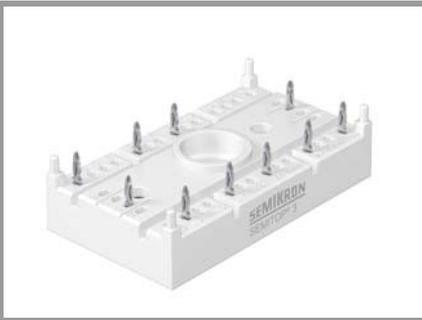


SK 25 GD 12T4 ETp



SEMITOP® 3 Press-Fit

Sixpack Open Emitter

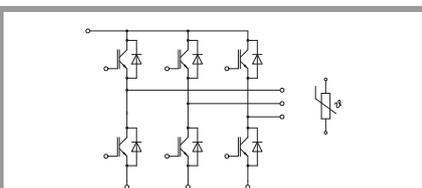
SK 25 GD 12T4 ETp

Features*

- One screw mounting module
- Optimized design for superior thermal performances
- Low inductive design
- Compatible with other SEMITOP® Press-Fit types
- 1200V Trench IGBT (T4)
- Robust and soft switching CAL4F diode technology
- Integrated NTC temperature sensor
- UL recognized, file no. E 63 532

Typical Applications

- Motor Drives
- Servo Drives
- Air Conditioning
- Auxiliary Inverters
- UPS



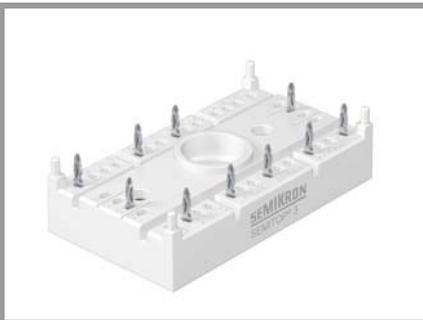
GD-ET

Absolute Maximum Ratings			
Symbol	Conditions	Values	Unit
IGBT 1			
V_{CES}	$T_j = 25\text{ °C}$	1200	V
I_C	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$	32
		$T_s = 70\text{ °C}$	24
I_C	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	35
		$T_s = 70\text{ °C}$	29
I_{Chom}		25	A
I_{CRM}		75	A
V_{GES}		-20 ... 20	V
t_{psc}	$V_{CC} = 800\text{ V}$ $V_{GE} \leq 15\text{ V}$ $V_{CES} \leq 1200\text{ V}$	$T_j = 150\text{ °C}$	10
T_j		-40 ... 175	°C

Absolute Maximum Ratings			
Symbol	Conditions	Values	Unit
Diode 1			
V_{RRM}	$T_j = 25\text{ °C}$	1200	V
I_F	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$	25
		$T_s = 70\text{ °C}$	19
I_F	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	28
		$T_s = 70\text{ °C}$	22
I_{FRM}		50	A
I_{FSM}	10 ms, sin 180°, $T_j = 150\text{ °C}$	100	A
T_j		-40 ... 175	°C

Absolute Maximum Ratings			
Symbol	Conditions	Values	Unit
Module			
$I_{t(RMS)}$	$\Delta T_{terminal}$ at PCB joint = 30 K, per pin	35	A
T_{stg}	module without TIM	-40 ... 125	°C
V_{isol}	AC, sinusoidal, $t = 1\text{ min}$	2500	V

SK 25 GD 12T4 ETp



SEMITOP® 3 Press-Fit

Sixpack Open Emitter

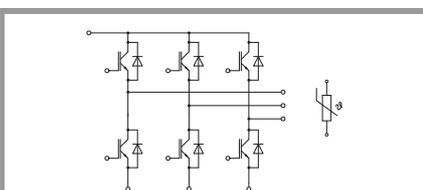
SK 25 GD 12T4 ETp

Features*

- One screw mounting module
- Optimized design for superior thermal performances
- Low inductive design
- Compatible with other SEMITOP® Press-Fit types
- 1200V Trench IGBT (T4)
- Robust and soft switching CAL4F diode technology
- Integrated NTC temperature sensor
- UL recognized, file no. E 63 532

