ANTREX Electronics

Electronic Components Sourcing Information

Product Reference Information

Part Number:	FS450R12OE4PBOSA1
Manufacturer:	Infineon Technologies
Package:	Module
Availability:	Please confirm with sales

Product Page:

https://antrexco.com/product/details/infineon-technologies/fs450r12oe4pbosa1.html

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Quality & Trust

New & Original Components

Supplier verification and packaging condition review

CoC / RoHS / REACH documents available on request

Secure sourcing support for OEM / EMS projects

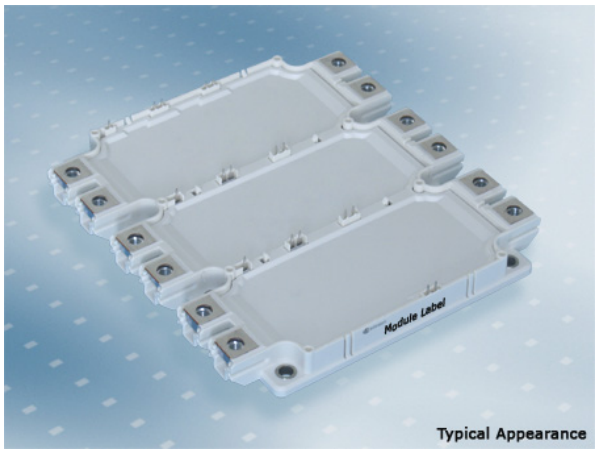
Note:

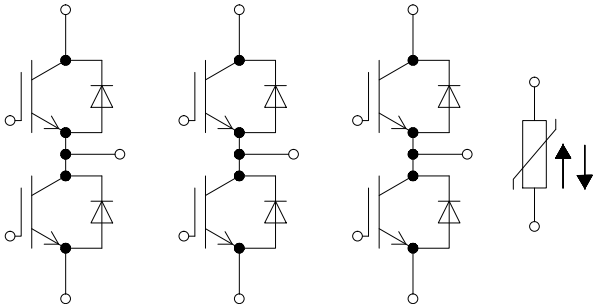
This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.

EconoPACK™+ Modul mit Trench/Feldstopp IGBT4 und Emitter Controlled HE Diode und PressFIT / bereits aufgetragenem Thermal Interface Material

EconoPACK™+ module with Trench/Fieldstop IGBT4 and Emitter Controlled HE diode and PressFIT / pre-applied Thermal Interface Material





V_{CES} = 1200V
$I_{C\ nom}$ = 450A / I_{CRM} = 900A

Typische Anwendungen
- Hochleistungsumrichter
- Hybrid-Nutzfahrzeuge
- Motorantriebe
- Solar Anwendungen
- USV-Systeme

Typical Applications
- High power converters
- Commercial Agriculture Vehicles
- Motor drives
- Solar applications
- UPS systems

Elektrische Eigenschaften
- Hohe Kurzschlussrobustheit
- Hohe Stoßstromfestigkeit
- Sehr große Robustheit
- $T_{vj\ op}$ = 150°C
- Trench IGBT 4

Electrical Features
- High short-circuit capability
- High surge current capability
- Unbeatable robustness
- $T_{vj\ op}$ = 150°C
- Trench IGBT 4

Mechanische Eigenschaften
- Hohe mechanische Robustheit
- Integrierter NTC Temperatur Sensor
- PressFIT Verbindungstechnik
- RoHS konform
- Thermisches Interface Material bereits aufgetragen

Mechanical Features
- High mechanical robustness
- Integrated NTC temperature sensor
- PressFIT contact technology
- RoHS compliant
- Pre-applied Thermal Interface Material

