ≤ 10 µs, T_{vj} = 150°C	I_{SC}		1800 1400		A A
Wärmewiderstand, Chip bis Gehäuse Thermal resistance, junction to case	pro IGBT / per IGBT		R_{thJC}			0,17	K/W
Wärmewiderstand, Gehäuse bis Kühlkörper Thermal resistance, case to heatsink	pro IGBT / per IGBT λ_{Paste} = 1 W/(m·K) / λ_{grease} = 1 W/(m·K)		R_{thCH}		0,074		K/W

prepared by: MK	date of publication: 2013-03-08
approved by: MK	revision: 2.0

Vorläufige Daten
Preliminary Data

Diode, D1 / D4 / Diode, D1 / D4

Höchstzulässige Werte / Maximum Rated Values

Periodische Spitzensperrspannung Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}	1200		V
Dauergleichstrom Continuous DC forward current		I_F	300		A
Periodischer Spitzenstrom Repetitive peak forward current	t_P = 1 ms	I_{FRM}	600		A
Grenzlastintegral I²t - value	V_R = 0 V, t_P = 10 ms, T_{vj} = 125°C V_R = 0 V, t_P = 10 ms, T_{vj} = 150°C	I²t	15500 11500		A²s A²s

Charakteristische Werte / Characteristic Values

			min.	typ.	max.	
Durchlassspannung Forward voltage	I_F = 300 A, V_{GE} = 0 V I_F = 300 A, V_{GE} = 0 V I_F = 300 A, V_{GE} = 0 V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	V_F		1,65 1,65 1,65	2,15	V V V
Rückstromspitze Peak reverse recovery current	I_F = 300 A, - di_F/dt = 3150 A/µs (T_{vj}=150°C) V_R = 300 V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	I_{RM}		215 275 290		A A A
Sperrverzögerungsladung Recovered charge	I_F = 300 A, - di_F/dt = 3150 A/µs (T_{vj}=150°C) V_R = 300 V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	Q_r		30,5 57,0 66,0		µC µC µC
Abschaltenergie pro Puls Reverse recovery energy	I_F = 300 A, - di_F/dt = 3150 A/µs (T_{vj}=150°C) V_R = 300 V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	E_{rec}		8,95 17,0 19,5		mJ mJ mJ
Wärmewiderstand, Chip bis Gehäuse Thermal resistance, junction to case	pro Diode / per diode		R_{thJC}			0,16	K/W
Wärmewiderstand, Gehäuse bis Kühlkörper Thermal resistance, case to heatsink	pro Diode / per diode λ_{Paste} = 1 W/(m·K) / λ_{grease} = 1 W/(m·K)		R_{thCH}		0,056		K/W

NTC-Widerstand / NTC-Thermistor

Charakteristische Werte / Characteristic Values

			min.	typ.	max.	
Nennwiderstand Rated resistance	T_C = 25°C	R_{25}		5,00		kΩ
Abweichung von R100 Deviation of R100	T_C = 100°C, R_{100} = 493 Ω	ΔR/R	-5		5	%
Verlustleistung Power dissipation	T_C = 25°C	P_{25}			20,0	mW
B-Wert B-value	$R_2 = R_{25} \exp [B_{25/50}(1/T_2 - 1/(298{,}15\ K))]$	$B_{25/50}$		3375		K
B-Wert B-value	$R_2 = R_{25} \exp [B_{25/80}(1/T_2 - 1/(298{,}15\ K))]$	$B_{25/80}$		3411		K
B-Wert B-value	$R_2 = R_{25} \exp [B_{25/100}(1/T_2 - 1/(298{,}15\ K))]$	$B_{25/100}$		3433		K

Angaben gemäß gültiger Application Note.
Specification according to the valid application note.

