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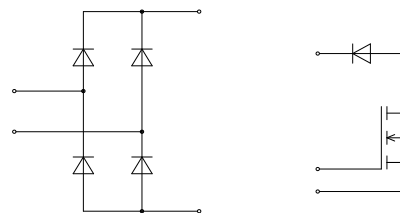
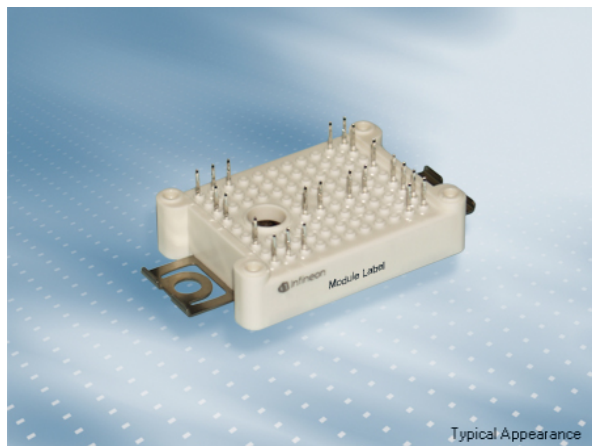
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EasyBRIDGE Modul mit CoolMOS und PressFIT
 EasyBRIDGE module with CoolMOS and PressFIT



$V_{DSS} = 600V$
 $I_{D\ nom} = 50A / I_{DRM} = 100A$

Typische Anwendungen

- Hilfsumrichter
- Induktives Erwärmen und Schweißen
- Klimaanlage
- Motorantriebe

Elektrische Eigenschaften

- CoolSiC (TM) Schottky Diode Gen 5
- Niedrige Schaltverluste

Mechanische Eigenschaften

- Al_2O_3 Substrat mit kleinem thermischen Widerstand
- Kompaktes Design
- PressFIT Verbindungstechnik
- Robuste Montage durch integrierte Befestigungsklammern

Typical Applications

- Auxiliary inverters
- Inductive heating and welding
- Air conditioning
- Motor drives

Electrical Features

- CoolSiC (TM) Schottky diode gen 5
- Low switching losses

Mechanical Features

- Al_2O_3 substrate with low thermal resistance
- Compact design
- PressFIT contact technology
- 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

Diode, Gleichrichter / Diode, Rectifier

Höchstzulässige Werte / Maximum Rated Values

Periodische Spitzensperrspannung Repetitive peak reverse voltage	$T_{vj} = 25^{\circ}\text{C}$	V_{RRM}	800	V
Durchlassstrom Grenzeffektivwert pro Chip Maximum RMS forward current per chip	$T_H = 40^{\circ}\text{C}$	I_{FRMSM}	50	A
Gleichrichter Ausgang Grenzeffektivstrom Maximum RMS current at rectifier output	$T_H = 40^{\circ}\text{C}$	I_{RMSM}	50	A
Stoßstrom Grenzwert Surge forward current	$t_p = 10\text{ ms}, T_{vj} = 25^{\circ}\text{C}$ $t_p = 10\text{ ms}, T_{vj} = 150^{\circ}\text{C}$	I_{FSM}	450 360	A A
Grenzlastintegral I^2t - value	$t_p = 10\text{ ms}, T_{vj} = 25^{\circ}\text{C}$ $t_p = 10\text{ ms}, T_{vj} = 150^{\circ}\text{C}$	I^2t	1000 650	A^2s A^2s

Charakteristische Werte / Characteristic Values

			min.	typ.	max.	
Durchlassspannung Forward voltage	$T_{vj} = 150^{\circ}\text{C}, I_F = 50\text{ A}$	V_F		1,10		V
Sperrstrom Reverse current	$T_{vj} = 150^{\circ}\text{C}, V_R = 800\text{ V}$	I_R		0,10		mA
Wärmewiderstand, Chip bis Kühlkörper Thermal resistance, junction to heatsink	pro Diode / per diode	R_{thJH}		1,90		K/W
Temperatur im Schaltbetrieb Temperature under switching conditions		$T_{vj\text{ op}}$	-40		150	$^{\circ}\text{C}$