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

IGBT,Wechselrichter / IGBT,Inverter

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_H = 60°C, $T_{vj\,max}$ = 175°C	$I_{C\,nom}$	450	A
Periodischer Kollektor-Spitzenstrom Repetitive peak collector current	t_P = 1 ms	I_{CRM}	900	A
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 = 450 A, V_{GE} = 15 V T_{vj} = 25°C I_C = 450 A, V_{GE} = 15 V T_{vj} = 125°C I_C = 450 A, V_{GE} = 15 V T_{vj} = 150°C	$V_{CE\,sat}$		1,75 2,00 2,05	2,10	V V V
Gate-Schwellenspannung Gate threshold voltage	I_C = 17,0 mA, V_{CE} = V_{GE}, T_{vj} = 25°C	V_{GEth}	5,20	5,80	6,40	V
Gateladung Gate charge	V_{GE} = -15 V ... +15 V	Q_G		3,30		µC
Interner Gatewiderstand Internal gate resistor	T_{vj} = 25°C	R_{Gint}		1,7		Ω
Eingangskapazität Input capacitance	f = 1 MHz, T_{vj} = 25°C, V_{CE} = 25 V, V_{GE} = 0 V	C_{ies}		28,0		nF
Rückwirkungskapazität Reverse transfer capacitance	f = 1 MHz, T_{vj} = 25°C, V_{CE} = 25 V, V_{GE} = 0 V	C_{res}		1,55		nF
Kollektor-Emitter-Reststrom Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C	I_{CES}			3,0	mA
Gate-Emitter-Reststrom Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C	I_{GES}			400	nA
Einschaltverzögerungszeit, induktive Last Turn-on delay time, inductive load	I_C = 450 A, V_{CE} = 600 V T_{vj} = 25°C V_{GE} = ±15 V T_{vj} = 125°C R_{Gon} = 1,0 Ω T_{vj} = 150°C	$t_{d\,on}$		0,19 0,22 0,22		µs µs µs
Anstiegszeit, induktive Last Rise time, inductive load	I_C = 450 A, V_{CE} = 600 V T_{vj} = 25°C V_{GE} = ±15 V T_{vj} = 125°C R_{Gon} = 1,0 Ω T_{vj} = 150°C	t_r		0,06 0,06 0,07		µs µs µs
Abschaltverzögerungszeit, induktive Last Turn-off delay time, inductive load	I_C = 450 A, V_{CE} = 600 V T_{vj} = 25°C V_{GE} = ±15 V T_{vj} = 125°C R_{Goff} = 1,0 Ω T_{vj} = 150°C	$t_{d\,off}$		0,44 0,55 0,57		µs µs µs
Fallzeit, induktive Last Fall time, inductive load	I_C = 450 A, V_{CE} = 600 V T_{vj} = 25°C V_{GE} = ±15 V T_{vj} = 125°C R_{Goff} = 1,0 Ω T_{vj} = 150°C	t_f		0,06 0,10 0,11		µs µs µs
Einschaltverlustenergie pro Puls Turn-on energy loss per pulse	I_C = 450 A, V_{CE} = 600 V, L_S = 35 nH T_{vj} = 25°C V_{GE} = ±15 V, di/dt = 6300 A/µs (T_{vj} = 150°C) T_{vj} = 125°C R_{Gon} = 1,0 Ω T_{vj} = 150°C	E_{on}		25,0 40,5 44,0		mJ mJ mJ
Abschaltverlustenergie pro Puls Turn-off energy loss per pulse	I_C = 450 A, V_{CE} = 600 V, L_S = 35 nH T_{vj} = 25°C V_{GE} = ±15 V, du/dt = 3100 V/µs (T_{vj} = 150°C) T_{vj} = 125°C R_{Goff} = 1,0 Ω T_{vj} = 150°C	E_{off}		37,0 56,5 63,0		mJ mJ mJ
Kurzschlußverhalten SC data	V_{GE} ≤ 15 V, V_{CC} = 800 V V_{CEmax} = V_{CES} -L_{sCE} ·di/dt t_P ≤ 10 µs, T_{vj} = 150°C	I_{SC}		1800		A
Wärmewiderstand, Chip bis Kühlkörper Thermal resistance, junction to heatsink	pro IGBT / per IGBT valid with IFX pre-applied thermal interface material	R_{thJH}			0,104	K/W
Temperatur im Schaltbetrieb Temperature under switching conditions		$T_{vj\,op}$	-40		150	°C

Diode, Wechselrichter / Diode, Inverter

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	450	A
Periodischer Spitzenstrom Repetitive peak forward current	t_P = 1 ms	I_{FRM}	900	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	30000 27500	A²s A²s

Charakteristische Werte / Characteristic Values

			min.	typ.	max.	
Durchlassspannung Forward voltage	I_F = 450 A, V_{GE} = 0 V, T_{vj} = 25°C I_F = 450 A, V_{GE} = 0 V, T_{vj} = 125°C I_F = 450 A, V_{GE} = 0 V, T_{vj} = 150°C	V_F		1,65 1,65 1,65	2,10	V V V
Rückstromspitze Peak reverse recovery current	I_F = 450 A, - di_F/dt = 6300 A/µs (T_{vj}=150°C), T_{vj} = 25°C V_R = 600 V, T_{vj} = 125°C V_{GE} = -15 V, T_{vj} = 150°C	I_{RM}		415 470 505		A A A
Sperrverzögerungsladung Recovered charge	I_F = 450 A, - di_F/dt = 6300 A/µs (T_{vj}=150°C), T_{vj} = 25°C V_R = 600 V, T_{vj} = 125°C V_{GE} = -15 V, T_{vj} = 150°C	Q_r		48,0 89,0 105		µC µC µC
Abschaltenergie pro Puls Reverse recovery energy	I_F = 450 A, - di_F/dt = 6300 A/µs (T_{vj}=150°C), T_{vj} = 25°C V_R = 600 V, T_{vj} = 125°C V_{GE} = -15 V, T_{vj} = 150°C	E_{rec}		22,5 39,5 45,5		mJ mJ mJ
Wärmewiderstand, Chip bis Kühlkörper Thermal resistance, junction to heatsink	pro Diode / per diode valid with IFX pre-applied thermal interface material	R_{thJH}			0,146	K/W
Temperatur im Schaltbetrieb Temperature under switching conditions		$T_{vj\,op}$	-40		150	°C

