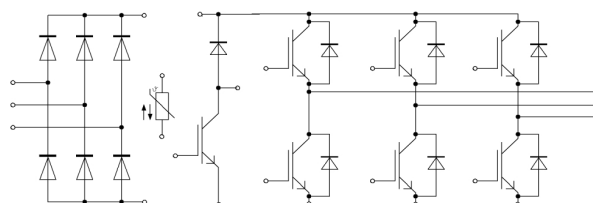
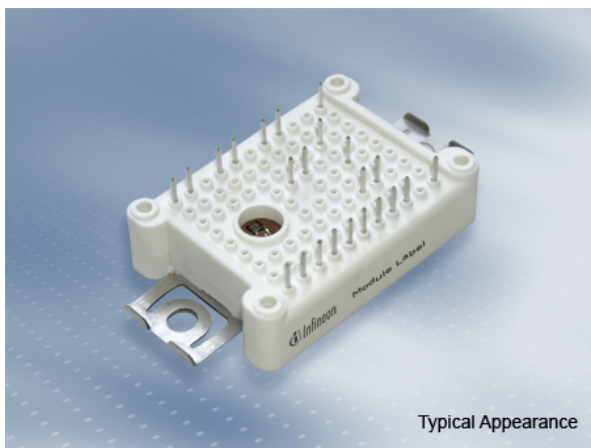


EasyPIM™ Modul mit Trench/Feldstopp IGBT4 und Emitter Controlled 4 Diode und NTC  
EasyPIM™ module with Trench/Fieldstop IGBT4 and Emitter Controlled 4 diode and NTC

**Vorläufige Daten / Preliminary Data**



$V_{CES} = 1200V$   
 $I_{C\ nom} = 15A / I_{CRM} = 30A$

**Typische Anwendungen**

- Hilfsumrichter
- Klimaanlage
- Motorantriebe

**Typical Applications**

- Auxiliary Inverters
- Air Conditioning
- Motor Drives

**Elektrische Eigenschaften**

- Niedrige Schaltverluste
- Trench IGBT 4
- $V_{CEsat}$  mit positivem Temperaturkoeffizienten
- Niedriges  $V_{CEsat}$

**Electrical Features**

- Low Switching Losses
- Trench IGBT 4
- $V_{CEsat}$  with positive Temperature Coefficient
- Low  $V_{CEsat}$

**Mechanische Eigenschaften**

- $Al_2O_3$  Substrat mit kleinem thermischen Widerstand
- Kompaktes Design
- Lötverbindungstechnik
- Robuste Montage durch integrierte Befestigungsklammern

**Mechanical Features**

- $Al_2O_3$  Substrate with Low Thermal Resistance
- Compact design
- Solder 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

prepared by: DK	date of publication: 2013-10-03	
approved by: MB	revision: 2.2	UL approved (E83335)



