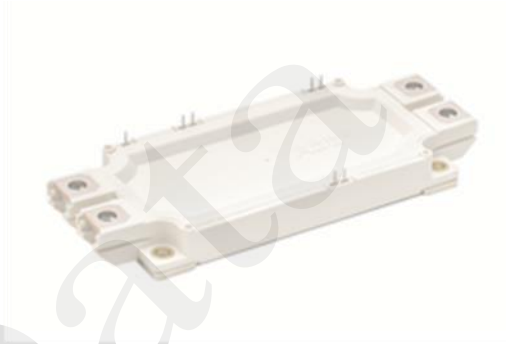
Target Specification

5SNG 0900R120500
1200V 900A LoPak1 Phase Leg IGBT Module

V_{CE} = 1200 V
I_C = 900 A X 2



Press-fit pins for reliable auxiliary contacts
Ultra low-loss rugged Trench IGBT chipset
NTC thermistor for temperature sensing
Cu baseplate for low thermal resistance
Industry standard package

Maximum rated values

Parameter	Symbol	Conditions	min	max	units
Collector-emitter voltage	V_{ces}	V_{GE} = 0 V, T_{vj} ≥ 25 °C		1200	V
DC collector current	I_c	T_C = 115 °C, T_{vj} = 150 °C		900	A
Peak collector current	I_{cm}	t_p = 1 ms		1800	A
Gate-emitter voltage	V_{ges}		-20	20	V
DC forward current	I_f			900	A
Peak forward current	I_{frm}	t_p = 1 ms		1800	A
Surge current	I_{fsm}			2400	A
IGBT short circuit SOA	t_{psc}	t_P ≤ 8 µs, V_{GE} ≤ 15 V, V_{CC} = 800 V $V_{CE,max}$ = V_{CES} -$L_{s,CE}$ ·di/dt, T_{vj} = 150°C		≥10	us
Isolation voltage	V_{isol}	1 min, f = 50 Hz		4000	V
Max Junction temperature	T_{vj}		-40	175	C
Junction operating temperature	$T_{vj(op)}$		-40	150	C
Case temperature	T_c		-40	125/150	C
Storage temperature	T_{stg}		-40	125	C
Mounting torques	M_s, M_{t1}	Base-heatsink, M5 screws or Main terminals, M6 screws	3	6	Nm

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IGBT characteristic values

Parameter	Symbol	Conditions		min	typ	max	units
Collector-emitter breakdown voltage	$V_{(BR)CES}$	V_{GE} = 0 V, I_C = 10 mA, T_{vj} = 25 °C		1300			V
Collector-emitter saturation voltage	V_{CEsat}	I_C = 600A, V_{GE} = 15 V	T_{vj}=25C		1.6		V
			T_{vj}=125C		1.75		V
			T_{vj}=150C		1.9		V
Collector cut-off current	I_{CES}	V_{CE} = 1200 V, V_{GE} = -15 V	T_{vj}=25C			0.1	mA
			T_{vj}=125C		4.5		mA
			T_{vj}=150C		6		mA
Gate leakage current	I_{GES}	V_{CE} = 0 V, $_{VGE}$ = ±20 V				5	nA
Gate-emitter threshold voltage	$V_{GE(th)}$	I_c = 18 mA, V_{CE} = V_{GE}, T_{vj} = 25 °C			5		V
Gate charge	Q_G				TBD		uC
Input capacitance	C_{ies}				TBD		nF
Internal gate resistance	R_{Gint}				1		Ohms
Turn-on delay time	$t_{d(on)}$	I_C = 900A, V_{CE} = 600V, V_{GE} = ±15 V, $R_{G,on}$ = TBD	T_{vj}=25C		300		ns
			T_{vj}=125C		350		ns
			T_{vj}=150C		350		ns
Rise time	t_r		T_{vj}=25C	70		200	ns
			T_{vj}=125C	90		275	ns
			T_{vj}=150C	100		300	ns
Turn-off delay time	$t_{d(off)}$	I_C = 900A, V_{CE} = 600V, V_{GE} = ±15 V, $R_{G,off}$ = TBD	T_{vj}=25C		400		ns
			T_{vj}=125C		475		ns
			T_{vj}=150C		500		ns
Fall time	t_f		T_{vj}=25C		190		ns
			T_{vj}=125C		200		ns
			T_{vj}=150C		200		ns
Turn-on switching energy	E_{on}	I_C = 900A, V_{CE} = 600V, V_{GE} = ±15 V, L_s = 25 nH, $R_{g,on}$ = TBD	T_{vj}=25C	105			mJ
			T_{vj}=125C	150			mJ
			T_{vj}=150C	168		240	mJ
Turn-off switching energy	E_{off}	I_C = 900A, V_{CE} = 600V, V_{GE} = ±15 V, L_s = 25 nH	T_{vj}=25C		132		mJ
			T_{vj}=125C		170		mJ
			T_{vj}=150C		192		mJ
Short circuit current	I_{SC}	t_{psc} ≤ 8 µs, V_{GE} = 15 V, V_{CC} = 1300 V, $V_{CEM\ CHIP}$ ≤ 1700 V	T_{vj}=150C		4500		A