NTC-Widerstand / NTC-Thermistor

Charakteristische Werte / Characteristic Values

			min.	typ.	max.	
Nennwiderstand Rated resistance	T_{NTC} = 25°C	R_{25}		5,00		kΩ
Abweichung von R100 Deviation of R100	T_{NTC} = 100°C, R_{100} = 493 Ω	ΔR/R	-5		5	%
Verlustleistung Power dissipation	T_{NTC} = 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

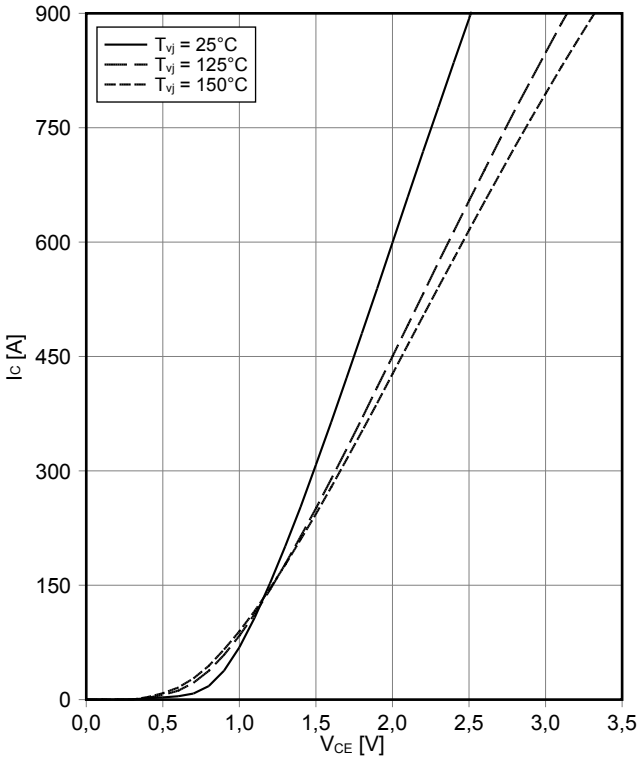
Angaben gemäß gültiger Application Note.
Specification according to the valid application note.

Modul / Module

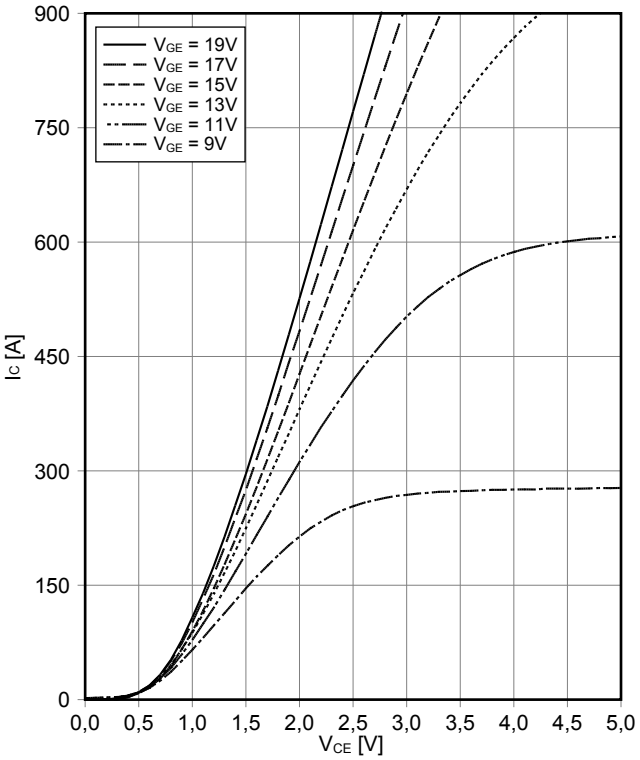
Isolations-Prüfspannung Isolation test voltage	RMS, f = 50 Hz, t = 1 min	V_{ISOL}		2,5		kV
Innere Isolation Internal isolation	Basisisolierung (Schutzklasse 1, EN61140) basic insulation (class 1, IEC 61140)			Al_2O_3		
Kriechstrecke Creepage distance	Kontakt - Kühlkörper / terminal to heatsink Kontakt - Kontakt / terminal to terminal			18,5 12,6		mm
Luftstrecke Clearance	Kontakt - Kühlkörper / terminal to heatsink Kontakt - Kontakt / terminal to terminal			16,0 10,0		mm
Vergleichszahl der Kriechwegbildung Comperative tracking index		CTI		> 200		
			min.	typ.	max.	
Modulstreuinduktivität Stray inductance module		L_{sCE}		20		nH
Modulleitungswiderstand, Anschlüsse - Chip Module lead resistance, terminals - chip	T_H = 25°C, pro Schalter / per switch	$R_{CC'+EE'}$		1,10		mΩ
Lagertemperatur Storage temperature		T_{stg}	-40		125	°C
Höchstzulässige Bodenplattenbetriebstemperatur Maximum baseplate operation temperature		T_{BPmax}			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		924		g