Typical Applications

- Motor Drives
- Servo Drives
- Air Conditioning
- Auxiliary Inverters
- UPS

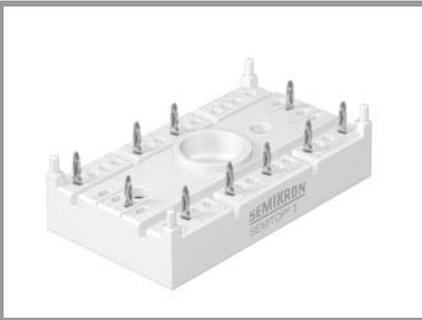


GD-ET

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
IGBT 1						
$V_{CE(sat)}$	$I_C = 25\text{ A}$ $V_{GE} = 15\text{ V}$ chipelevel	$T_j = 25\text{ °C}$	1.85	2.10		V
		$T_j = 150\text{ °C}$	2.25	2.45		V
V_{CE0}	chipelevel	$T_j = 25\text{ °C}$	0.80	0.90		V
		$T_j = 150\text{ °C}$	0.70	0.80		V
r_{CE}	$V_{GE} = 15\text{ V}$ chipelevel	$T_j = 25\text{ °C}$	42	48		mΩ
		$T_j = 150\text{ °C}$	62	66		mΩ
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 0.85\text{ mA}$		5.3	5.8	6.3	V
I_{CES}	$V_{GE} = 0\text{ V}$ $V_{CE} = 1200\text{ V}$	$T_j = 25\text{ °C}$			1	mA
					-	mA
C_{ies}	$V_{CE} = 25\text{ V}$ $V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$		1.45		nF
C_{oes}		$f = 1\text{ MHz}$		0.12		nF
C_{res}		$f = 1\text{ MHz}$		0.05		nF
Q_G	$V_{GE} = -7V...+15V$			142		nC
R_{Gint}	$T_j = 25\text{ °C}$			0		Ω
$t_{d(on)}$	$V_{CC} = 600\text{ V}$	$T_j = 150\text{ °C}$		22		ns
t_r	$I_C = 25\text{ A}$ $V_{GE\ neg} = -7\text{ V}$	$T_j = 150\text{ °C}$		19.5		ns
		$T_j = 150\text{ °C}$		2.27		mJ
E_{on}	$V_{GE\ pos} = 15\text{ V}$	$T_j = 150\text{ °C}$		2.27		mJ
$t_{d(off)}$	$R_{G\ on} = 19\text{ Ω}$	$T_j = 150\text{ °C}$		288		ns
t_f	$R_{G\ off} = 19\text{ Ω}$	$T_j = 150\text{ °C}$		77.5		ns
E_{off}	$di/dt_{on} = 2825\text{ A/μs}$ $di/dt_{off} = 1685\text{ A/μs}$	$T_j = 150\text{ °C}$		2.7		mJ
$R_{th(j-s)}$	per IGBT, $\lambda_{paste}=0.8\text{ W/(mK)}$			1.31		K/W

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Diode 1						
V_F	$I_F = 25\text{ A}$ chipelevel	$T_j = 25\text{ °C}$	2.41	2.74		V
		$T_j = 150\text{ °C}$	2.45	2.79		V
V_{F0}	chipelevel	$T_j = 25\text{ °C}$	1.30	1.50		V
		$T_j = 150\text{ °C}$	0.90	1.10		V
r_F	chipelevel	$T_j = 25\text{ °C}$	44	50		mΩ
		$T_j = 150\text{ °C}$	62	68		mΩ
I_{RRM}	$I_F = 25\text{ A}$	$T_j = 150\text{ °C}$		31.5		A
Q_{rr}	$di/dt_{off} = 2825\text{ A/μs}$	$T_j = 150\text{ °C}$		1.15		μC
E_{rr}	$V_{GE} = -7\text{ V}$ $V_{CC} = 600\text{ V}$	$T_j = 150\text{ °C}$		1.28		mJ
$R_{th(j-s)}$	per diode, $\lambda_{paste}=0.8\text{ W/(mK)}$			1.91		K/W

SK 25 GD 12T4 ETp



SEMITOP® 3 Press-Fit

Sixpack Open Emitter

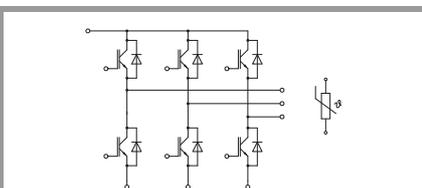
SK 25 GD 12T4 ETp

Features*

- One screw mounting module
- Optimized design for superior thermal performances
- Low inductive design
- Compatible with other SEMITOP® Press-Fit types
- 1200V Trench IGBT (T4)
- Robust and soft switching CAL4F diode technology
- Integrated NTC temperature sensor
- UL recognized, file no. E 63 532