Diode, Brems-Chopper / Diode, Brake-Chopper

Höchstzulässige Werte / Maximum Rated Values

Periodische Spitzensperrspannung Repetitive peak reverse voltage	$T_{vj} = 25^{\circ}\text{C}$	V_{RRM}	600	V
Dauergleichstrom Continuous DC forward current		I_F	40	A
Periodischer Spitzenstrom Repetitive peak forward current	$t_p = 1\text{ ms}$	I_{FRM}	80	A
Grenzlastintegral I^2t - value	$V_R = 0\text{ V}, t_p = 10\text{ ms}, T_{vj} = 125^{\circ}\text{C}$	I^2t	72,0	A^2s

Charakteristische Werte / Characteristic Values

			min.	typ.	max.	
Durchlassspannung Forward voltage	$I_F = 40\text{ A}, V_{GE} = 0\text{ V}$ $I_F = 40\text{ A}, V_{GE} = 0\text{ V}$ $I_F = 40\text{ A}, V_{GE} = 0\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	V_F	1,45 1,60 1,65	1,85	V V V
Rückstromspitze Peak reverse recovery current	$I_F = 40\text{ A}, -di_F/dt = 900\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 300\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	I_{RM}	10,0 11,0 11,0		A A A
Sperrverzögerungsladung Recovered charge	$I_F = 40\text{ A}, -di_F/dt = 900\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 300\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	Q_r	0,23 0,23 0,23		μC μC μC
Abschaltenergie pro Puls Reverse recovery energy	$I_F = 40\text{ A}, -di_F/dt = 900\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 300\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	E_{rec}	0,02 0,02 0,02		mJ mJ mJ
Wärmewiderstand, Chip bis Kühlkörper Thermal resistance, junction to heatsink	pro Diode / per diode	R_{thJH}		1,08		K/W
Temperatur im Schaltbetrieb Temperature under switching conditions		$T_{vj\text{ op}}$	-40		150	$^{\circ}\text{C}$

MOSFET / MOSFET

Höchstzulässige Werte / Maximum Rated Values

Drain-Source-Sperrspannung Drain-source breakdown voltage	$T_{vj} = 25^{\circ}\text{C}$	V_{DSS}	600	V
Drain-Gleichstrom DC drain current	$T_H = 45^{\circ}\text{C}$	$I_{D\text{ nom}}$	50	A
Gepulster Drainstrom, tp limitiert durch $T_{j\text{ max}}$ Pulsed drain current, tp limited by $T_{j\text{ max}}$		$I_{D\text{ puls}}$	100	A
Gate-Source-Spitzenspannung Gate-source peak voltage		V_{GSS}	+/-20	V