Lagerung und Transport von Modulen mit TIM => siehe AN 2012-07
Storage and shipment of modules with TIM => see AN 2012-07

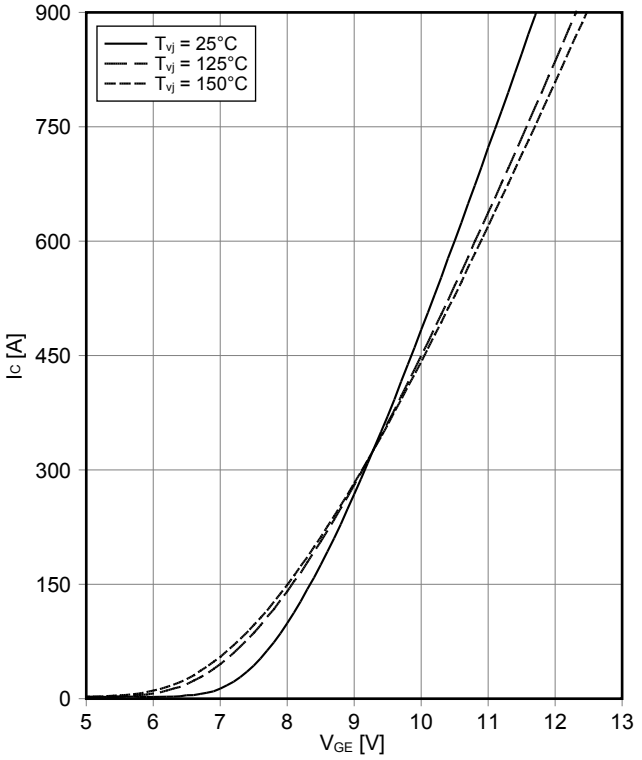
Ausgangskennlinie IGBT,Wechselrichter (typisch)
output characteristic IGBT,Inverter (typical)
$I_C = f(V_{CE})$
V_{GE} = 15 V



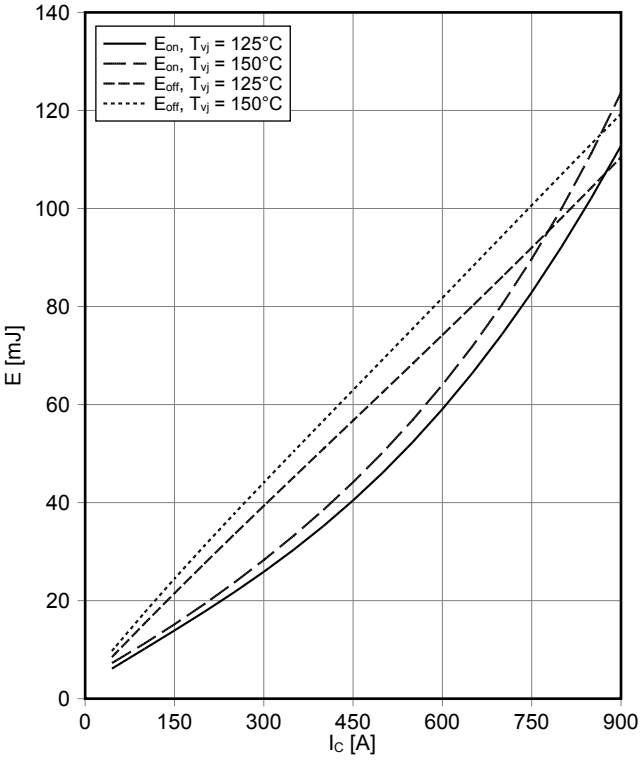
Ausgangskennlinienfeld IGBT,Wechselrichter (typisch)
output characteristic IGBT,Inverter (typical)
$I_C = f(V_{CE})$
T_{vj} = 150°C



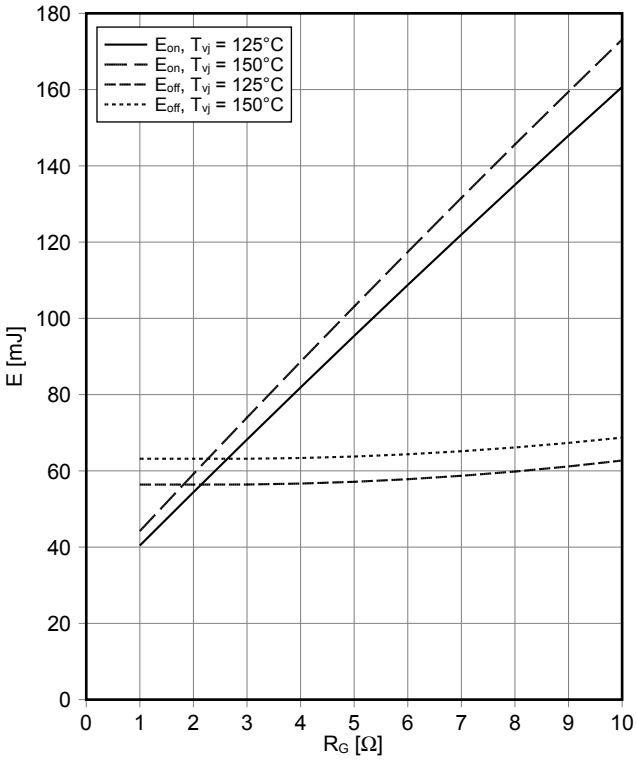
Übertragungscharakteristik IGBT,Wechselrichter (typisch)
transfer characteristic IGBT,Inverter (typical)
$I_C = f(V_{GE})$
V_{CE} = 20 V



