V_{DRM}	=	4500 V
I_{TGQM}	=	4000 A
I_{TSM}	=	35×10^3 A
$V_{(T0)}$	=	1.15 V
r_T	=	0.21 mΩ
$V_{DC\text{-}link}$		

GCT Data

On-state (see Fig. 3, 4, 5, 6, 14, 15)

Maximum rated values [1)]

Parameter	Symbol	Conditions	min	typ	max	Unit
Max. average on-state current	$I_{T(AV)M}$	Half sine wave, T_C = 85 °C, Double side cooled			2100	A
Max. RMS on-state current	$I_{T(RMS)}$				3300	A
Max. peak non-repetitive surge on-state current	I_{TSM}	t_p = 10 ms, Tj = 125 °C, sine wave after surge: $V_D = V_R$ = 0 V			35×10^3	A
Limiting load integral	I^2t				6.1×10^6	A^2s
Max. peak non-repetitive surge on-state current	I_{TSM}	t_p = 30 ms, Tj = 125 °C, sine wave after surge: $V_D = V_R$ = 0 V			23×10^3	A
Limiting load integral	I^2t				7.9×10^6	A^2s
Stray inductance between GCT and antiparallel diode	L_D	Only relevant for applications with antiparallel diode to the IGCT		l d		

Gate Unit Data

Power supply (see Fig. 2, 9, 10, 12, 13)

Maximum rated values [1)]

Parameter	Symbol	Conditions	min	typ	max	Unit
Gate Unit voltage (Connector X1)	$V_{GIN,RMS}$	AC square wave amplitude (15 kHz - 100kHz) or DC voltage. No galvanic isolation to power circuit.	28		40	V
Min. current needed to power up the Gate Unit	$I_{GIN\ Min}$	Rectified average current see application note 5SYA 2031	2.1			A
Gate Unit power consumption	$P_{GIN\ Max}$				100	W

Characteristic values

Parameter	Symbol	Conditions	min	typ	max	Unit
Internal current limitation	$I_{GIN\ Max}$	Rectified average current limited by the Gate Unit			8	A

Optical control input/output [2)]

Maximum rated values [1)]

Parameter	Symbol	Conditions	min	typ	max	Unit
Min. on-time	t_{on}		40			µs
Min. off-time	t_{off}		40			µs

Characteristic values

Parameter	Symbol	Conditions	min	typ	max	Unit
Optical input power	$P_{on\ CS}$	CS: Control signal SF: Status feedback Valid for 1mm plastic optical fiber (POF)	-15		-1	dBm
Optical noise power	$P_{off\ CS}$				-45	dBm
Optical output power	$P_{on\ SF}$		-19		-1	dBm
Optical noise power	$P_{off\ SF}$				-50.0	dBm
Pulse width threshold	t_{GLITCH}	Max. pulse width without response			400	ns
External retrigger pulse width	t_{retrig}		600		1100	ns

2) Do not disconnect or connect fiber optic cables while light is on.

Connectors [2)] (see Fig. 11, 12, 13)

Parameter	Symbol	Description
Gate Unit power connector	X1	AMP: MTA-156, Part Number 641210-5 [3)]
LWL receiver for command signal	CS	Agilent, Type HFBR-2528 [4)]
LWL transmitter for status feedback	SF	Agilent, Type HFBR-1528 [4)]

2) Do not disconnect or connect fiber optic cables while light is on.

3) AMP, www.amp.com

4) Agilent Technologies, www.semiconductor.agilent.com

Visual feedback (see Fig. 13)

Parameter	Symbol	Description	Color
Gate OFF	LED1	"Light" when GCT is off	(green)
Gate ON	LED2	"Light" when gate-current is flowing	(yellow)
Fault	LED3	"Light" when not ready / Failure	(red)
Power supply voltage OK	LED4	"Light" when power supply is within specified range	(green)

Thermal

Maximum rated values [1)]

Parameter	Symbol	Conditions	min	typ	max	Unit
Junction operating temperature	T_{vj}		-40		125	°C
Storage temperature range	T_{stg}		-40		60	°C
Ambient operational temperature	T_a		-40		50	°C

Characteristic values

Parameter	Symbol	Conditions	min	typ	max	Unit
Thermal resistance junction-to-case of GCT	$R_{th(j-c)}$	Double side cooled			8.5	K/kW
Thermal resistance case-to-heatsin-c						