prepared by: MK	date of publication: 2013-03-08
approved by: MK	revision: 2.0

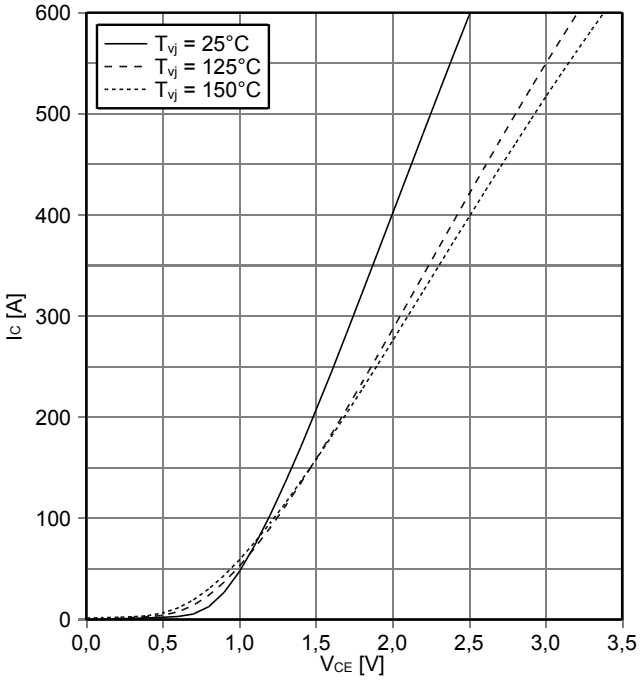
Vorläufige Daten
Preliminary Data

Modul / Module

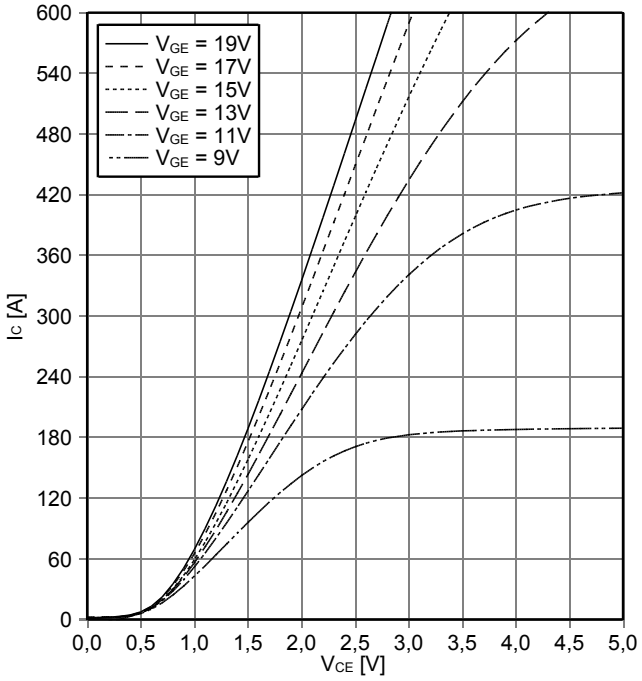
Isolations-Prüfspannung Isolation test voltage	RMS, f = 50 Hz, t = 1 min.	V_{ISOL}		2,5		kV
Material Modulgrundplatte Material of module baseplate				Cu		
Innere Isolation Internal isolation	Basisisolierung (Schutzklasse 1, EN61140) basic insulation (class 1, IEC 61140)			Al_2O_3		
Kriechstreck Creepage distance	Kontakt - Kühlkörper / terminal to heatsink Kontakt - Kontakt / terminal to terminal			25,0 12,5		mm
Luftstrecke Clearance	Kontakt - Kühlkörper / terminal to heatsink Kontakt - Kontakt / terminal to terminal			11,0 7,0		mm
Vergleichszahl der Kriechwegbildung Comperative tracking index		CTI		> 200		
			min.	typ.	max.	
Modulstreuinduktivität Stray inductance module		L_{sCE}		38		nH
Modulleitungswiderstand, Anschlüsse - Chip Module lead resistance, terminals - chip	T_C = 25°C, pro Schalter / per switch	$R_{CC'+EE'}$		0,75		mΩ
Höchstzulässige Sperrschichttemperatur Maximum junction temperature	Wechselrichter, Brems-Chopper / inverter, brake-chopper	$T_{vj\ max}$			175	°C
Temperatur im Schaltbetrieb Temperature under switching conditions	Wechselrichter, Brems-Chopper / inverter, brake-chopper	$T_{vj\ op}$	-40		150	°C
Lagertemperatur Storage temperature		T_{stg}	-40		125	°C
Anzugsdrehmoment f. Modulmontage Mounting torque for modul mounting	Schraube M5 - Montage gem. gültiger Applikationsschrift Screw M5 - Mounting according to valid application note	M	3,00	-	6,00	Nm
Anzugsdrehmoment f. elektr. Anschlüsse Terminal connection torque	Schraube M6 - Montage gem. gültiger Applikationsschrift Screw M6 - Mounting according to valid application note	M	3,0	-	6,0	Nm
Gewicht Weight		G		400		g

Vorläufige Daten
Preliminary Data

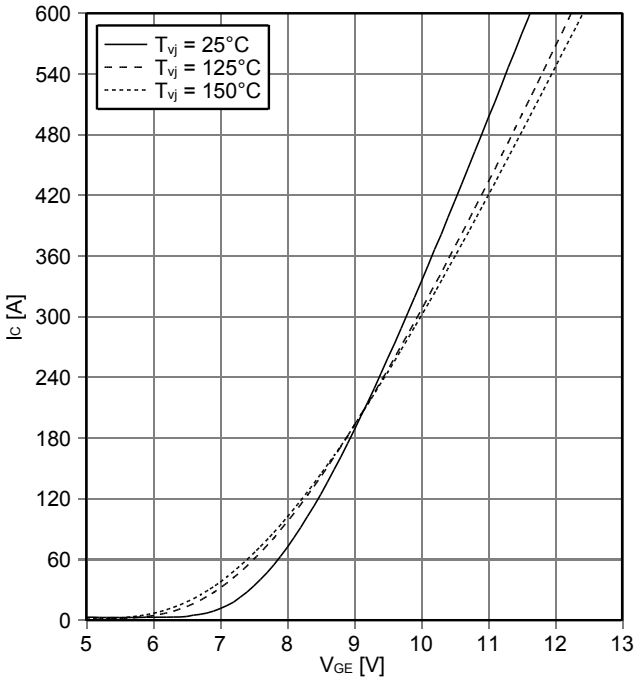
Ausgangskennlinie IGBT, T1 / T4 (typisch)
output characteristic IGBT, T1 / T4 (typical)
$I_C = f(V_{CE})$
V_{GE} = 15 V



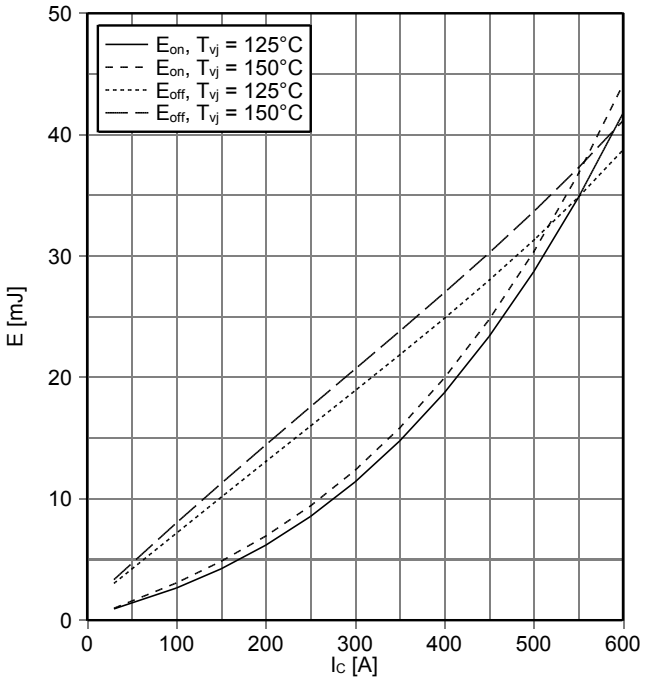
Ausgangskennlinienfeld IGBT, T1 / T4 (typisch)
output characteristic IGBT, T1 / T4 (typical)
$I_C = f(V_{CE})$
T_{vj} = 150°C



Übertragungscharakteristik IGBT, T1 / T4 (typisch)
transfer characteristic IGBT, T1 / T4(typical)
$I_C = f(V_{GE})$
V_{CE} = 20 V



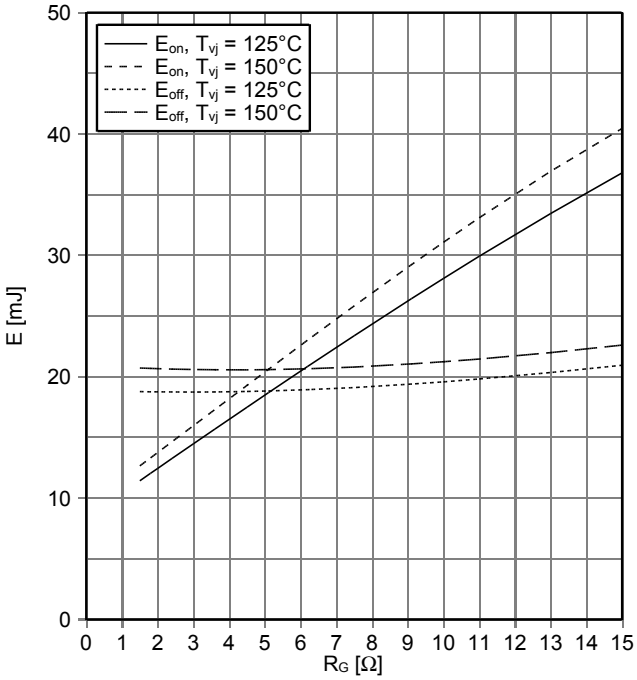
SchaltverlusteIGBT, T1 / T4 (typisch)
switching losses IGBT, T1 / T4 (typical)
$E_{on} = f(I_C)$, $E_{off} = f(I_C)$
V_{GE} = ±15 V, R_{Gon} = 1.5 Ω, R_{Goff} = 1.5 Ω, V_{CE} = 300 V