Typical Applications

- Motor Drives
- Servo Drives
- Air Conditioning
- Auxiliary Inverters
- UPS



GD-ET

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
Module					
M _s	to heatsink	2.25		2.5	Nm
w	weight		30		g

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
Temperature Sensor					
R ₁₀₀	T _r = 100 °C		493 ± 5%		Ω
B _{100/125}	R _(T) = R ₁₀₀ exp[B _{100/125} (1/T - 1/T ₁₀₀)]; T[K];		3550 ±2%		K

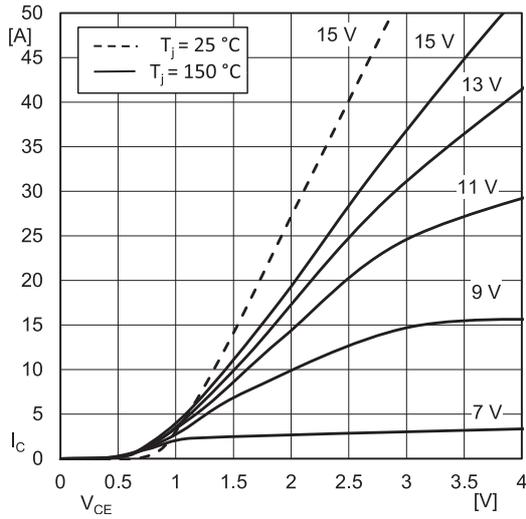