Charakteristische Werte / Characteristic Values

		min. typ. max.				
Einschaltwiderstand Drain-source on resistance	$I_D = 50\text{ A}, V_{GS} = 10\text{ V}, T_{vj} = 25^{\circ}\text{C}$	$R_{DS\text{ on}}$	20,0	33,0	m Ω	
Gate-Schwellenspannung Gate threshold voltage	$I_D = 6,00\text{ mA}, V_{DS} = V_{GS}, T_{vj} = 25^{\circ}\text{C}$	$V_{GS(th)}$	2,50	3,00	3,50	V
Gateladung Gate charge	$V_{GS} = 10\text{ V}, V_{DD} = 400\text{ V}$	Q_G	0,30		μC	
Interner Gatewiderstand Internal gate resistor	$T_{vj} = 25^{\circ}\text{C}$	R_{Gint}	2,7		Ω	
Eingangskapazität Input capacitance	$f = 1,00\text{ MHz}, T_{vj} = 25^{\circ}\text{C}, V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V}$	C_{iss}	14,0		nF	
Ausgangskapazität Output capacitance	$f = 1,00\text{ MHz}, T_{vj} = 25^{\circ}\text{C}, V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V}$	C_{oss}	0,64		nF	
Rückwirkungskapazität Reverse transfer capacitance	$f = 1,00\text{ MHz}, T_{vj} = 25^{\circ}\text{C}, V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V}$	C_{rss}	0,60		nF	
Drain-Source-Reststrom Zero gate voltage drain current	$V_{DS} = 600\text{ V}, V_{GS} = 0\text{ V}, T_{vj} = 25^{\circ}\text{C}$	I_{DSS}		200	μA	
Gate-Source-Reststrom Gate-source leakage current	$V_{DS} = 0\text{ V}, V_{GS} = 20\text{ V}, T_{vj} = 25^{\circ}\text{C}$	I_{GSS}		0,20	nA	
Einschaltverzögerungszeit, induktive Last Turn on delay time, inductive load	$I_D = 50\text{ A}, V_{DS} = 400\text{ V}$ $V_{GS} = 10\text{ V}$ $R_G = 10,0\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$t_{d\text{ on}}$	100 105	ns	
Anstiegszeit, induktive Last Rise time, inductive load	$I_D = 50\text{ A}, V_{DS} = 400\text{ V}$ $V_{GS} = 10\text{ V}$ $R_G = 10,0\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	t_r	45,0 45,0	ns	
Abschaltverzögerungszeit, induktive Last Turn off delay time, inductive load	$I_D = 50\text{ A}, V_{DS} = 400\text{ V}$ $V_{GS} = 10\text{ V}$ $R_G = 10,0\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$t_{d\text{ off}}$	325 325	ns	
Fallzeit, induktive Last Fall time, inductive load	$I_D = 50\text{ A}, V_{DS} = 400\text{ V}$ $V_{GS} = 10\text{ V}$ $R_G = 10,0\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	t_f	30,0 30,0	ns	
Einschaltverlustenergie pro Puls Turn-on energy loss per pulse	$I_D = 50\text{ A}, V_{DS} = 400\text{ V}, L\sigma = 40\text{ nH}$ $V_{GS} = 10\text{ V}$ $R_G = 10,0\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	E_{on}	0,45 0,45	mJ	
Abschaltverlustenergie pro Puls Turn-off energy loss per pulse	$I_D = 50\text{ A}, V_{DS} = 400\text{ V}, L\sigma = 40\text{ nH}$ $V_{GS} = 10\text{ V}$ $R_G = 10,0\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	E_{off}	0,30 0,30	mJ	
Wärmewiderstand, Chip bis Kühlkörper Thermal resistance, junction to heatsink	pro MOS-FET / per MOS-FET	R_{thJH}	0,450		K/W	
Temperatur im Schaltbetrieb Temperature under switching conditions		$T_{vj\text{ op}}$	-40	125	$^{\circ}\text{C}$	

Revers-Diode / reverse-diode

		min. typ. max.				
Durchlassspannung Forward voltage	$I_S = 70\text{ A}, V_{GS} = 0\text{ V}$ $I_S = 70\text{ A}, V_{GS} = 0\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	V_{SD}	0,90 1,10	1,20	V

Modul / Module

Isolations-Prüfspannung Isolation test voltage	RMS, f = 50 Hz, t = 1 min.	V _{ISOL}	2,5			kV
Innere Isolation Internal isolation	Basisisolation (Schutzklasse 1, EN61140) basic insulation (class 1, IEC 61140)		Al ₂ O ₃			
Kriechstrecke Creepage distance	Kontakt - Kühlkörper / terminal to heatsink Kontakt - Kontakt / terminal to terminal		11,5 6,3			mm
Luftstrecke Clearance	Kontakt - Kühlkörper / terminal to heatsink Kontakt - Kontakt / terminal to terminal		10,0 5,0			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'} R _{AA'+CC'}		6,00 4,00		mΩ
Lagertemperatur Storage temperature		T _{stg}	-40		125	°C
Anpresskraft für mech. Bef. pro Feder mounting force per clamp		F	20	-	50	N
Gewicht Weight		G		24		g

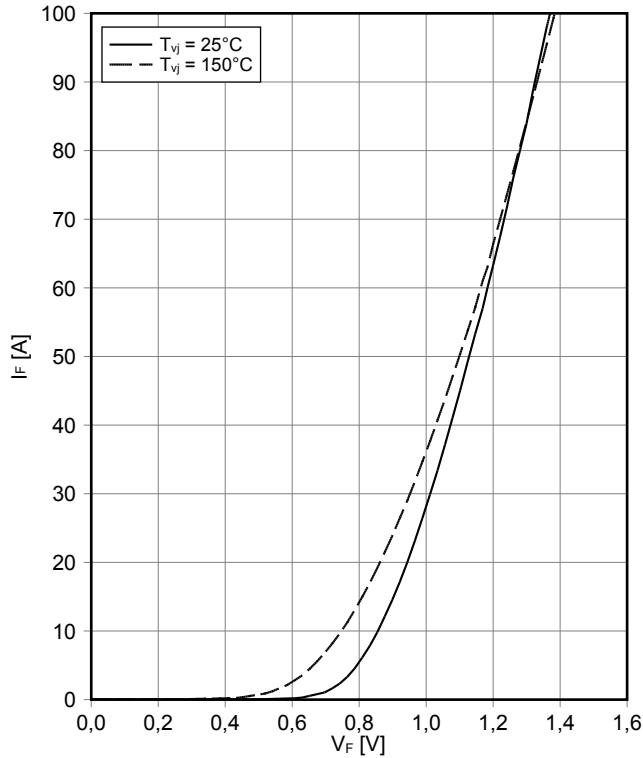
Der Strom im Dauerbetrieb ist auf 25 A effektiv pro Anschlusspin begrenzt