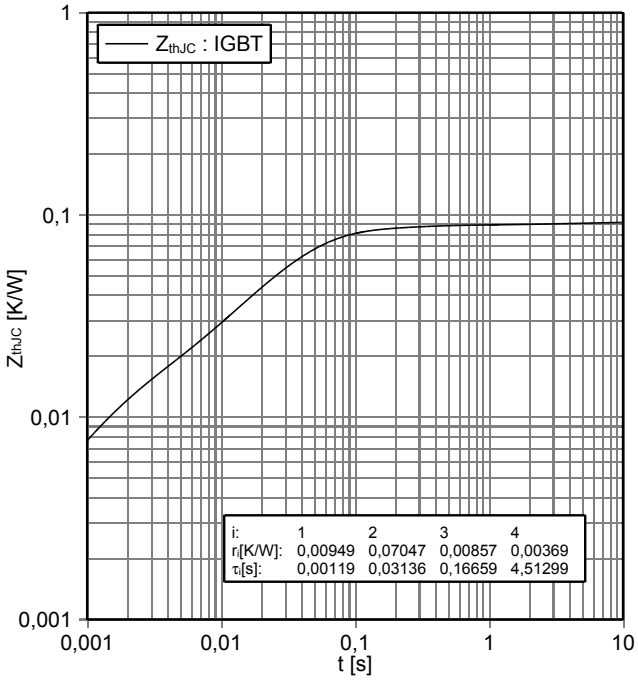
prepared by: MK	date of publication: 2013-03-08
approved by: MK	revision: 2.0

Vorläufige Daten
Preliminary Data

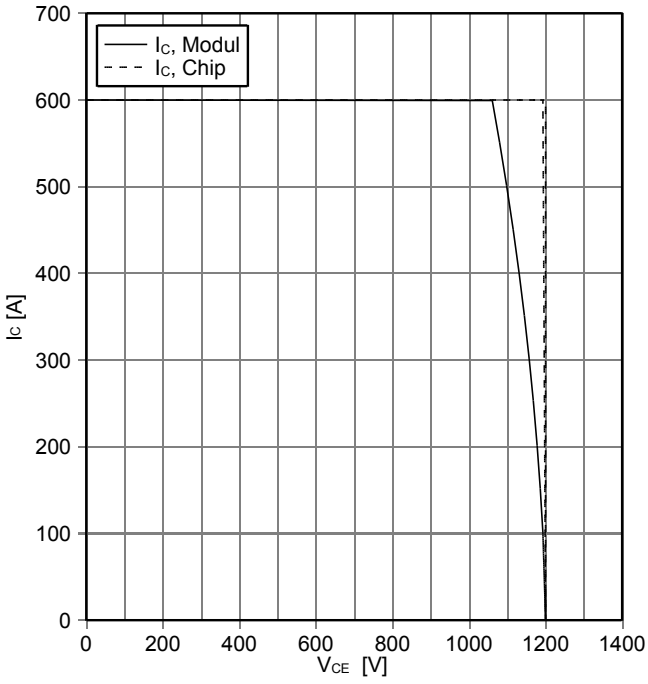
SchaltverlusteIGBT, T1 / T4 (typisch)
switching losses IGBT, T1 / T4 (typical)
$E_{on} = f(R_G)$, $E_{off} = f(R_G)$
V_{GE} = ±15 V, I_C = 300 A, V_{CE} = 300 V



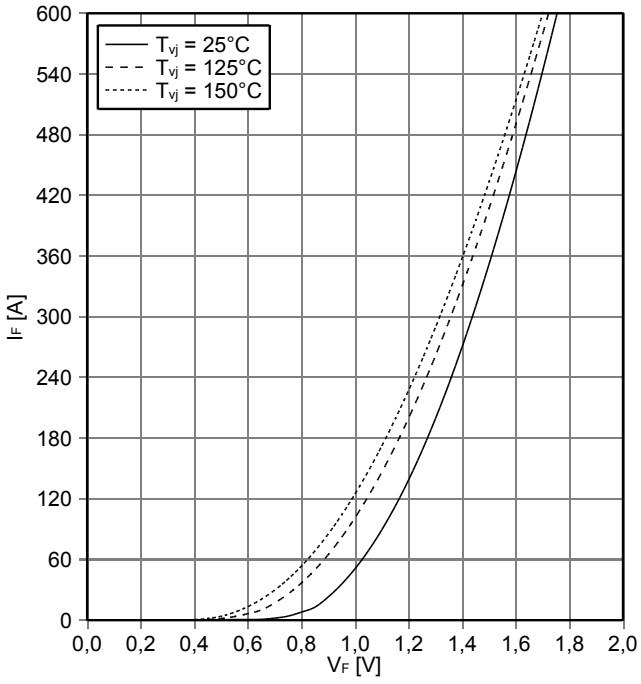
Transienter Wärmewiderstand IGBT, T1 / T4
transient thermal impedance IGBT, T1 / T4
$Z_{thJC} = f(t)$



Sicherer Rückwärts-Arbeitsbereich IGBT, T1 / T4 (RBSOA)
reverse bias safe operating area IGBT, T1 / T4 (RBSOA)
$I_C = f(V_{CE})$
V_{GE} = ±15 V, R_{Goff} = 1.5 Ω, T_{vj} = 150°C



