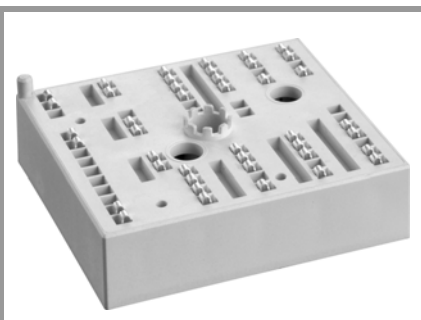


SKiIP 28AHB16V4



MiniSKiIP® 2

SKiIP 28AHB16V4

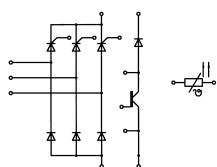
Target Data

Features

- Fast Trench IGBTs
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised file no. E63532
- UL recognised temperature sensor: file no. E257829

Remarks

- V_{CEsat} , V_F = chip level value
- IGBT 1 = brake chopper IGBT
- Diode 1 = brake chopper diode
- Diode 4 = rectifier diode



AHB

Absolute Maximum Ratings				
Symbol	Conditions	Values	Unit	
IGBT 1				
V_{CES}		1200	V	
I_C	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$	116	A
		$T_s = 70\text{ °C}$	87	A
I_{Cnom}		105	A	
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	210	A	
V_{GES}		-20 ... +20	V	
t_{psc}	$V_{CC} = 900\text{ V}$	$T_j = 125\text{ °C}$	10	μs
	$V_{GE} \leq 20$			
	$V_{CES} \leq 1200\text{ V}$			
T_j		-40 ... 150	$^{\circ}\text{C}$	

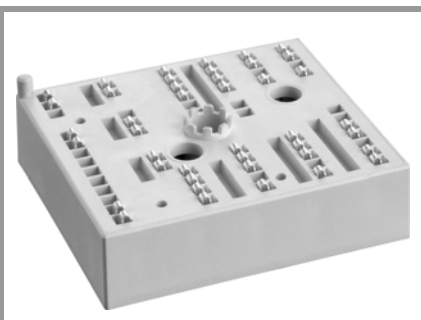
Absolute Maximum Ratings				
Symbol	Conditions	Values	Unit	
Diode 1				
V_{RRM}	$T_j = 25\text{ °C}$	1200	V	
I_F	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$	112	A
		$T_s = 70\text{ °C}$	84	A
I_{Fnom}		105	A	
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	210	A	
I_{FSM}	10 ms, sin 180°, $T_j = 150\text{ °C}$	900	A	
T_j		-40 ... 150	$^{\circ}\text{C}$	

Absolute Maximum Ratings				
Symbol	Conditions	Values	Unit	
Diode 4				
V_{RRM}		1600	V	
I_F	$T_j = 150\text{ °C}$	$T_s = 25\text{ °C}$	117	A
		$T_s = 70\text{ °C}$	86	A
I_{Fnom}		45	A	
I_{FRM}			A	
I_{FSM}	10 ms, sin 180°, $T_j = 150\text{ °C}$	890	A	
I^2t	10 ms, sin. 180°, $T_j = 150\text{ °C}$	3900	A^2s	
T_j		-40 ... 150	$^{\circ}\text{C}$	

Absolute Maximum Ratings			
Symbol	Conditions	Values	Unit
Thyristor			
V_{RRM}		1600	V
$I_{T(AV)}$	$T_j = 130\text{ °C}$, $T_s = 70\text{ °C}$	77	A
I_{TSM}	$t_p = 10\text{ ms}$, sin 180°, $T_j = 25\text{ °C}$	1000	A
i^2t	$t_p = 10\text{ ms}$, sin 180°, $T_j = 25\text{ °C}$	5000	A^2s
T_j		-40 ... 130	$^{\circ}\text{C}$

Absolute Maximum Ratings			
Symbol	Conditions	Values	Unit
Module			
$I_{I(RMS)}$	20A per spring	80	A
T_{stg}		-40 ... 125	$^{\circ}\text{C}$
V_{isol}	AC sinus 50Hz, $t = 1\text{ min}$	2500	V

SKiIP 28AHB16V4



MiniSKiIP® 2

SKiIP 28AHB16V4

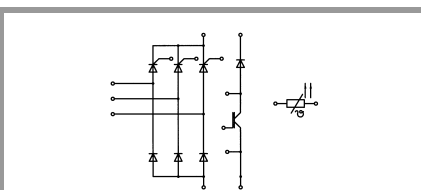
Target Data

Features

- Fast Trench IGBTs
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised file no. E63532
- UL recognised temperature sensor: file no. E257829