The current under continuous operation is limited to 25 A rms per connector pin

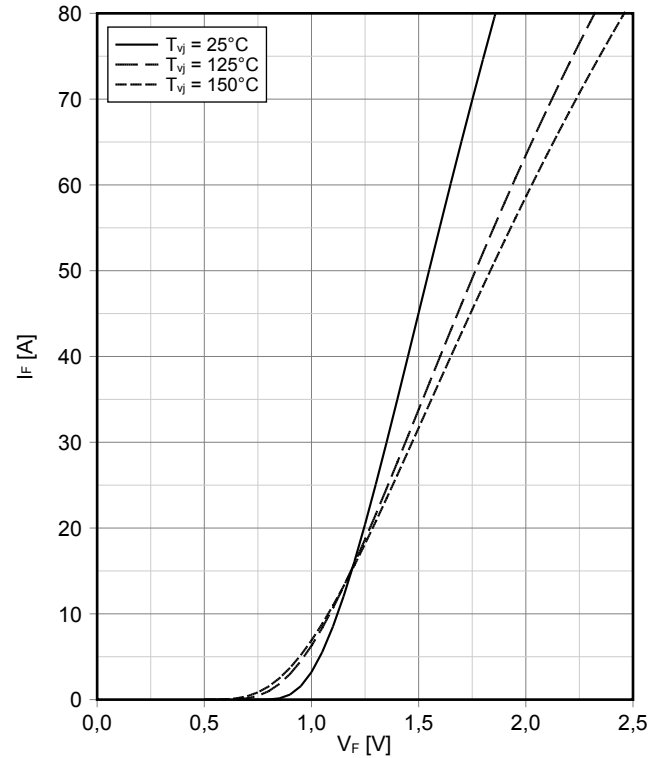
Designed for storage conditions according to Infineon TR14 (Application Note "Storage of Products Supplied by Infineon Technologies")

Designed for climate conditions without condensation or precipitation

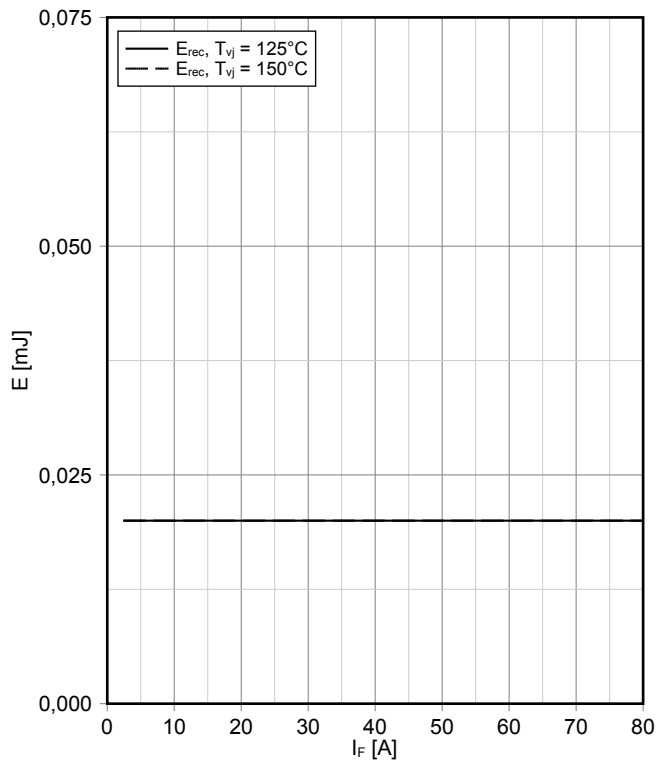
Durchlasskennlinie der Diode, Gleichrichter (typisch)
forward characteristic of Diode, Rectifier (typical)
 $I_F = f(V_F)$