Diode characteristic values

Parameter	Symbol	Conditions		min	typ	max	units
Forward voltage	V_f	I_F = 450 A	T_{vj}=25C		1.6		V
			T_{vj}=125C				V
			T_{vj}=150C		1.7		V
Peak reverse recovery current	I_{rm}	R_g= 8.2 Ohm	T_{vj}=25C		966		A
			T_{vj}=125C				A
			T_{vj}=150C		1041		A
Recovered charge	Q_r	R_g= 8.2 Ohm	T_{vj}=25C		104		uC
			T_{vj}=125C				uC
			T_{vj}=150C		180		uC
Reverse recovery time	t_{rr}	R_g= 8.2 Ohm	T_{vj}=25C				ns
			T_{vj}=125C				ns
			T_{vj}=150C			800	ns
Reverse recovery energy	E_{rec}	I_F = 900A, T_{vj}=150°C, V_R = 600V, V_{GE} = -15 V	T_{vj}=25C		54		mJ
			T_{vj}=125C				mJ
			T_{vj}=150C		84		mJ

NTC Thermistor

Parameter	Symbol	Conditions	min	typ	max	units
Rated resistance	R_{25}	T_c=25C		5		K-ohms
R100	R_{100}	$T_{c=}$100C	468		517	ohms
B-value	$B_{25/50}$	$R_{25} = R_{25} \exp [B_{25/50}(1/T2 – 1/(298.15K))]$		3375		K
B-value	$B_{25/100}$	$R_{25} = R_{25} \exp [B_{25}/100(1/T2 – 1/(298.15K))]$		3433		K

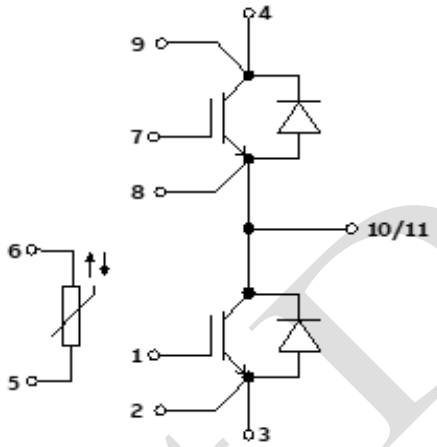
Package properties

Parameter	Symbol	Conditions		min	typ	max	units
IGBT thermal resistance junction to case	$R_{th(j-c)}$ IGBT	per switch				0.048	K/W
Diode thermal resistance junction to case	$R_{th(j-c)}$ DIODE	per switch				0.087	K/W
IGBT thermal resistance case to heatsink	$R_{th(c-s)}$ IGBT	IGBT per switch, λ grease = 1W/m x K			0.029		K/W
Diode thermal resistance case to heatsink	$R_{th(c-s)}$ DIODE	Diode per switch, λ grease = 1W/m x K			0.048		K/W
Comparative tracking index	CTI						
Module stray inductance	$L_{\sigma CE}$	per switch			20		nH
Resistance, terminal-chip	$R_{CC'+EE'}$	per switch	T_{vj}=25C		0.95		m-ohms
			T_{vj}=125C		1.35		
			T_{vj}=150C		1.55		