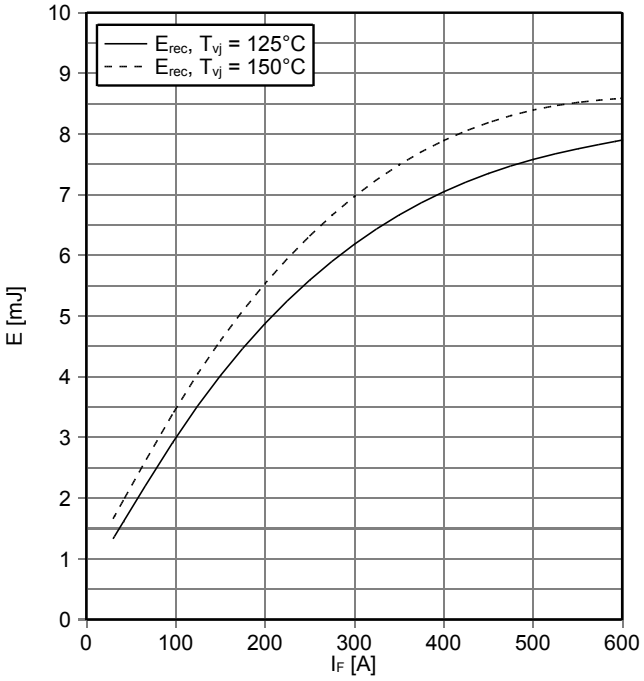
Durchlasskennlinie der Diode, D2 / D3 (typisch)
forward characteristic of Diode, D2 / D3 (typical)
$I_F = f(V_F)$



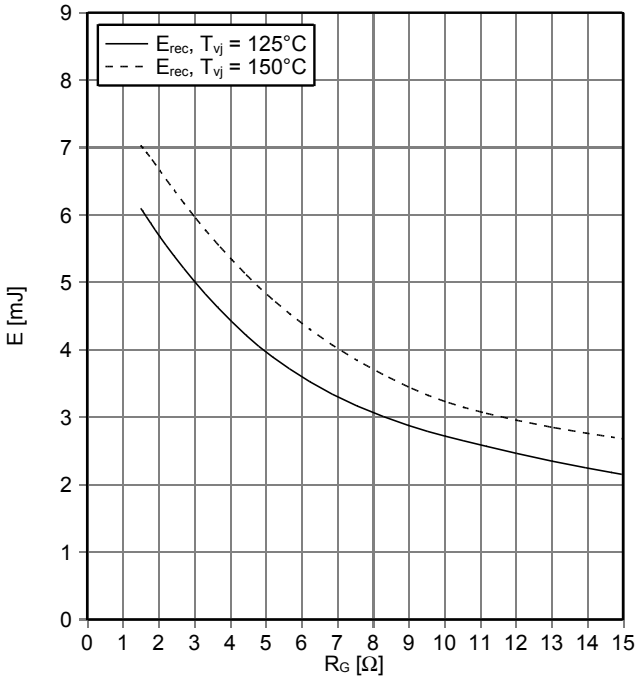
prepared by: MK	date of publication: 2013-03-08
approved by: MK	revision: 2.0

Vorläufige Daten
Preliminary Data

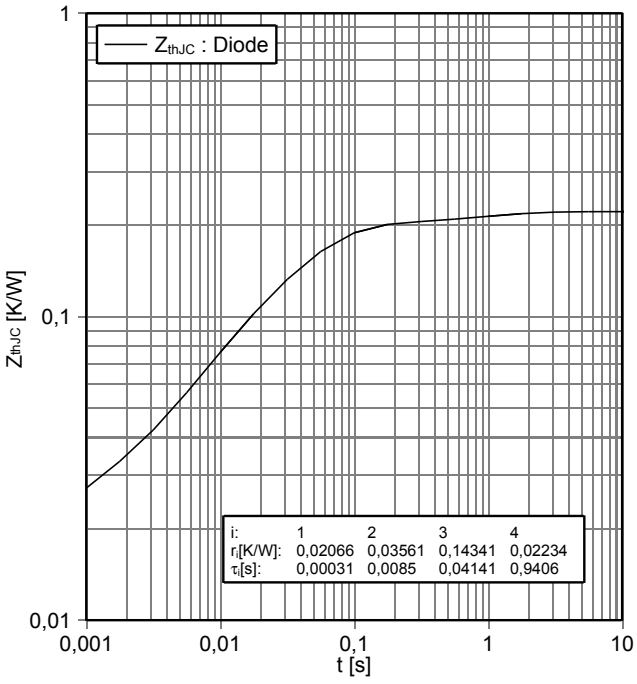
Schaltverluste Diode, D2 / D3 (typisch)
switching losses Diode, D2 / D3 (typical)
$E_{rec} = f(I_F)$
$R_{Gon} = 1.5\ \Omega$, $V_{CE} = 300$ V



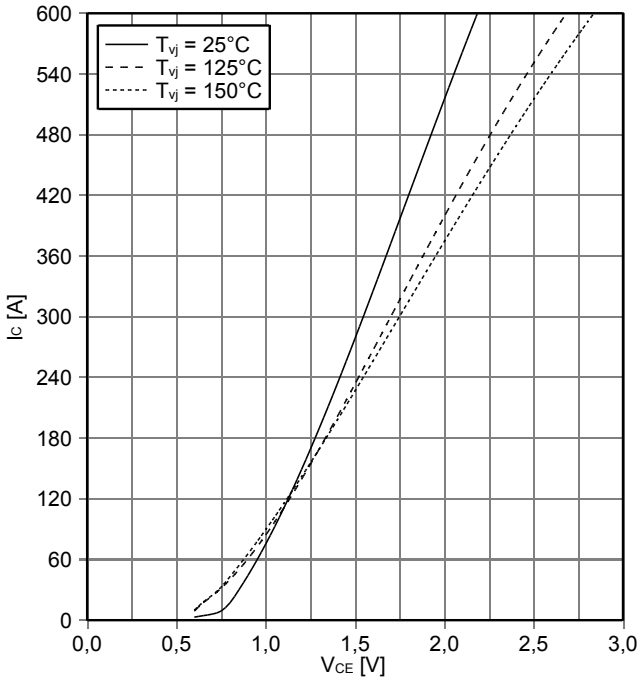
Schaltverluste Diode, D2 / D3 (typisch)
switching losses Diode, D2 / D3 (typical)
$E_{rec} = f(R_G)$
$I_F = 300$ A, $V_{CE} = 300$ V



Transienter Wärmewiderstand Diode, D2 / D3
transient thermal impedance Diode, D2 / D3
$Z_{thJC} = f(t)$



