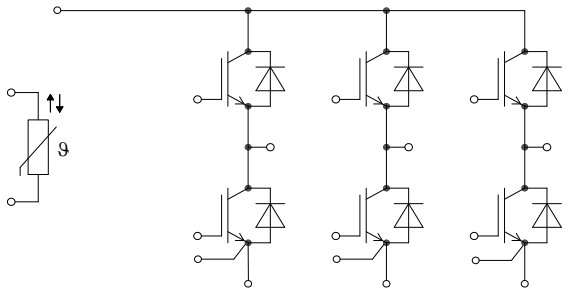
Technische Information / Technical Information

IGBT-Modul
IGBT-Module

FS50R12U1T4

SmartPACK1 Modul mit Trench/Feldstopp IGBT4 und Emitter Controlled 4 Diode und PressFIT / NTC
SmartPACK1 module with Trench/Fieldstop IGBT4 and Emitter Controlled 4 diode and PressFIT / NTC



V_{CES} = 1200V
$I_{C\ nom}$ = 50A / I_{CRM} = 100A

Typische Anwendungen
- Klimaanlagen
- Motorantriebe
- Servoumrichter
- USV-Systeme

Typical Applications
- Air Conditioning
- Motor Drives
- Servo Drives
- UPS Systems

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

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

Mechanische Eigenschaften
- Al_2O_3 Substrat mit kleinem thermischen Widerstand
- Kompaktes Design
- PressFIT Verbindungstechnik
- Robuste Duplex-Rahmen Konstruktion

Mechanical Features
- Al_2O_3 Substrate with Low Thermal Resistance
- Compact design
- PressFIT Contact Technology
- Rugged Duplex frame construction

Module Label Code

Barcode Code 128

Sample
00000123456000000000000

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

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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_C = 90°C, $T_{vj\,max}$ = 175°C T_C = 25°C, $T_{vj\,max}$ = 175°C	$I_{C\,nom}$ I_C	50 90	A A
Periodischer Kollektor-Spitzenstrom Repetitive peak collector current	t_P = 1 ms	I_{CRM}	100	A
Gesamt-Verlustleistung Total power dissipation	T_C = 25°C, $T_{vj\,max}$ = 175°C	P_{tot}	250	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 = 50 A, V_{GE} = 15 V I_C = 50 A, V_{GE} = 15 V I_C = 50 A, V_{GE} = 15 V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	$V_{CE\,sat}$		1,85 2,15 2,25	2,15	V V V
Gate-Schwellenspannung Gate threshold voltage	I_C = 1,60 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		0,38		µC
Interner Gatewiderstand Internal gate resistor	T_{vj} = 25°C		R_{Gint}		4,0		Ω
Eingangskapazität Input capacitance	f = 1 MHz, T_{vj} = 25°C, V_{CE} = 25 V, V_{GE} = 0 V		C_{ies}		2,80		nF
Rückwirkungskapazität Reverse transfer capacitance	f = 1 MHz, T_{vj} = 25°C, V_{CE} = 25 V, V_{GE} = 0 V		C_{res}		0,10		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 = 50 A, V_{CE} = 600 V V_{GE} = ±15 V R_{Gon} = 15 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	$t_{d\,on}$		0,045 0,05 0,05		µs µs µs
Anstiegszeit, induktive Last Rise time, inductive load	I_C = 50 A, V_{CE} = 600 V V_{GE} = ±15 V R_{Gon} = 15 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	t_r		0,027 0,035 0,045		µs µs µs
Abschaltverzögerungszeit, induktive Last Turn-off delay time, inductive load	I_C = 50 A, V_{CE} = 600 V V_{GE} = ±15 V R_{Goff} = 15 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	$t_{d\,off}$		0,27 0,37 0,40		µs µs µs
Fallzeit, induktive Last Fall time, inductive load	I_C = 50 A, V_{CE} = 600 V V_{GE} = ±15 V R_{Goff} = 15 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	t_f		0,11 0,18 0,19		µs µs µs
Einschaltverlustenergie pro Puls Turn-on energy loss per pulse	I_C = 50 A, V_{CE} = 600 V, L_S = 35 nH V_{GE} = ±15 V, di/dt = 1500 A/µs (T_{vj} = 150°C) R_{Gon} = 15 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	E_{on}		4,20 5,50 6,20		mJ mJ mJ
Abschaltverlustenergie pro Puls Turn-off energy loss per pulse	I_C = 50 A, V_{CE} = 600 V, L_S = 35 nH V_{GE} = ±15 V, du/dt = 3800 V/µs (T_{vj} = 150°C) R_{Goff} = 15 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	E_{off}		2,90 4,20 4,60		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}		180		A
Wärmewiderstand, Chip bis Gehäuse Thermal resistance, junction to case	pro IGBT / per IGBT		R_{thJC}		0,50	0,60	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}		0,40		K/W
Temperatur im Schaltbetrieb Temperature under switching conditions			$T_{vj\,op}$	-40		150	°C

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