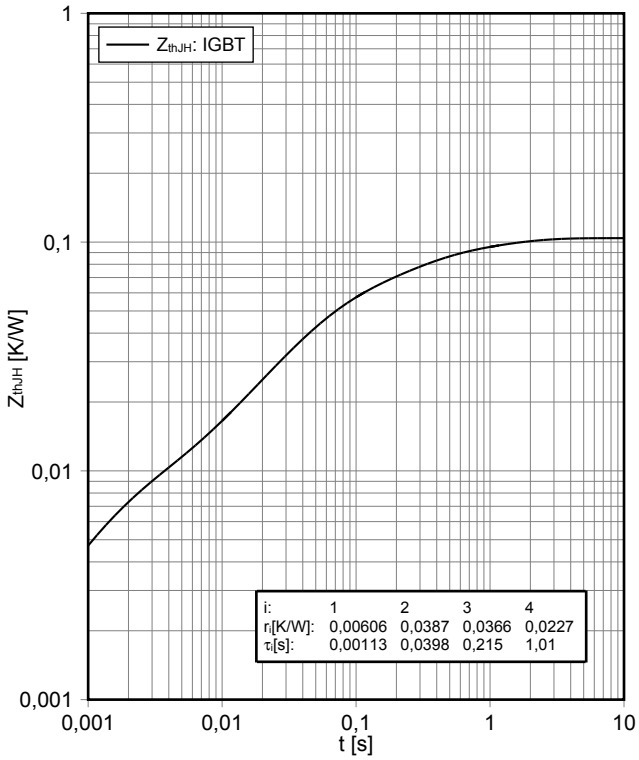
Schaltverluste IGBT,Wechselrichter (typisch)
switching losses IGBT,Inverter (typical)
$E_{on} = f(I_C)$, $E_{off} = f(I_C)$
V_{GE} = ±15 V, R_{Gon} = 1 Ω, R_{Goff} = 1 Ω, V_{CE} = 600 V



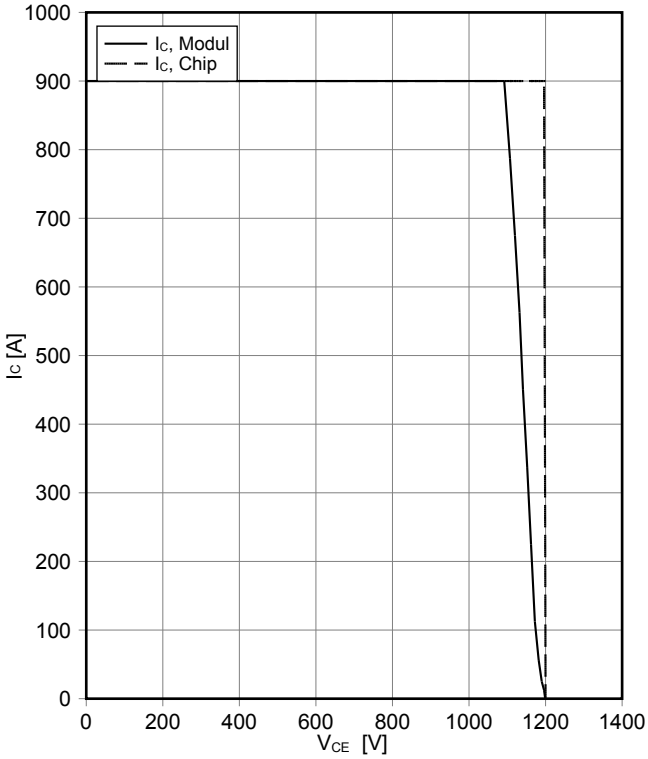
Schaltverluste IGBT,Wechselrichter (typisch)
switching losses IGBT,Inverter (typical)
$E_{on} = f(R_G)$, $E_{off} = f(R_G)$
V_{GE} = ±15 V, I_C = 450 A, V_{CE} = 600 V