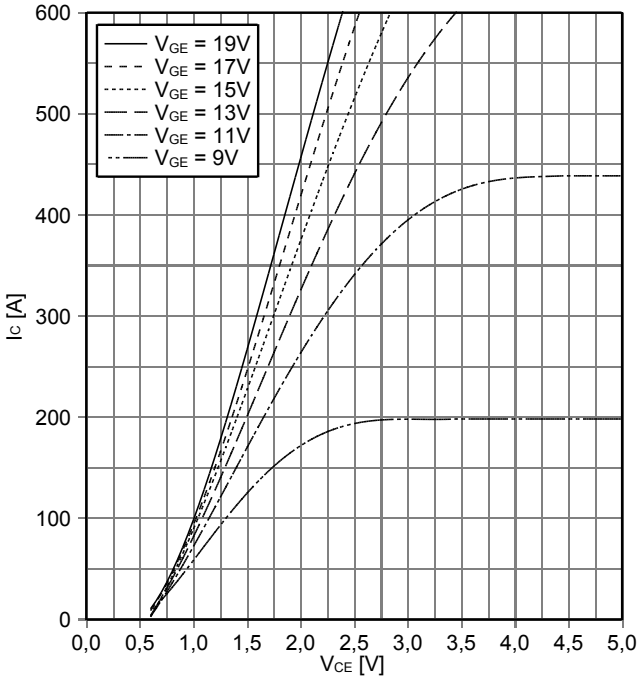
Ausgangskennlinie IGBT, T2 / T3 (typisch)
output characteristic IGBT, T2 / T3 (typical)
$I_C = f(V_{CE})$
$V_{GE} = 15$ V



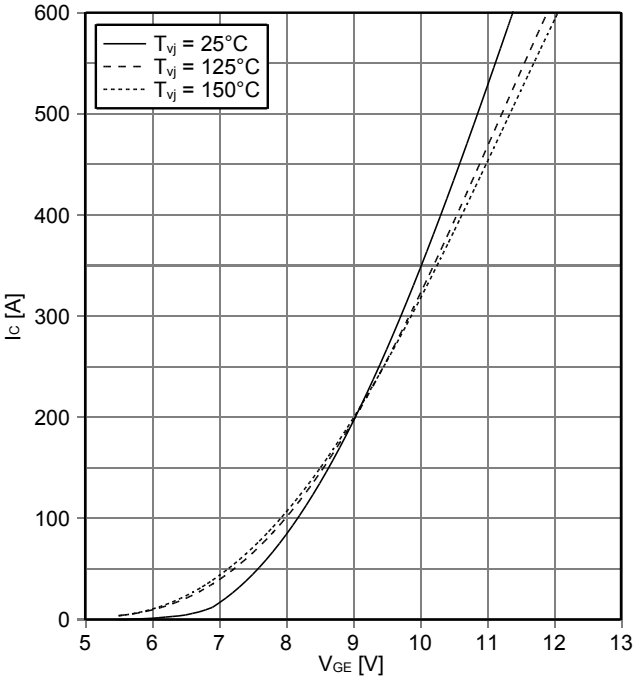
prepared by: MK	date of publication: 2013-03-08
approved by: MK	revision: 2.0

Vorläufige Daten
Preliminary Data

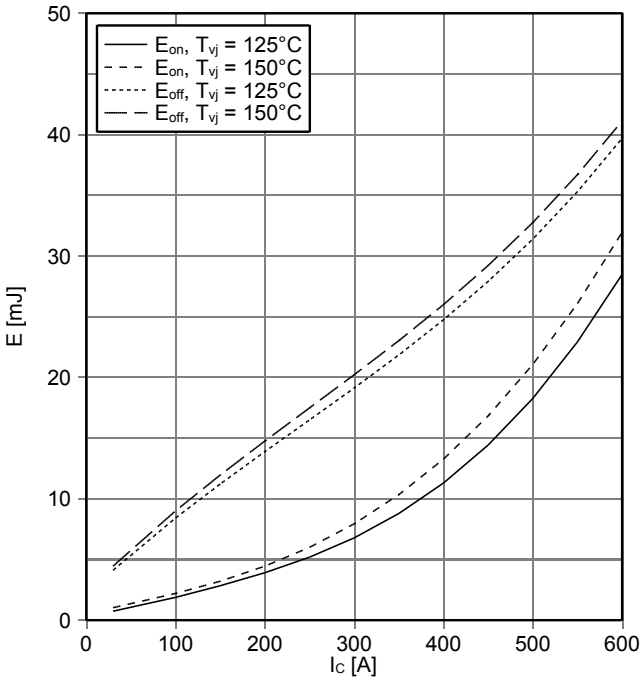
Ausgangskennlinienfeld IGBT, T2 / T3 (typisch)
output characteristic IGBT, T2 / T3 (typical)
$I_C = f(V_{CE})$
$T_{vj} = 150°C$



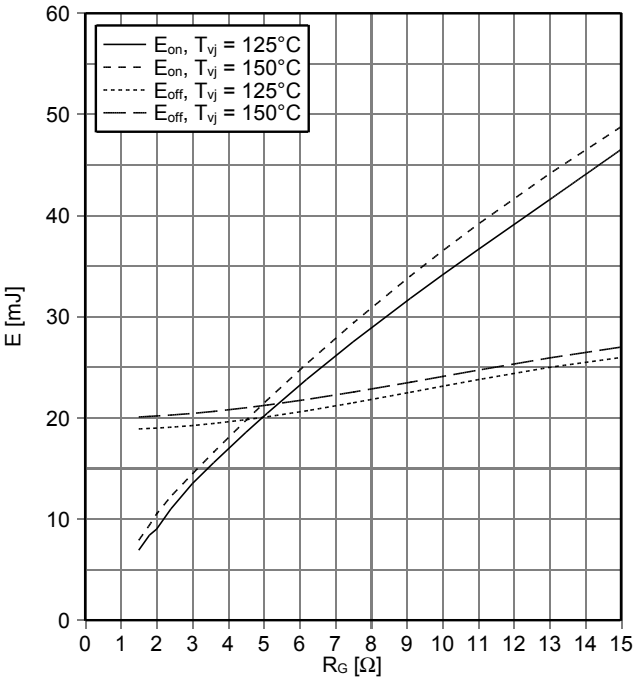
Übertragungscharakteristik IGBT, T2 / T3 (typisch)
transfer characteristic IGBT, T2 / T3(typical)
$I_C = f(V_{GE})$
$V_{CE} = 20$ V



SchaltverlustelGBT, T2 / T3 (typisch)
switching losses IGBT, T2 / T3 (typical)
$E_{on} = f(I_C)$, $E_{off} = f(I_C)$
$V_{GE} = \pm 15$ V, $R_{Gon} = 1.5\ \Omega$, $R_{Goff} = 1.5\ \Omega$, $V_{CE} = 300$ V