Mechanical properties

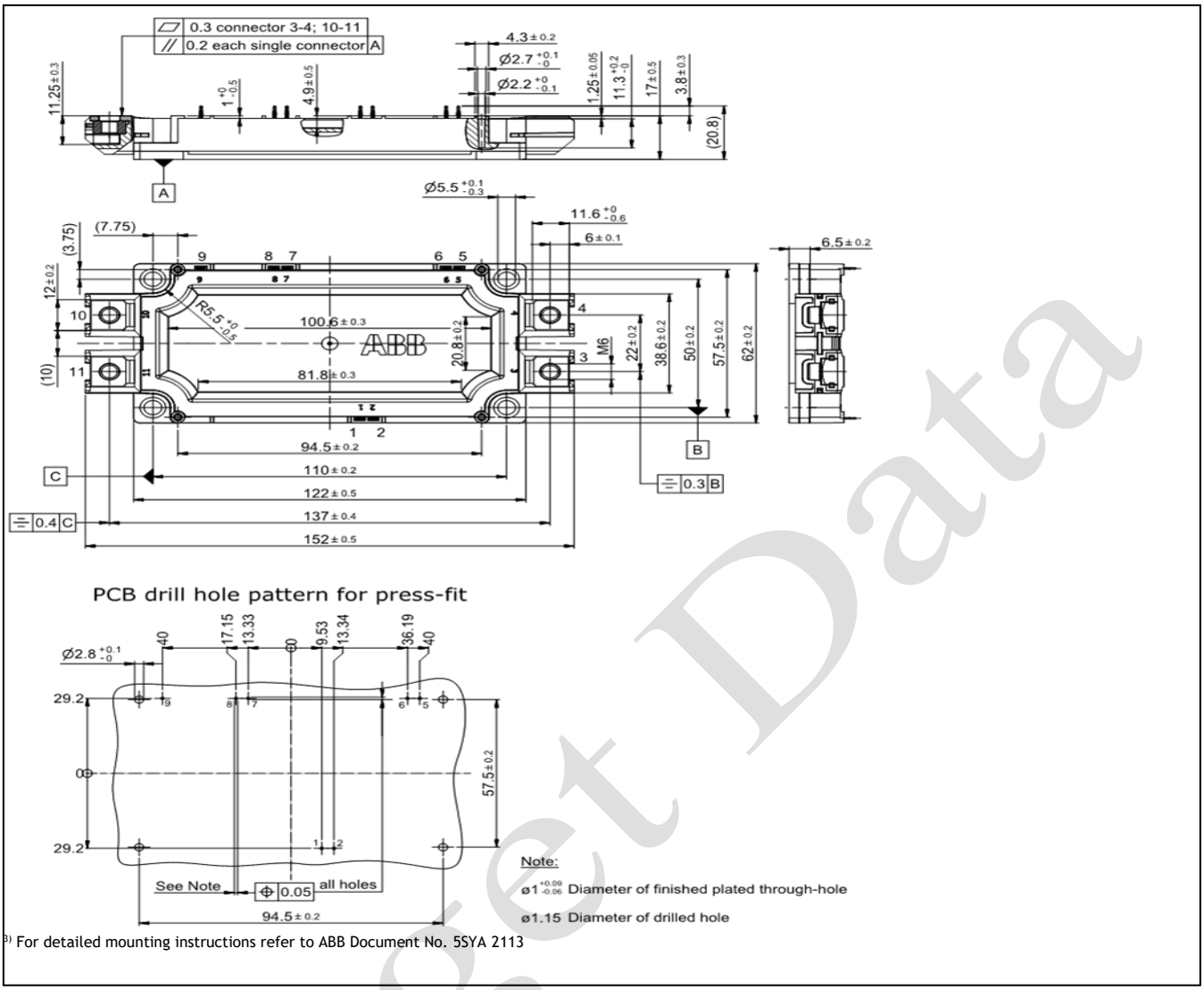
Parameter	Symbol	Conditions		min	typ	max	units
Dimensions	L x W x H	Typical		152 x 62 x 17			mm
Clearance distance in air	d_a	according to IEC 60664-1 and EN 50124-1	Term. to base:	12.5			
			Term. to term:	10			
Surface creepage distance	d_s		Term. to base:	14.5			
			Term. to term:	13			
Mass	m				350		g

Electrical configuration



Outline drawing [3)]

Note: all dimensions are shown in millimeters



[3)] For detailed mounting instructions refer to ABB Document No. 5SYA 2113

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