Fig. 1: Typ. IGBT1 output characteristic, incl. $R_{CC'+EE'}$

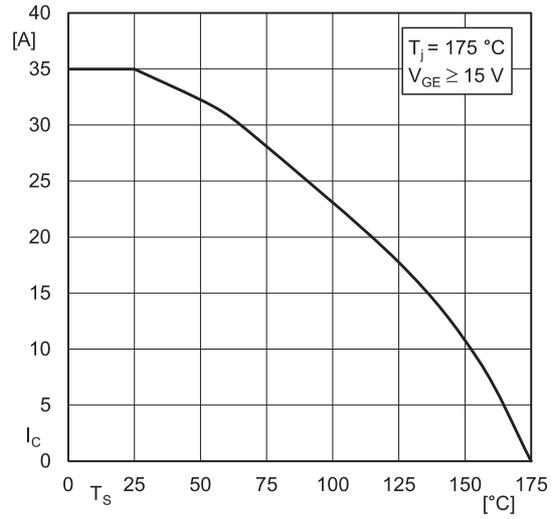


Fig. 2: Typ. rated current vs. temperature $I_C = f(T_s)$

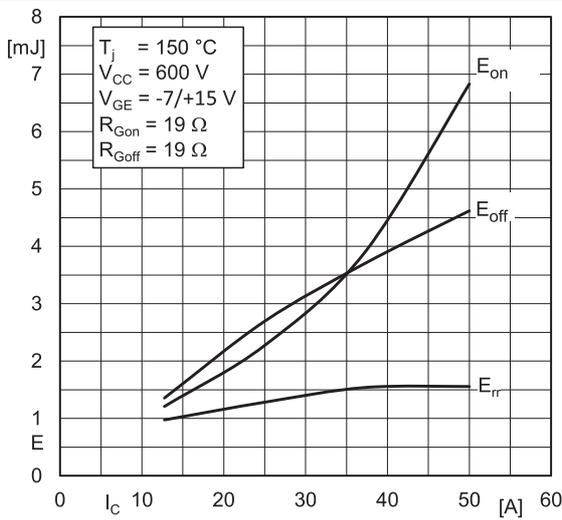


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

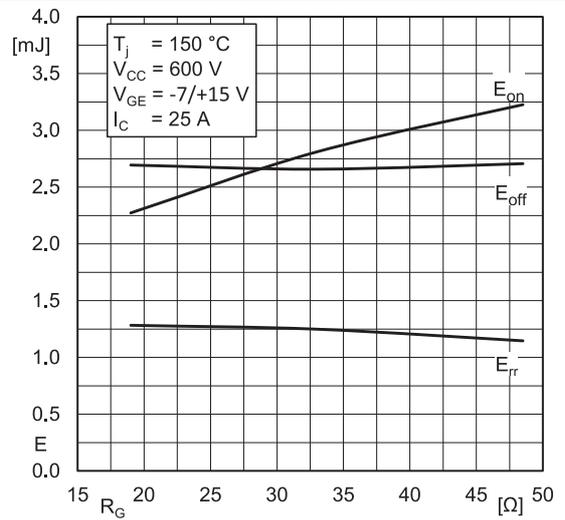


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

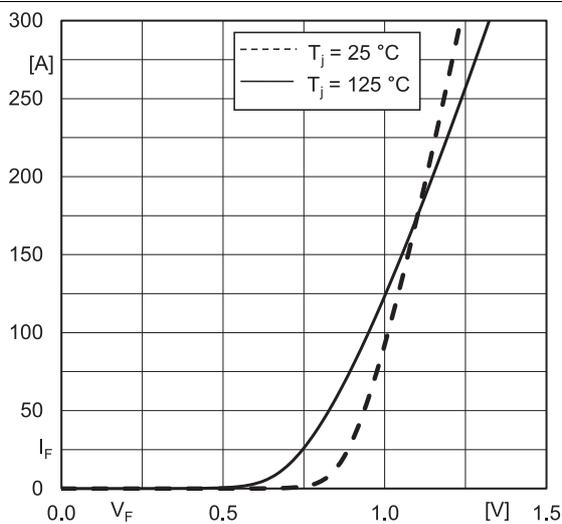


Fig. 5: Typ. IGBT1 transfer characteristic