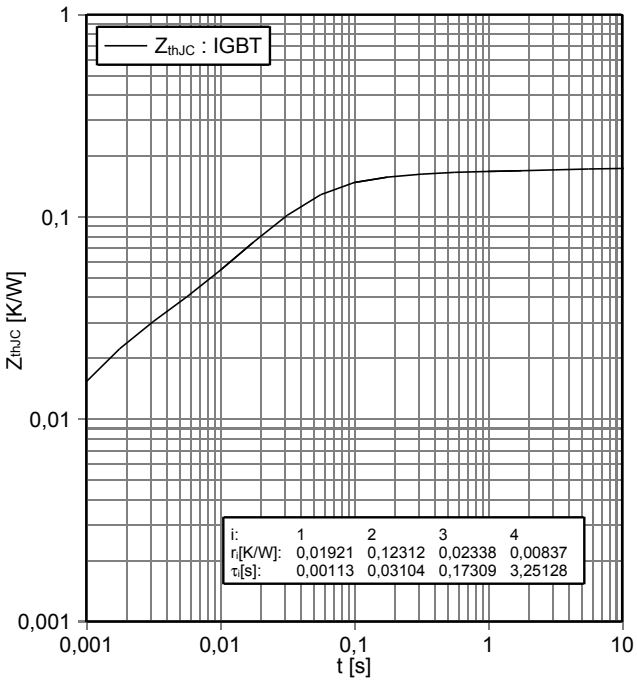
SchaltverlustelGBT, T2 / T3 (typisch)
switching losses IGBT, T2 / T3 (typical)
$E_{on} = f(R_G)$, $E_{off} = f(R_G)$
$V_{GE} = \pm 15$ V, $I_C = 300$ A, $V_{CE} = 300$ V



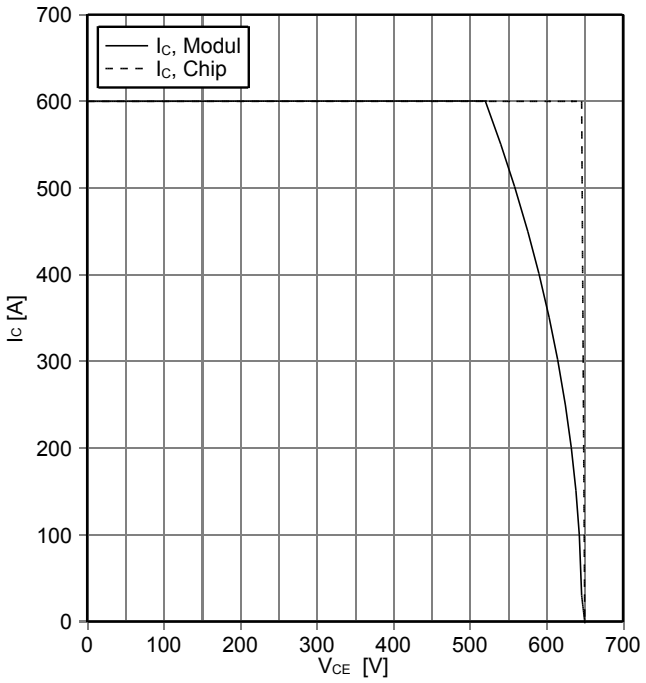
prepared by: MK	date of publication: 2013-03-08
approved by: MK	revision: 2.0

Vorläufige Daten
Preliminary Data

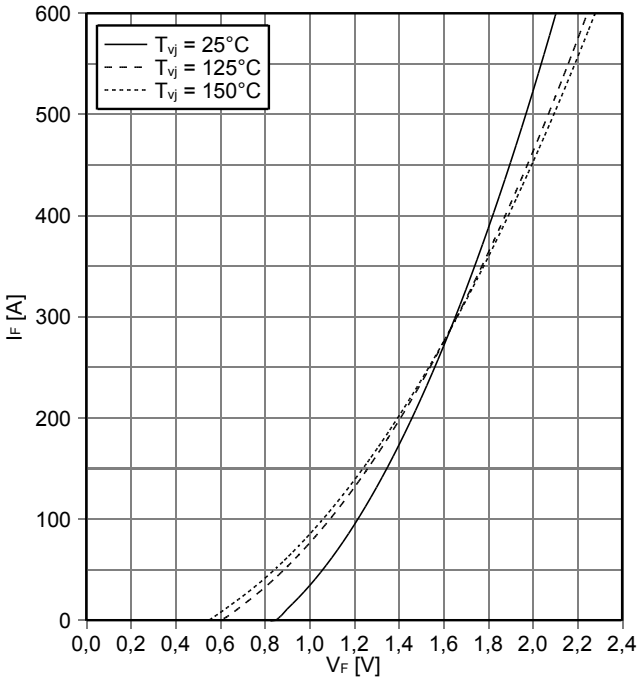
Transienter Wärmewiderstand IGBT, T2 / T3
transient thermal impedance IGBT, T2 / T3
$Z_{thJC} = f(t)$



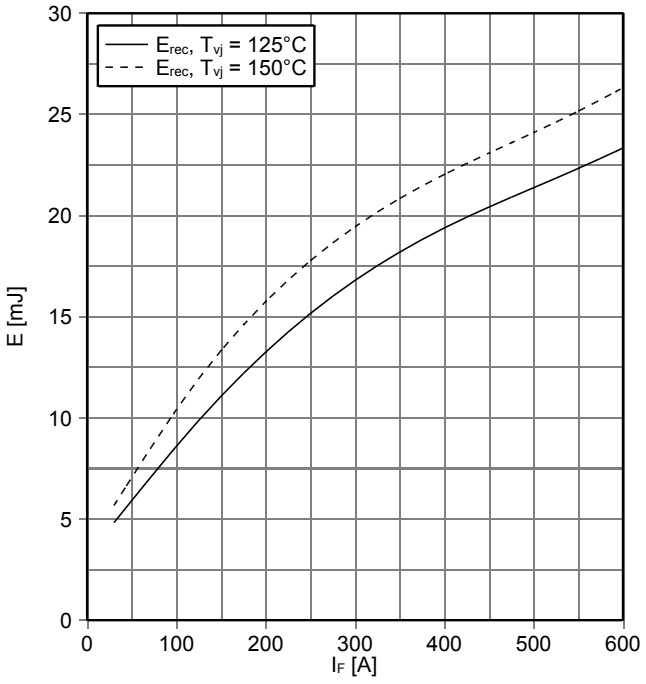
Sicherer Rückwärts-Arbeitsbereich IGBT, T2 / T3 (RBSOA)
reverse bias safe operating area IGBT, T2 / T3 (RBSOA)
$I_C = f(V_{CE})$
$V_{GE} = \pm 15$ V, $R_{Goff} = 1.5\ \Omega$, $T_{vj} = 150°C$



Durchlasskennlinie der Diode, D1 / D4 (typisch)
forward characteristic of Diode, D1 / D4 (typical)
$I_F = f(V_F)$