**Vorläufige Daten  
Preliminary Data**

**IGBT, Wechselrichter / IGBT, Inverter  
Höchstzulässige Werte / Maximum Rated Values**

Kollektor-Emitter-Sperrspannung Collector-emitter voltage	$T_{vj} = 25^{\circ}\text{C}$	$V_{CES}$	1200	V
Kollektor-Dauergleichstrom Continuous DC collector current	$T_C = 100^{\circ}\text{C}, T_{vj\text{max}} = 175^{\circ}\text{C}$ $T_C = 25^{\circ}\text{C}, T_{vj\text{max}} = 175^{\circ}\text{C}$	$I_{C\text{nom}}$ $I_C$	15 28	A A
Periodischer Kollektor-Spitzenstrom Repetitive peak collector current	$t_P = 1\text{ ms}$	$I_{CRM}$	30	A
Gesamt-Verlustleistung Total power dissipation	$T_C = 25^{\circ}\text{C}, T_{vj\text{max}} = 175$	$P_{tot}$	130	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	$I_C = 15\text{ A}, V_{GE} = 15\text{ V}$ $I_C = 15\text{ A}, V_{GE} = 15\text{ V}$ $I_C = 15\text{ A}, V_{GE} = 15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$V_{CE\text{sat}}$	1,85 2,15 2,25	2,25	V V V	
Gate-Schwellenspannung Gate threshold voltage	$I_C = 0,48\text{ mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$		$V_{GEth}$	5,2	5,8	6,4	V
Gateladung Gate charge	$V_{GE} = -15\text{ V} \dots +15\text{ V}$		$Q_G$	0,12			$\mu\text{C}$
Interner Gatewiderstand Internal gate resistor	$T_{vj} = 25^{\circ}\text{C}$		$R_{Gint}$	0,0			$\Omega$
Eingangskapazität Input capacitance	$f = 1\text{ MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}$		$C_{ies}$	0,89			nF
Rückwirkungskapazität Reverse transfer capacitance	$f = 1\text{ MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}$		$C_{res}$	0,03			nF
Kollektor-Emitter-Reststrom Collector-emitter cut-off current	$V_{CE} = 1200\text{ V}, V_{GE} = 0\text{ V}, T_{vj} = 25^{\circ}\text{C}$		$I_{CES}$			1,0	mA
Gate-Emitter-Reststrom Gate-emitter leakage current	$V_{CE} = 0\text{ V}, V_{GE} = 20\text{ V}, T_{vj} = 25^{\circ}\text{C}$		$I_{GES}$			400	nA
Einschaltverzögerungszeit, induktive Last Turn-on delay time, inductive load	$I_C = 15\text{ A}, V_{CE} = 600\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $R_{Gon} = 39\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_{don}$	0,055 0,055 0,055			$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
Anstiegszeit, induktive Last Rise time, inductive load	$I_C = 15\text{ A}, V_{CE} = 600\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $R_{Gon} = 39\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_r$	0,059 0,065 0,065			$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
Abschaltverzögerungszeit, induktive Last Turn-off delay time, inductive load	$I_C = 15\text{ A}, V_{CE} = 600\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $R_{Goff} = 39\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_{doff}$	0,195 0,275 0,28			$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
Fallzeit, induktive Last Fall time, inductive load	$I_C = 15\text{ A}, V_{CE} = 600\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $R_{Goff} = 39\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_f$	0,145 0,19 0,215			$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
Einschaltverlustenergie pro Puls Turn-on energy loss per pulse	$I_C = 15\text{ A}, V_{CE} = 600\text{ V}, L_S = 50\text{ nH}$ $V_{GE} = \pm 15\text{ V}, di/dt = 550\text{ A}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$ $R_{Gon} = 39\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$E_{on}$	1,30 1,75 1,95			mJ mJ mJ
Abschaltverlustenergie pro Puls Turn-off energy loss per pulse	$I_C = 15\text{ A}, V_{CE} = 600\text{ V}, L_S = 50\text{ nH}$ $V_{GE} = \pm 15\text{ V}, du/dt = 3500\text{ V}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$ $R_{Goff} = 39\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$E_{off}$	0,83 1,20 1,35			mJ mJ mJ
Kurzschlußverhalten SC data	$V_{GE} \leq 15\text{ V}, V_{CC} = 800\text{ V}$ $V_{CEmax} = V_{CES} - L_{SCE} \cdot di/dt$ $t_P \leq 10\ \mu\text{s}, T_{vj} = 150^{\circ}\text{C}$		$I_{SC}$	55			A
Wärmewiderstand, Chip bis Gehäuse Thermal resistance, junction to case	pro IGBT / per IGBT		$R_{thJC}$	1,05	1,15		K/W
Wärmewiderstand, Gehäuse bis Kühlkörper Thermal resistance, case to heatsink	pro IGBT / per IGBT $\lambda_{Paste} = 1\text{ W}/(\text{m}\cdot\text{K})$ / $\lambda_{grease} = 1\text{ W}/(\text{m}\cdot\text{K})$		$R_{thCH}$	1,05			K/W
Temperatur im Schaltbetrieb Temperature under switching conditions			$T_{vj\text{op}}$	-40	150		$^{\circ}\text{C}$

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