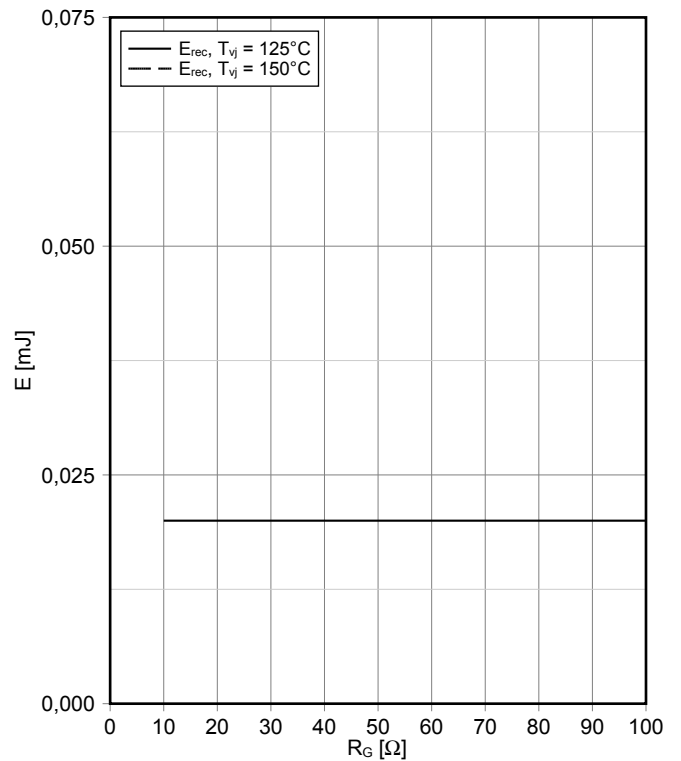
Durchlasskennlinie der Diode, Brems-Chopper (typisch)
forward characteristic of Diode, Brake-Chopper (typical)
 $I_F = f(V_F)$



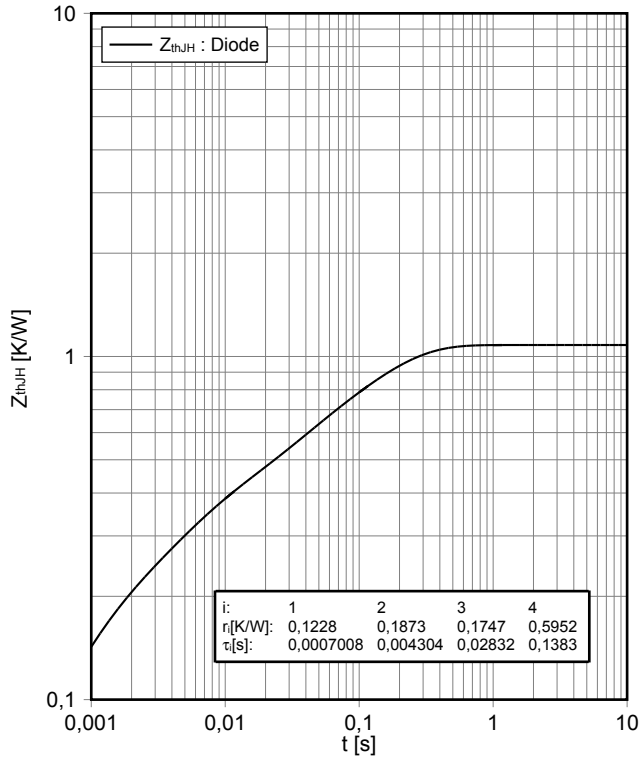
Schaltverluste Diode, Brems-Chopper (typisch)
switching losses Diode, Brake-Chopper (typical)
 $E_{rec} = f(I_F)$
 $R_{Gon} = 10 \Omega, V_{CE} = 300 V$



Schaltverluste Diode, Brems-Chopper (typisch)
switching losses Diode, Brake-Chopper (typical)
 $E_{rec} = f(R_G)$
 $I_F = 40 A, V_{CE} = 300 V$