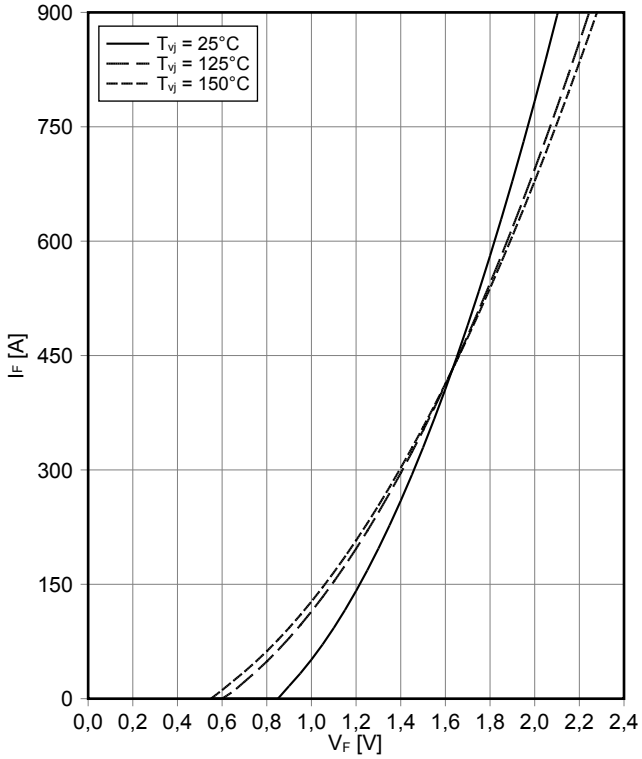
Transienter Wärmewiderstand IGBT,Wechselrichter
transient thermal impedance IGBT,Inverter
$Z_{thJH} = f(t)$



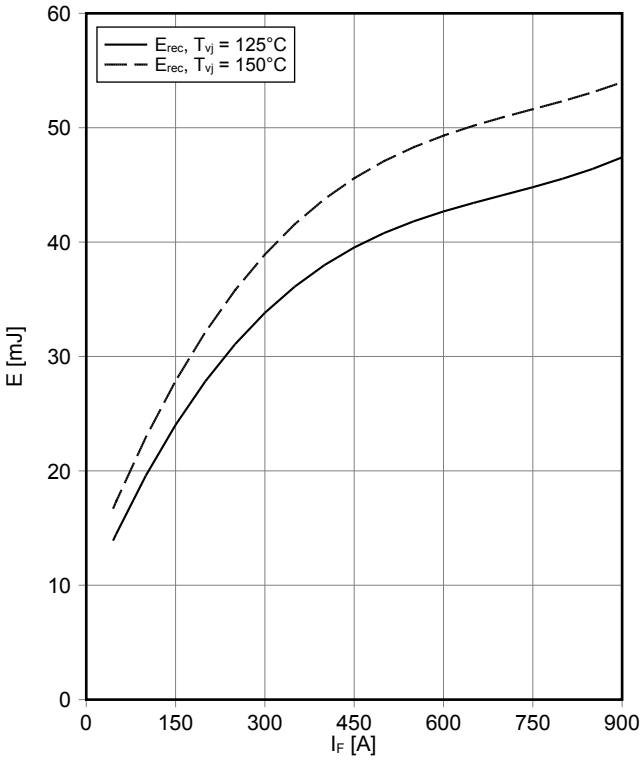
Sicherer Rückwärts-Arbeitsbereich IGBT,Wechselrichter (RBSOA)
reverse bias safe operating area IGBT,Inverter (RBSOA)
$I_C = f(V_{CE})$
V_{GE} = ±15 V, R_{Goff} = 1 Ω, T_{vj} = 150°C



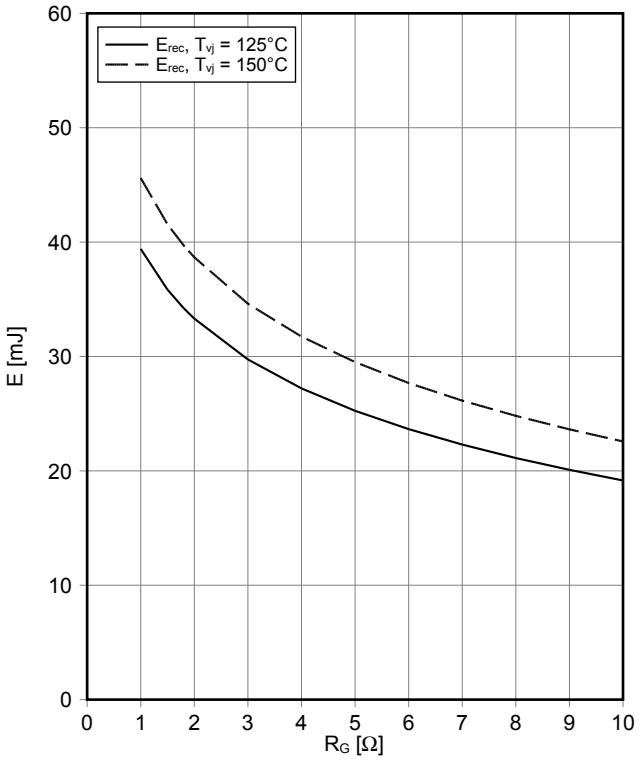
Durchlasskennlinie der Diode, Wechselrichter (typisch)
forward characteristic of Diode, Inverter (typical)
$I_F = f(V_F)$