Remarks

- V_{CEsat} , V_F = chip level value
- IGBT 1 = brake chopper IGBT
- Diode 1 = brake chopper diode
- Diode 4 = rectifier diode



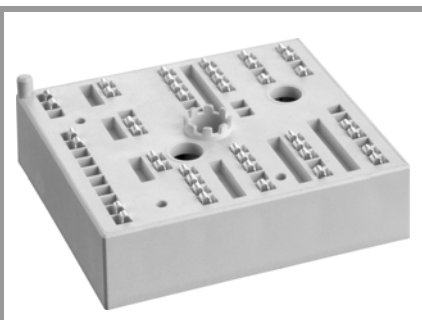
AHB

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
IGBT 1						
$V_{CE(sat)}$	$I_C = 105\text{ A}$ $V_{GE} = 15\text{ V}$ chiplevel	$T_j = 25\text{ °C}$		1.65	2.05	V
		$T_j = 125\text{ °C}$		2.00	2.45	V
V_{CE0}		$T_j = 25\text{ °C}$		1	1.2	V
		$T_j = 125\text{ °C}$		0.9	1.1	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25\text{ °C}$		6	8	mΩ
		$T_j = 125\text{ °C}$		10	13	mΩ
$V_{GE(th)}$	$V_{GE} = V_{CE}\text{ V}, I_C = 4.5\text{ mA}$		5	5.8	6.5	V
I_{CES}	$V_{GE} = 0\text{ V}$	$T_j = 25\text{ °C}$		0.1	0.3	mA
	$V_{CE} = 1200\text{ V}$					mA
C_{ies}	$V_{CE} = 25\text{ V}$ $V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$		7.59		nF
C_{oes}		$f = 1\text{ MHz}$		0.396		nF
C_{res}		$f = 1\text{ MHz}$		0.345		nF
Q_G	$-8\text{ V...}+15\text{ V}$			900		nC
R_{Gint}	$T_j = 25\text{ °C}$			2		Ω
$t_{d(on)}$	$I_C = 105\text{ A}$ $R_{G\ on} = 5.5\text{ Ω}$ $R_{G\ off} = 5.5\text{ Ω}$	$T_j = 125\text{ °C}$		65		ns
t_r		$T_j = 125\text{ °C}$		30		ns
E_{on}		$T_j = 125\text{ °C}$		14.4		mJ
$t_{d(off)}$		$T_j = 125\text{ °C}$		410		ns
t_f		$T_j = 125\text{ °C}$		100		ns
E_{off}	$V_{GE\ neg} = -15\text{ V}$	$T_j = 125\text{ °C}$		13.3		mJ
	$V_{GE\ pos} = 15\text{ V}$					
$R_{th(j-s)}$	per IGBT			0.4		K/W

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Diode 1						
$V_F = V_{EC}$	$I_F = 105\text{ A}$ $V_{GE} = 0\text{ V}$ chiplevel	$T_j = 25\text{ °C}$		1.6	1.9	V
		$T_j = 125\text{ °C}$		1.7	1.9	V
V_{F0}	chiplevel	$T_j = 25\text{ °C}$		1	1.1	V
		$T_j = 125\text{ °C}$		0.8	0.9	V
r_F	chip	$T_j = 25\text{ °C}$		6.7	7.8	mΩ
		$T_j = 125\text{ °C}$		8.9	10.0	mΩ
I_{RRM}	$I_F = 105\text{ A}$	$T_j = 125\text{ °C}$		160		A
Q_{rr}	$di/dt_{off} = 5400\text{ A/μs}$ $V_{GE} = 0\text{ V}$	$T_j = 125\text{ °C}$		26		μC
E_{rr}	$V_R = 600\text{ V}$	$T_j = 125\text{ °C}$		10.8		mJ
$R_{th(j-s)}$	per Diode			0.55		K/W

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Diode 4						
$V_F = V_{EC}$	$I_F = 45\text{ A}$ $V_{GE} = 0\text{ V}$ chiplevel	$T_j = 25\text{ °C}$		1	1.21	V
		$T_j = 125\text{ °C}$			1.1	V
V_{F0}		$T_j = 25\text{ °C}$			1.0	V
		$T_j = 125\text{ °C}$			0.8	V
r_F		$T_j = 25\text{ °C}$			5.2	mΩ
		$T_j = 125\text{ °C}$			6.0	mΩ
I_{RRM}						A
Q_{rr}						μC
E_{rr}						mJ
$R_{th(j-s)}$	per Diode			0.7		K/W

SKiiP 28AHB16V4



MiniSKiiP® 2

SKiiP 28AHB16V4

Target Data

Features

- Fast Trench IGBTs
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised file no. E63532
- UL recognised temperature sensor: file no. E257829