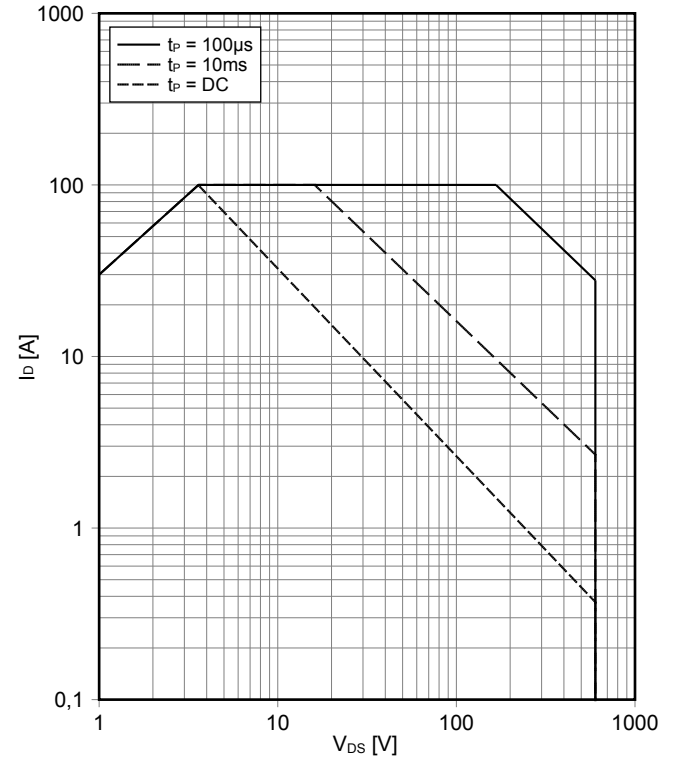


Transienter Wärmewiderstand Diode, Brems-Chopper
transient thermal impedance Diode, Brake-Chopper
 $Z_{thJH} = f(t)$

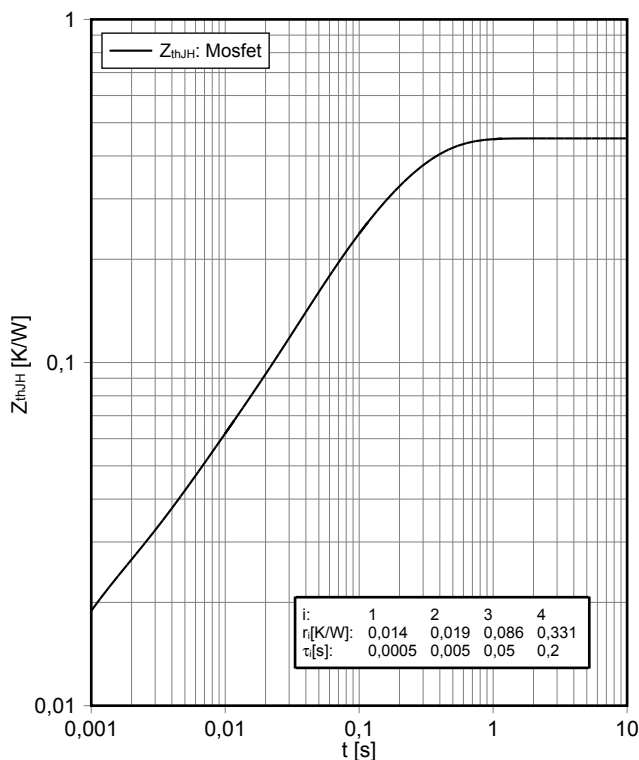


Sicherer Arbeitsbereich MOSFET (SOA)
safe operating area MOSFET (SOA)