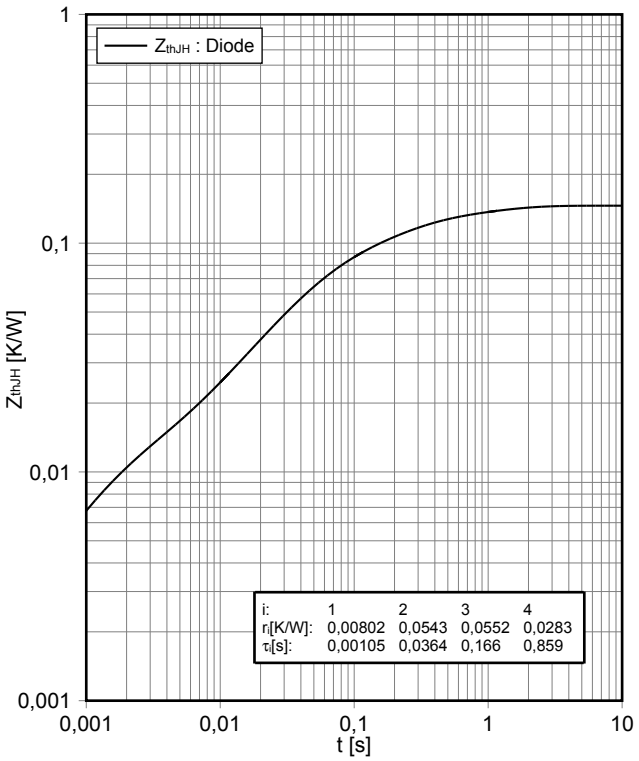
Schaltverluste Diode, Wechselrichter (typisch)
switching losses Diode, Inverter (typical)
$E_{rec} = f(I_F)$
$R_{Gon} = 1\ \Omega$, $V_{CE} = 600$ V



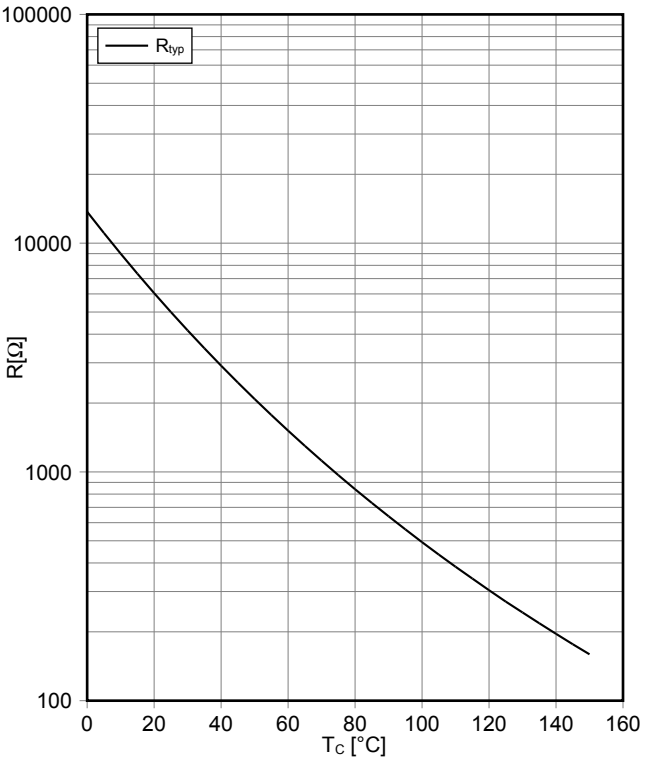
Schaltverluste Diode, Wechselrichter (typisch)
switching losses Diode, Inverter (typical)
$E_{rec} = f(R_G)$
$I_F = 450$ A, $V_{CE} = 600$ V



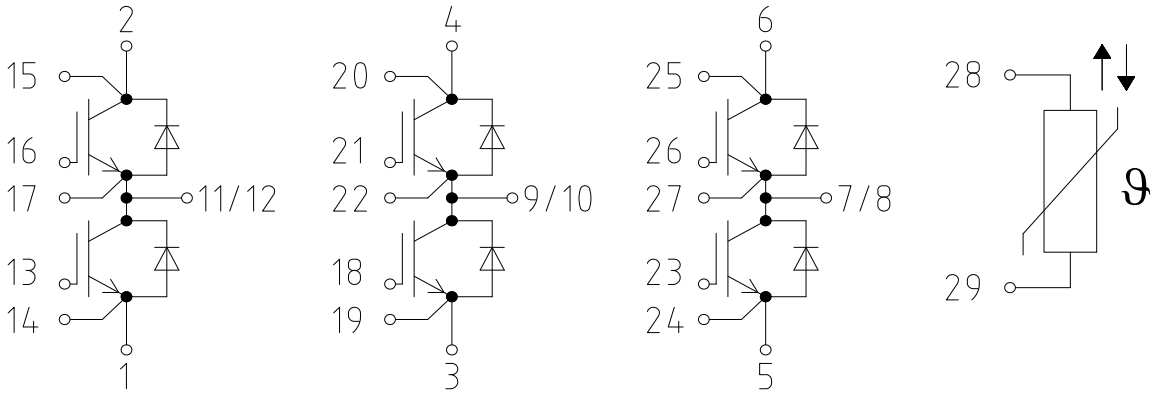
Transienter Wärmewiderstand Diode, Wechselrichter
transient thermal impedance Diode, Inverter
$Z_{thJH} = f(t)$