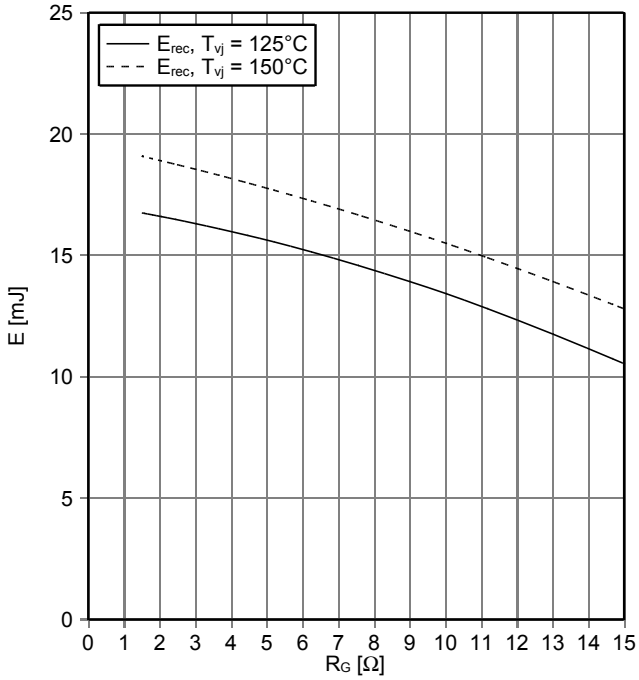
Schaltverluste Diode, D1 / D4 (typisch)
switching losses Diode, D1 / D4 (typical)
$E_{rec} = f(I_F)$
$R_{Gon} = 1.5\ \Omega$, $V_{CE} = 300$ V



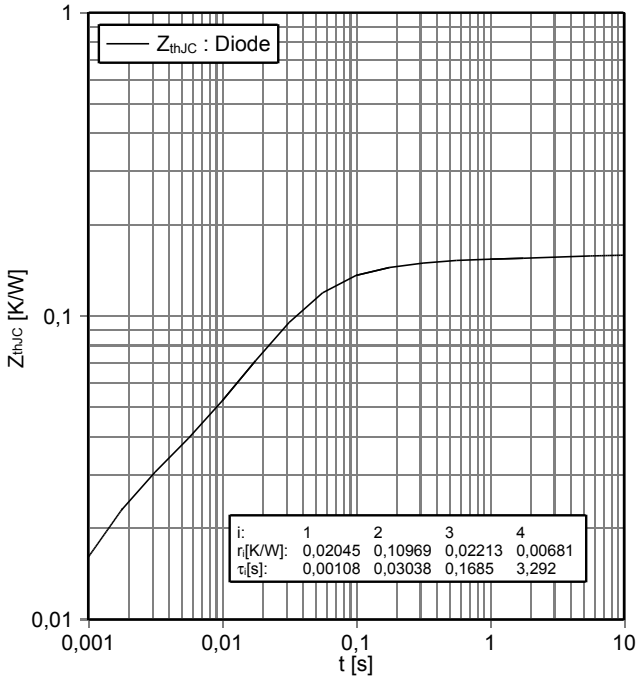
prepared by: MK	date of publication: 2013-03-08
approved by: MK	revision: 2.0

Vorläufige Daten
Preliminary Data

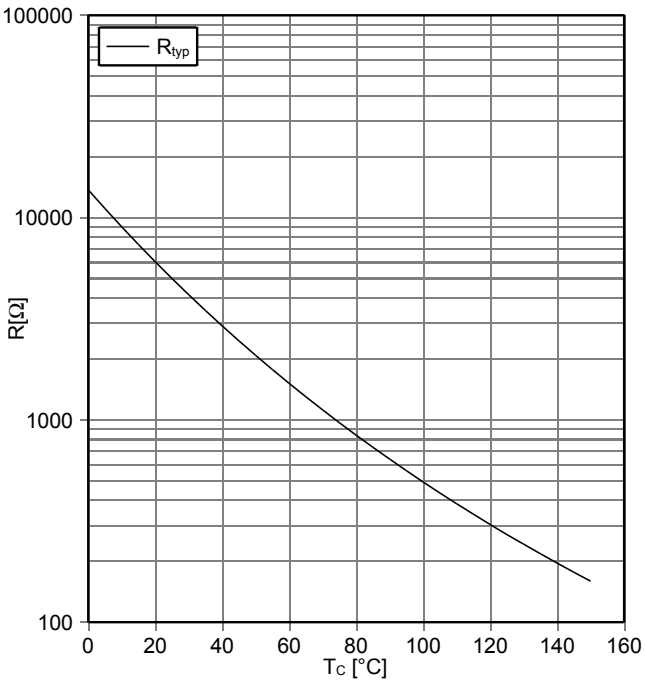
Schaltverluste Diode, D1 / D4 (typisch)
switching losses Diode, D1 / D4 (typical)
$E_{rec} = f(R_G)$
$I_F = 300\ A$, $V_{CE} = 300\ V$



Transienter Wärmewiderstand Diode, D1 / D4
transient thermal impedance Diode, D1 / D4
$Z_{thJC} = f(t)$



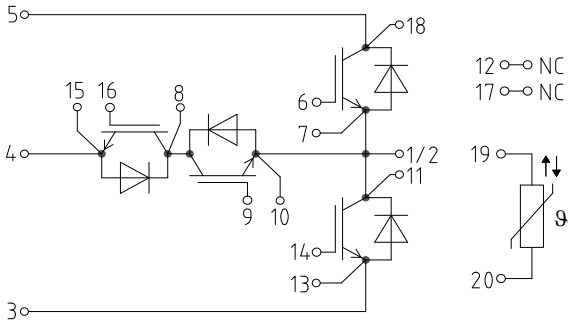
NTC-Widerstand-Temperaturkennlinie (typisch)
NTC-Thermistor-temperature characteristic (typical)
$R = f(T)$