$I_D = f(V_{DS})$
 $V_{GS} = \pm 10\text{ V}, T_H = 25^\circ\text{C}$

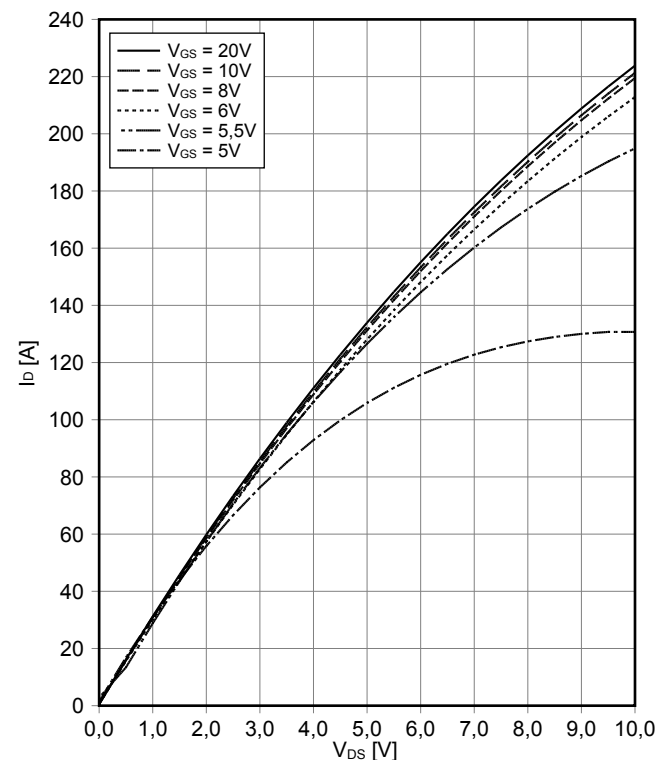


Transienter Wärmewiderstand MOSFET
transient thermal impedance MOSFET
 $Z_{thJH} = f(t)$



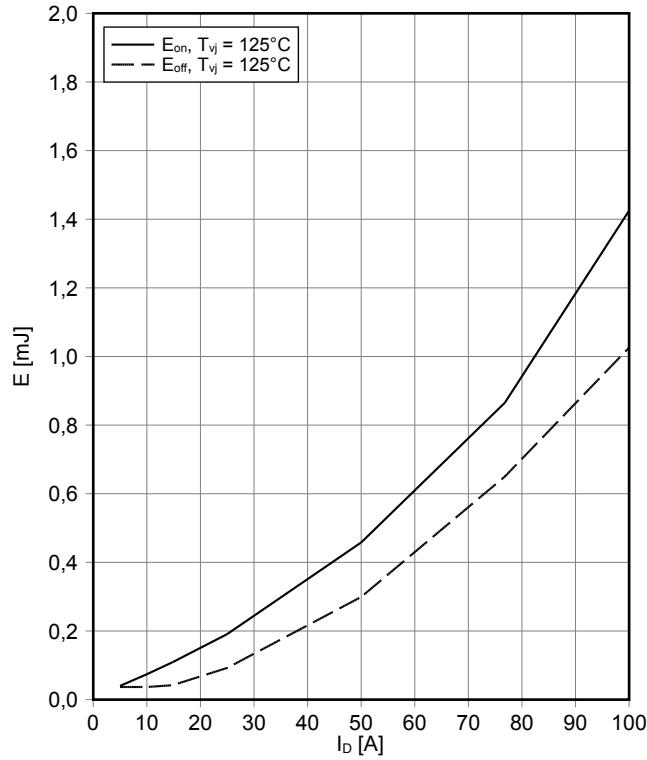
Ausgangskennlinie MOSFET (typisch)
output characteristic MOSFET (typical)

$I_D = f(V_{DS})$
 $T_{vj} = 125^\circ\text{C}$



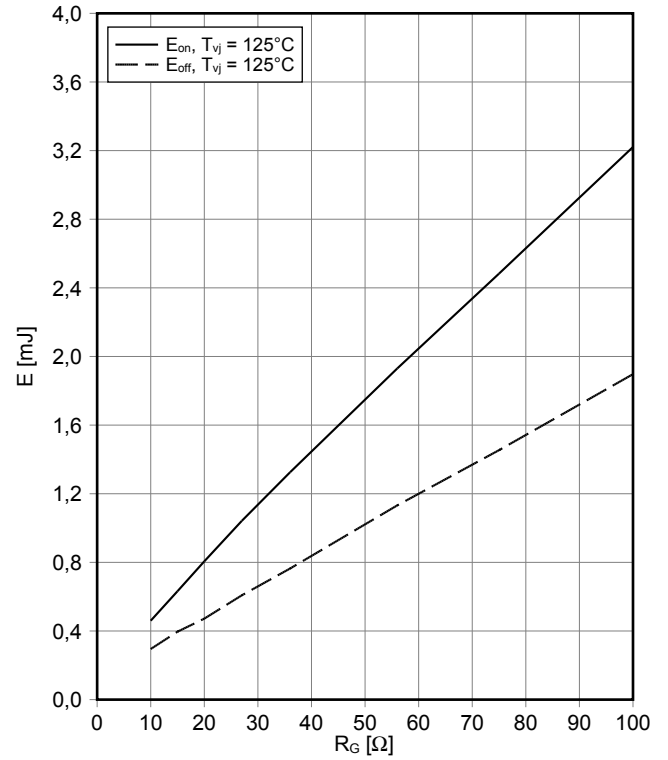
Schaltverluste MOSFET (typisch)
switching losses MOSFET (typical)