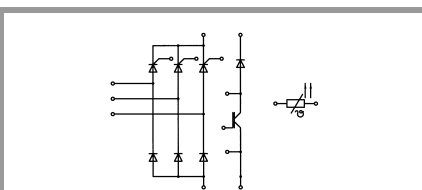
Remarks

- V_{CEsat} , V_F = chip level value
- IGBT 1 = brake chopper IGBT
- Diode 1 = brake chopper diode
- Diode 4 = rectifier diode

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Thyristor						
V_T	$I_T = 80\text{ A}$ chip	$T_j = 25\text{ °C}$			1.2	V
		$T_j = 130\text{ °C}$			1.2	V
$V_{T(TO)}$	$T_j = 130\text{ °C}$				0.85	V
r_T	$T_j = 130\text{ °C}$				4.5	mΩ
V_{GT}	$T_j = 25\text{ °C}$		1.98			V
I_{GT}	$T_j = 25\text{ °C}$		100			mA
I_H	$T_j = 25\text{ °C}$					mA
I_L	$T_j = 25\text{ °C}$					mA
dv/dt_{cr}	$T_j = 130\text{ °C}$				1000	V/μs
di/dt_{cr}	$T_j = 130\text{ °C}$				50	A/μs
$R_{th(j-s)}$				0.65		K/W

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Temperatur Sensor						
R_{100}	$T_r = 100\text{ °C}$, tolerance = 3 %			1670 ± 3%		Ω
$B_{100/125}$	$R(T) = 1000\Omega [1 + A(T - 25\text{ °C}) + B(T - 25\text{ °C})^2]$, A = $7.635 \cdot 10^{-3}\text{ °C}$, B = $1.731 \cdot 10^{-5}\text{ °C}^2$					K

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Module						
M_s	to heat sink		2		2.5	Nm
w				65		g