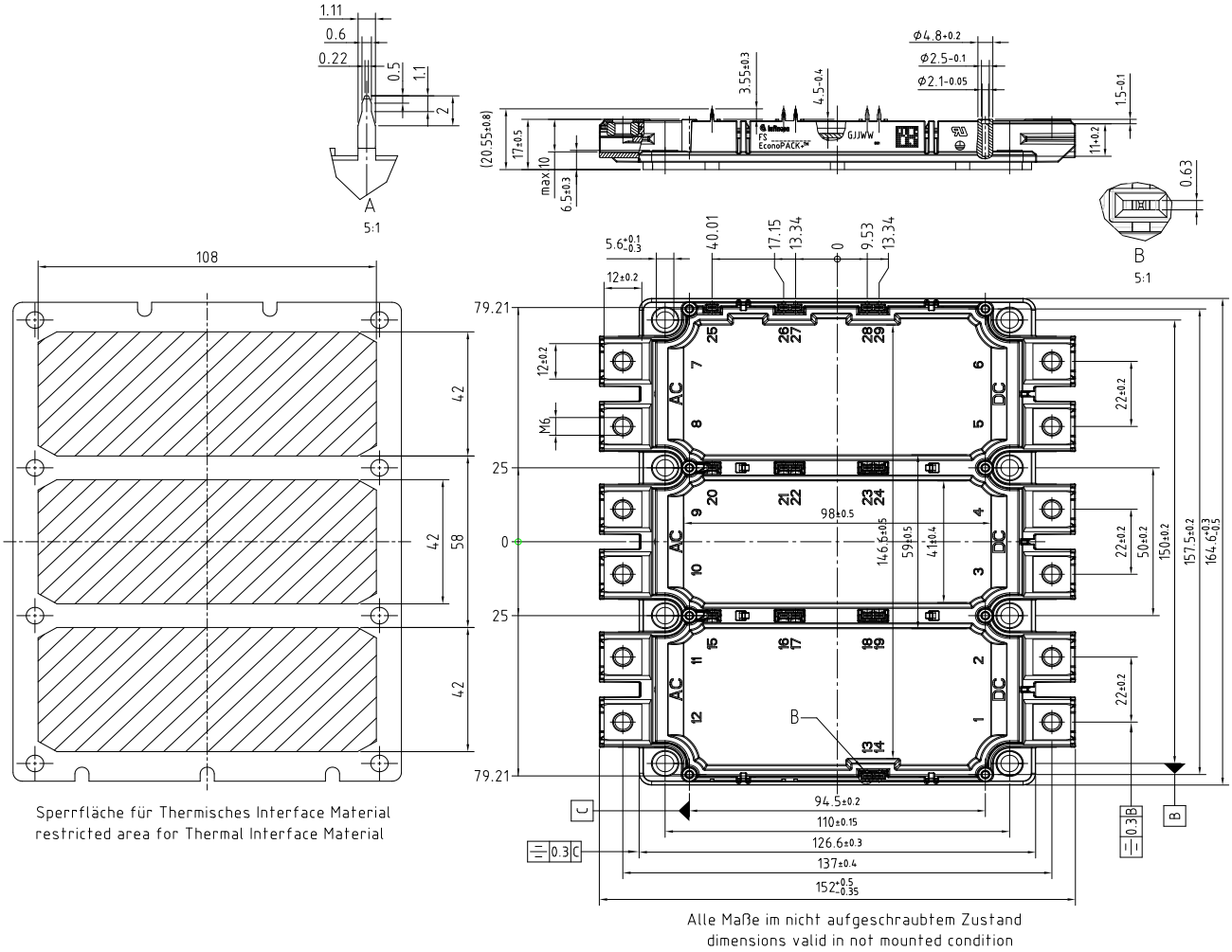
NTC-Widerstand-Temperaturkennlinie (typisch)
NTC-Thermistor-temperature characteristic (typical)
R = f (T)



Schaltplan / Circuit diagram



Gehäuseabmessungen / Package outlines



Sperrfläche für Thermisches Interface Material
restricted area for Thermal Interface Material

Alle Maße im nicht aufgeschraubtem Zustand
dimensions valid in not mounted condition

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Do you have a question about this document?
Email: erratum@infineon.com