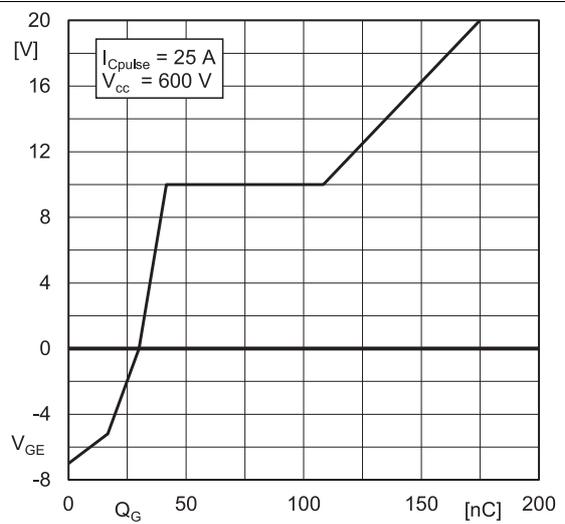


Fig. 6: Typ. gate charge characteristic

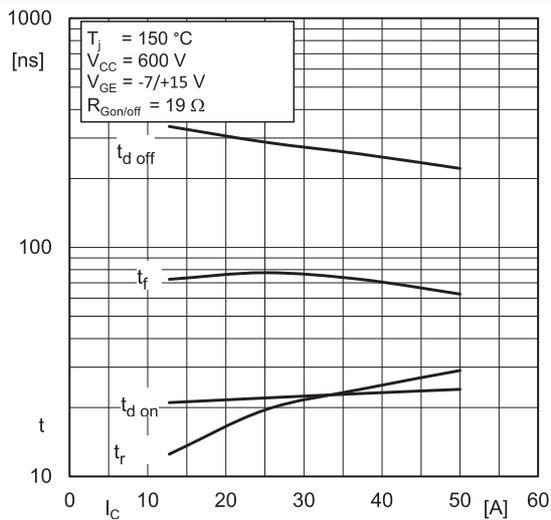


Fig. 7: Typ. switching times vs. I_C

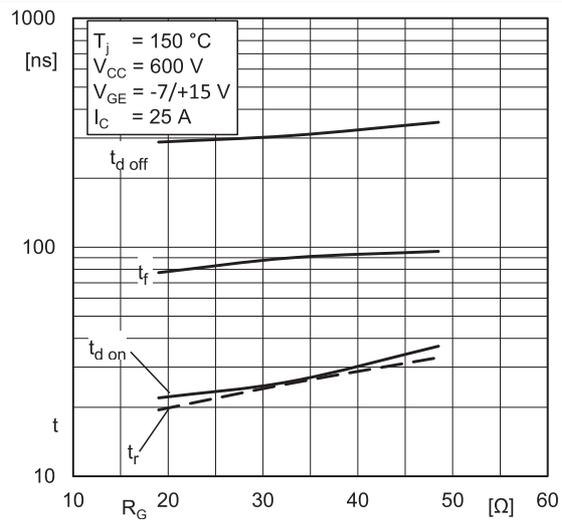


Fig. 8: Typ. switching times vs. gate resistor R_G

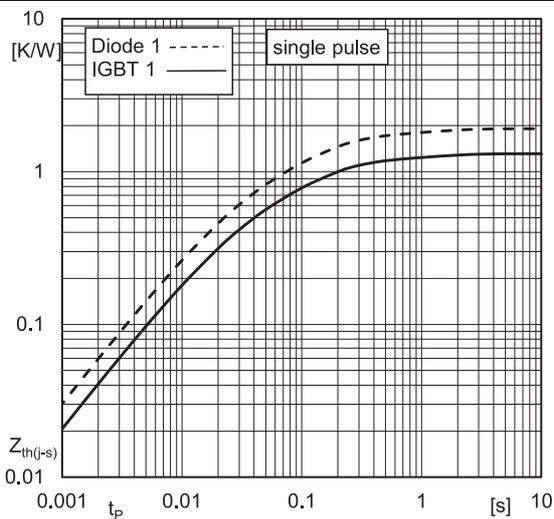


Fig. 9: Typ. transient thermal impedance

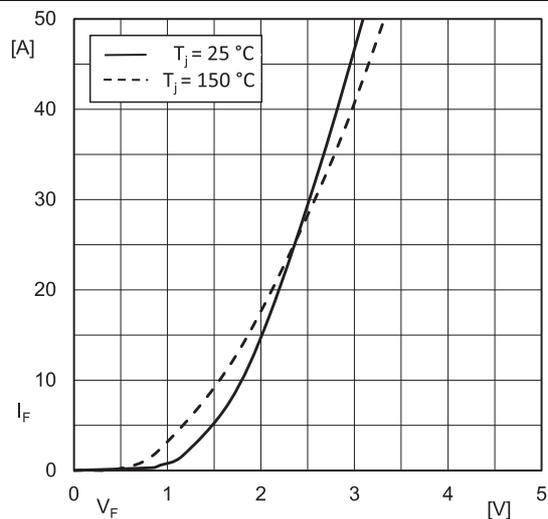
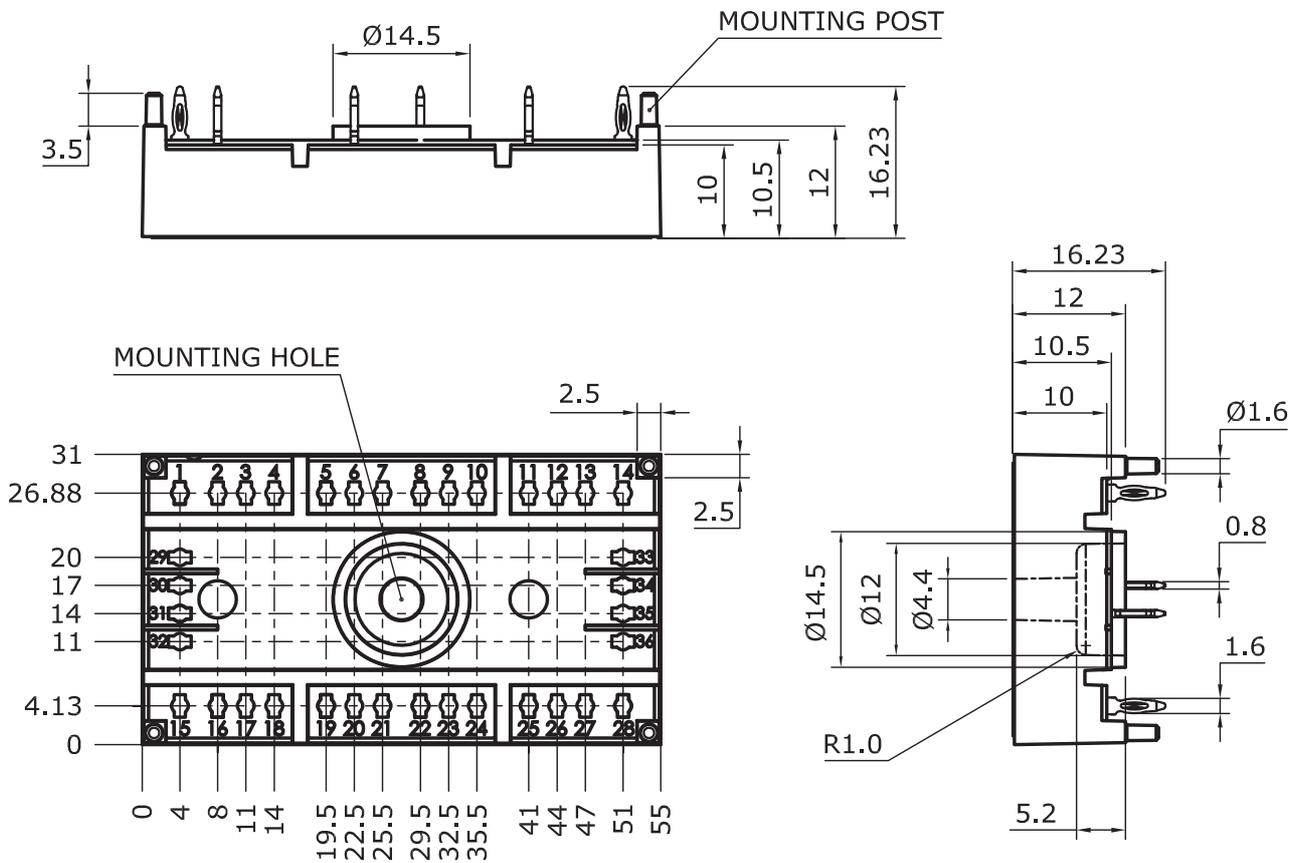