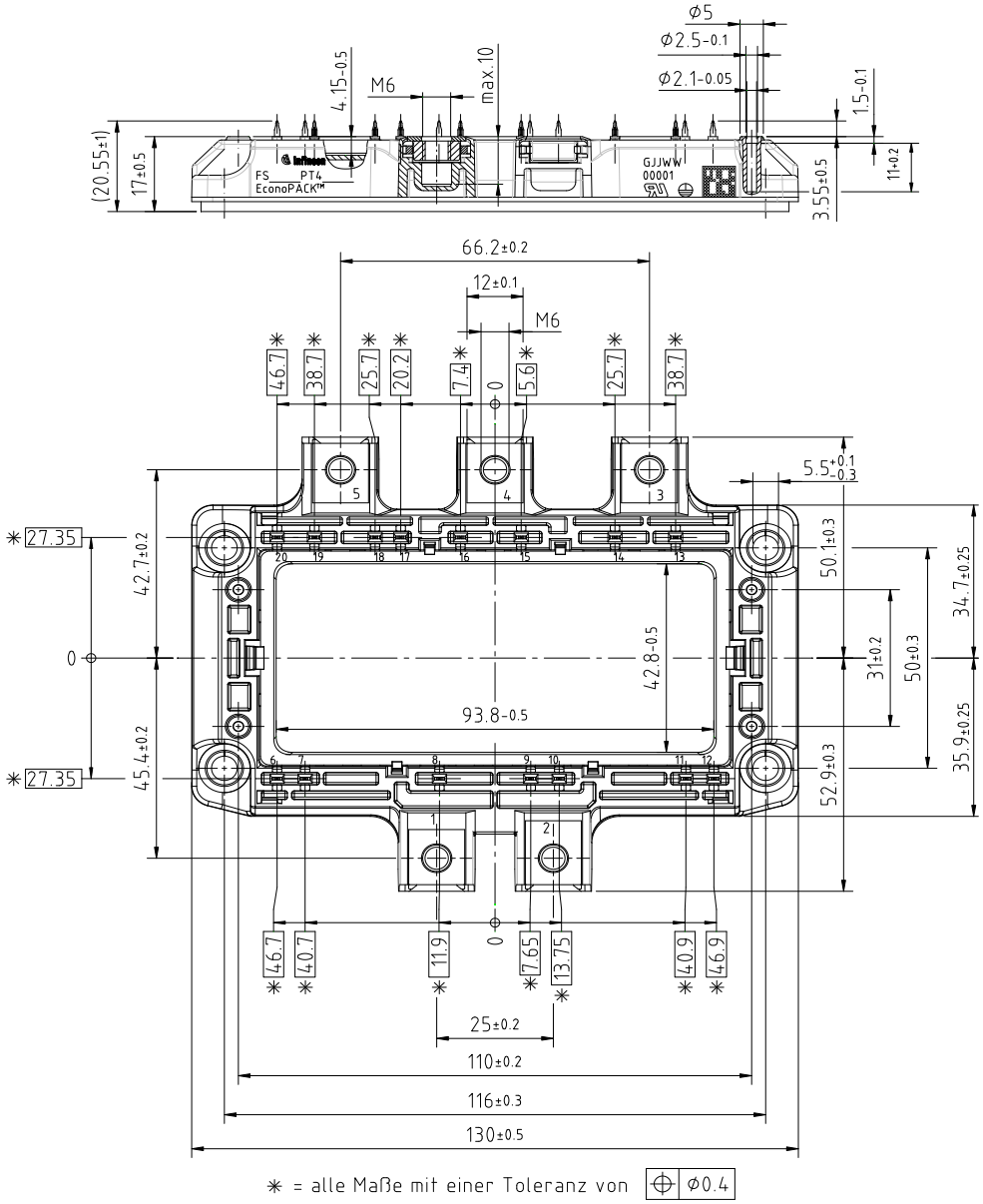
prepared by: MK	date of publication: 2013-03-08
approved by: MK	revision: 2.0

Vorläufige Daten
Preliminary Data

Schaltplan / circuit_diagram_headline



Gehäuseabmessungen / package outlines



prepared by: MK	date of publication: 2013-03-08
approved by: MK	revision: 2.0

Vorläufige Daten
Preliminary Data

Nutzungsbedingungen

Die in diesem Produktdatenblatt enthaltenen Daten sind ausschließlich für technisch geschultes Fachpersonal bestimmt. Die Beurteilung der Eignung dieses Produktes für Ihre Anwendung sowie die Beurteilung der Vollständigkeit der bereitgestellten Produktdaten für diese Anwendung obliegt Ihnen bzw. Ihren technischen Abteilungen.

In diesem Produktdatenblatt werden diejenigen Merkmale beschrieben, für die wir eine liefervertragliche Gewährleistung übernehmen. Eine solche Gewährleistung richtet sich ausschließlich nach Maßgabe der im jeweiligen Liefervertrag enthaltenen Bestimmungen. Garantien jeglicher Art werden für das Produkt und dessen Eigenschaften keinesfalls übernommen. Die Angaben in den gültigen Anwendungs- und Montagehinweisen des Moduls sind zu beachten.

Sollten Sie von uns Produktinformationen benötigen, die über den Inhalt dieses Produktdatenblatts hinausgehen und insbesondere eine spezifische Verwendung und den Einsatz dieses Produktes betreffen, setzen Sie sich bitte mit dem für Sie zuständigen Vertriebsbüro in Verbindung (siehe www.infineon.com, Vertrieb&Kontakt). Für Interessenten halten wir Application Notes bereit.

Aufgrund der technischen Anforderungen könnte unser Produkt gesundheitsgefährdende Substanzen enthalten. Bei Rückfragen zu den in diesem Produkt jeweils enthaltenen Substanzen setzen Sie sich bitte ebenfalls mit dem für Sie zuständigen Vertriebsbüro in Verbindung.

Sollten Sie beabsichtigen, das Produkt in Anwendungen der Luftfahrt, in gesundheits- oder lebensgefährdenden oder lebenserhaltenden Anwendungsbereichen einzusetzen, bitten wir um Mitteilung. Wir weisen darauf hin, dass wir für diese Fälle
- die gemeinsame Durchführung eines Risiko- und Qualitätsassessments;
- den Abschluss von speziellen Qualitätssicherungsvereinbarungen;
- die gemeinsame Einführung von Maßnahmen zu einer laufenden Produktbeobachtung dringend empfehlen und gegebenenfalls die Belieferung von der Umsetzung solcher Maßnahmen abhängig machen.

Soweit erforderlich, bitten wir Sie, entsprechende Hinweise an Ihre Kunden zu geben.

Inhaltliche Änderungen dieses Produktdatenblatts bleiben vorbehalten.

Terms & Conditions of usage

The data contained in this product data sheet is exclusively intended for technically trained staff. You and your technical departments will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to such application.

This product data sheet is describing the characteristics of this product for which a warranty is granted. Any such warranty is granted exclusively pursuant the terms and conditions of the supply agreement. There will be no guarantee of any kind for the product and its characteristics. The information in the valid application- and assembly notes of the module must be considered.

Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of our product, please contact the sales office, which is responsible for you (see www.infineon.com). For those that are specifically interested we may provide application notes.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact the sales office, which is responsible for you.

Should you intend to use the Product in aviation applications, in health or live endangering or life support applications, please notify. Please note, that for any such applications we urgently recommend
- to perform joint Risk and Quality Assessments;
- the conclusion of Quality Agreements;
- to establish joint measures of an ongoing product survey, and that we may make delivery depended on the realization of any such measures.

If and to the extent necessary, please forward equivalent notices to your customers.

Changes of this product data sheet are reserved.

prepared by: MK	date of publication: 2013-03-08
approved by: MK	revision: 2.0