AHB

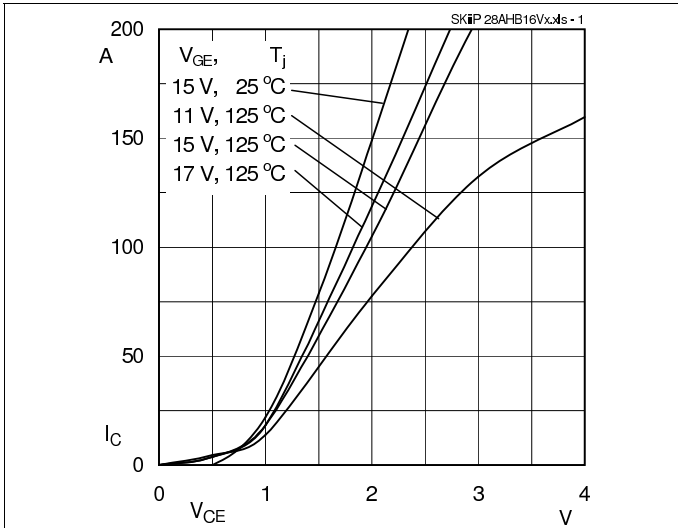


Fig. 1: Typ. output characteristic, inclusive $R_{CC'+EE'}$

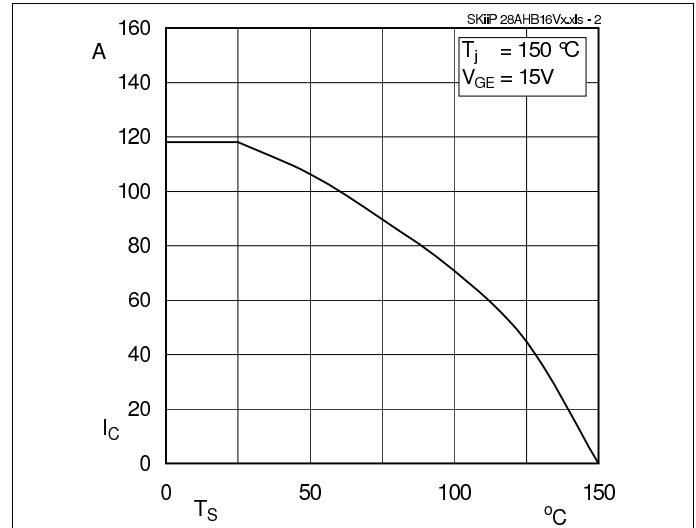


Fig. 2: Rated current vs. temperature $I_C = f(T_S)$

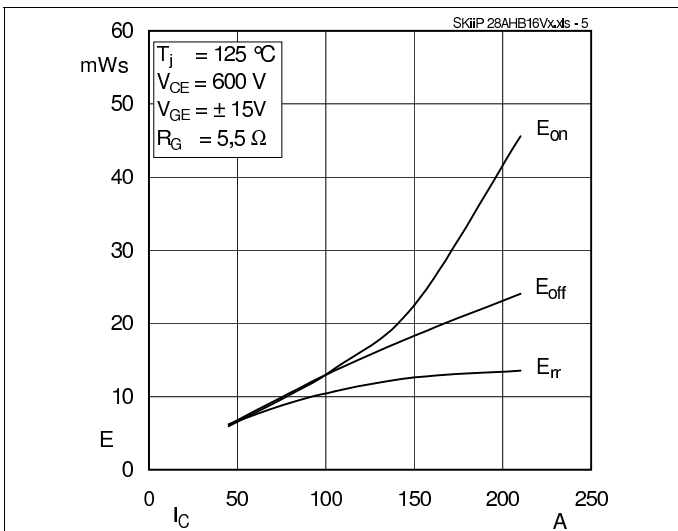


Fig. 3: Typ. turn-on /-off energy = $f(I_C)$

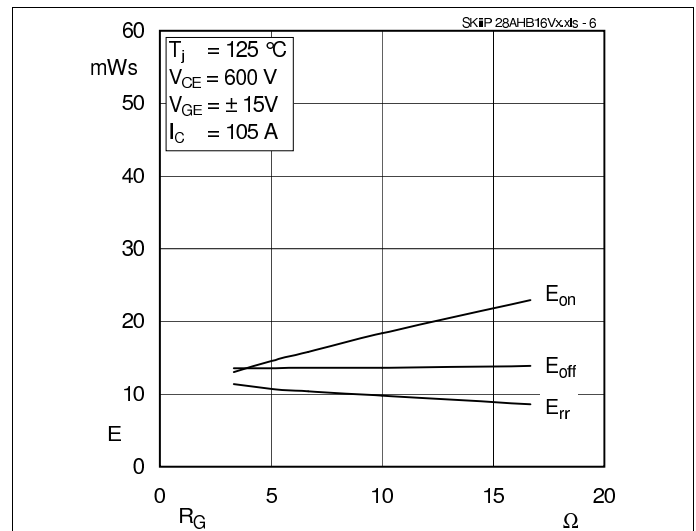


Fig. 4: Typ. turn-on /-off energy = $f(R_G)$

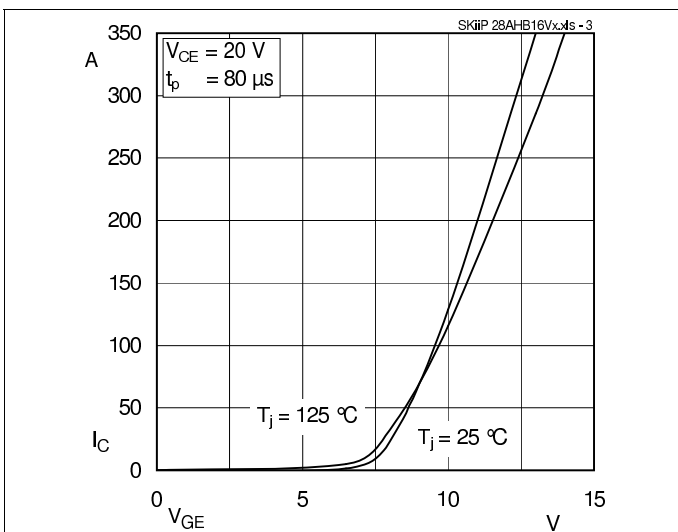


Fig. 5: Typ. transfer characteristic

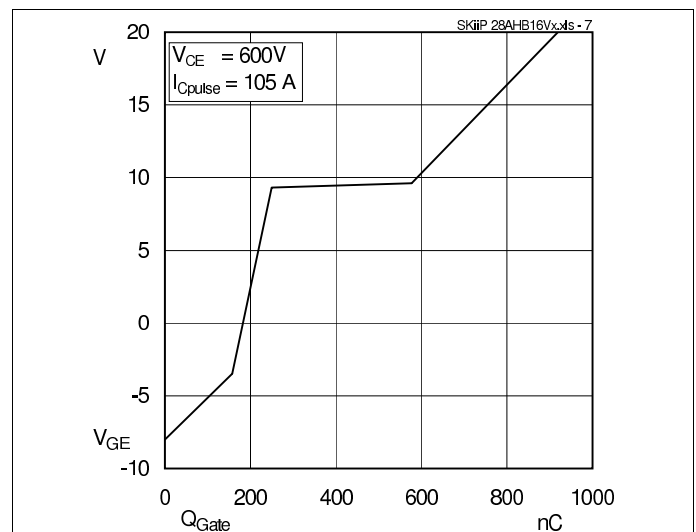


Fig. 6: Typ. gate charge characteristic