Fig. 10: Typ. CAL diode forward charact., incl. R_{CC'+EE'}

SK 25 GD 12T4 ETp

Dimensions: mm

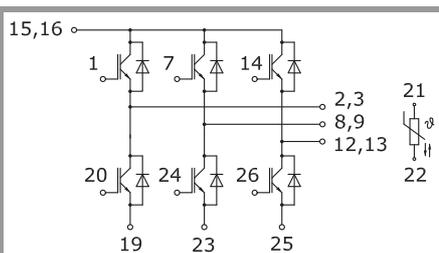
Tolerance system: ISO 2768-m



Suggested drilled hole diameter for terminal pins in the circuit board:
 - refer Mounting Instruction SEMITOP® Classic

These documents are SEMIKRON properties. SEMIKRON reserves all copyrights.
 All copying and transmitting of this information requires written permission.
 For the case of industrial property rights, SEMIKRON reserves all rights.

SEMITOP 3 Press-Fit



GD-ET

This is an electrostatic discharge sensitive device (ESDS) due to international standard IEC 61340.

***IMPORTANT INFORMATION AND WARNINGS**

The specifications of SEMIKRON products may not be considered as guarantee or assurance of product characteristics ("Beschaffenheitsgarantie"). The specifications of SEMIKRON products describe only the usual characteristics of products to be expected in typical applications, which may still vary depending on the specific application. Therefore, products must be tested for the respective application in advance. Application adjustments may be necessary. The user of SEMIKRON products is responsible for the safety of their applications embedding SEMIKRON products and must take adequate safety measures to prevent the applications from causing a physical injury, fire or other problem if any of SEMIKRON products become faulty. The user is responsible to make sure that the application design is compliant with all applicable laws, regulations, norms and standards. Except as otherwise explicitly approved by SEMIKRON in a written document signed by authorized representatives of SEMIKRON, SEMIKRON products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury. No representation or warranty is given and no liability is assumed with respect to the accuracy, completeness and/or use of any information herein, including without limitation, warranties of non-infringement of intellectual property rights of any third party. SEMIKRON does not assume any liability arising out of the applications or use of any product; neither does it convey any license under its patent rights, copyrights, trade secrets or other intellectual property rights, nor the rights of others. SEMIKRON makes no representation or warranty of non-infringement or alleged non-infringement of intellectual property rights of any third party which may arise from applications. Due to technical requirements our products may contain dangerous substances. For information on the types in question please contact the nearest SEMIKRON sales office. This document supersedes and replaces all information previously supplied and may be superseded by updates. SEMIKRON reserves the right to make changes.