$E_{on} = f(I_D)$, $E_{off} = f(I_D)$
 $V_{GS} = \pm 10\text{ V}$, $R_{Gon} = 10\ \Omega$, $R_{Goff} = 10\ \Omega$, $V_{DS} = 400\text{ V}$

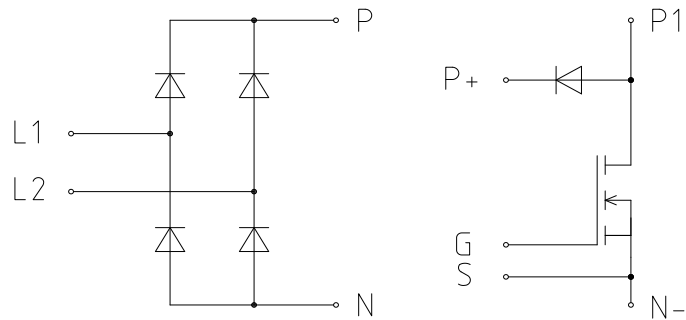


Schaltverluste MOSFET (typisch)
switching losses MOSFET (typical)

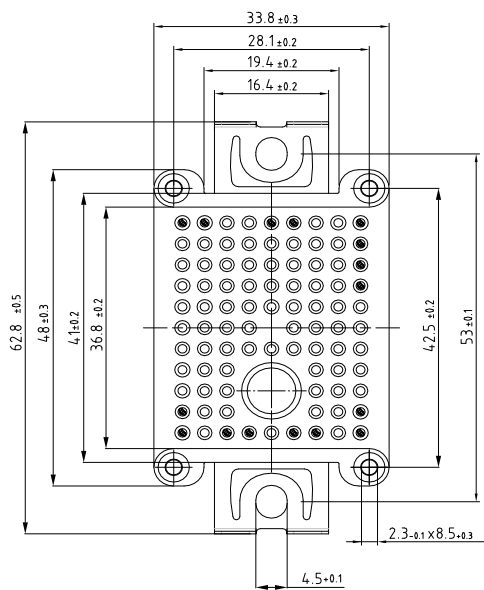
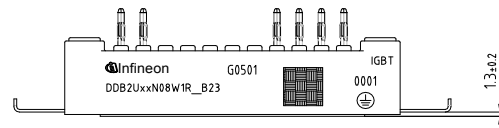
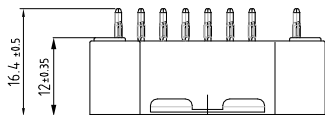
$E_{on} = f(R_G)$, $E_{off} = f(R_G)$
 $V_{GS} = \pm 10\text{ V}$, $I_D = 50\text{ A}$, $V_{DS} = 400\text{ V}$



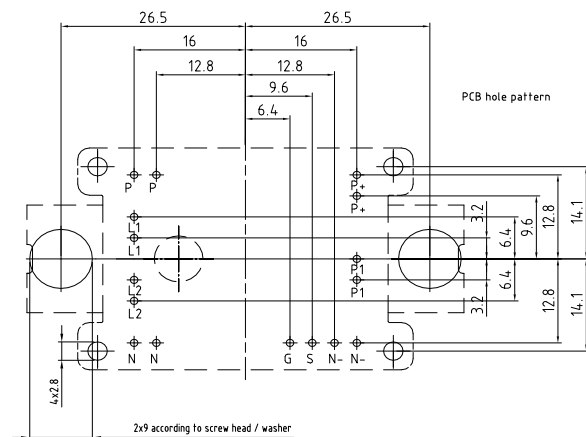
Schaltplan / Circuit diagram



Gehäuseabmessungen / Package outlines



- Pin-Grid 3.2mm
 - Tolerance of PCB hole pattern $\pm \phi 0.1$
 - Hole specification for contacts see AN 2009-01:
- Diameters of drill ϕ 1.15mm
and copper thickness in hole 25-50 μ m



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