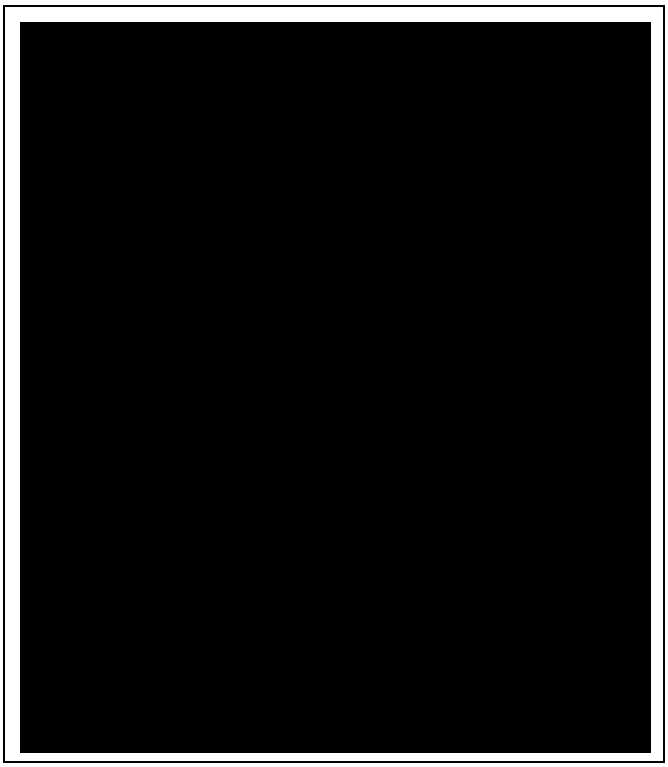


Fig. 7 GCT turn-off energy per pulse vs. turn-off current

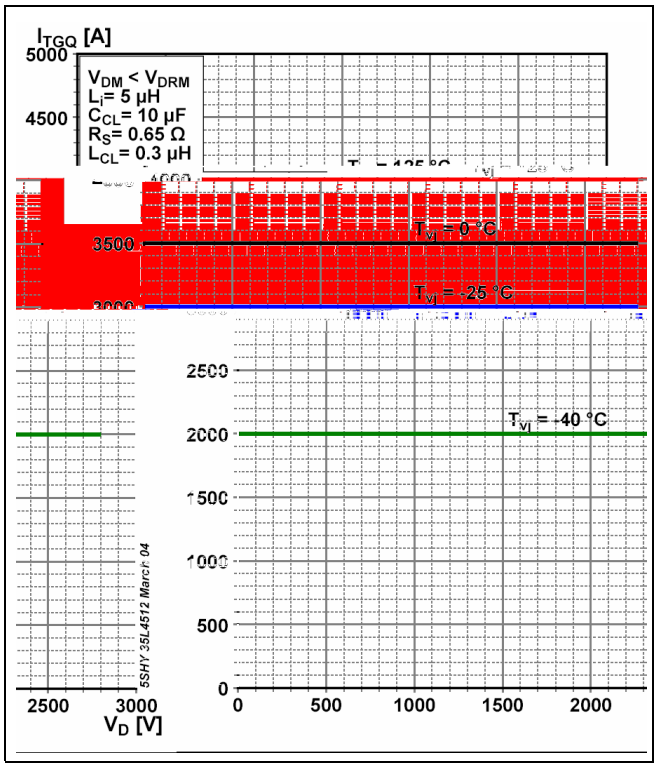


Fig. 8 Safe Operating Area

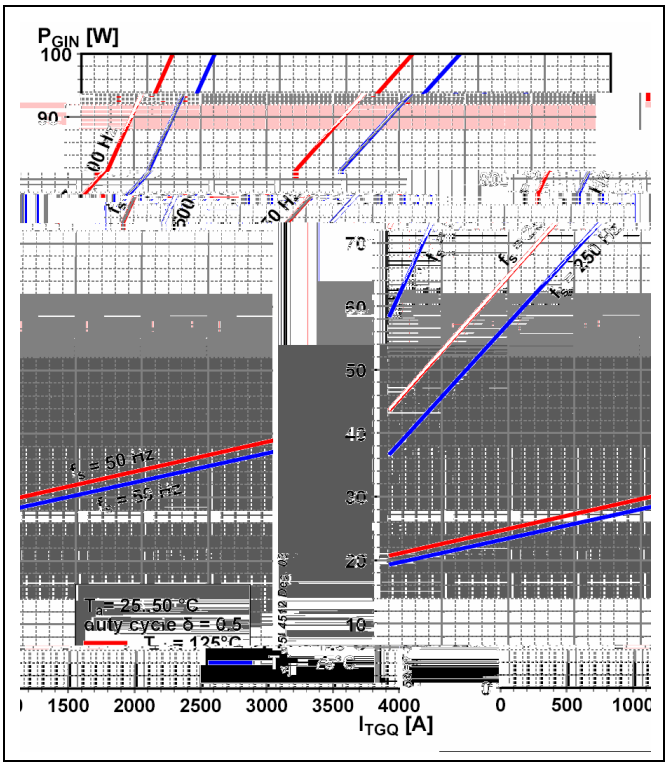


Fig. 9 Max. Gate Unit input power in chopper mode

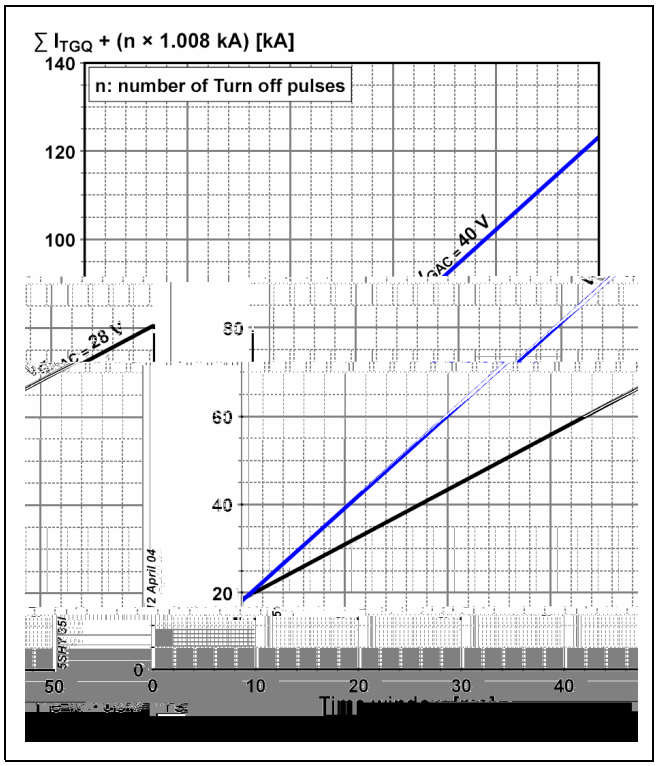
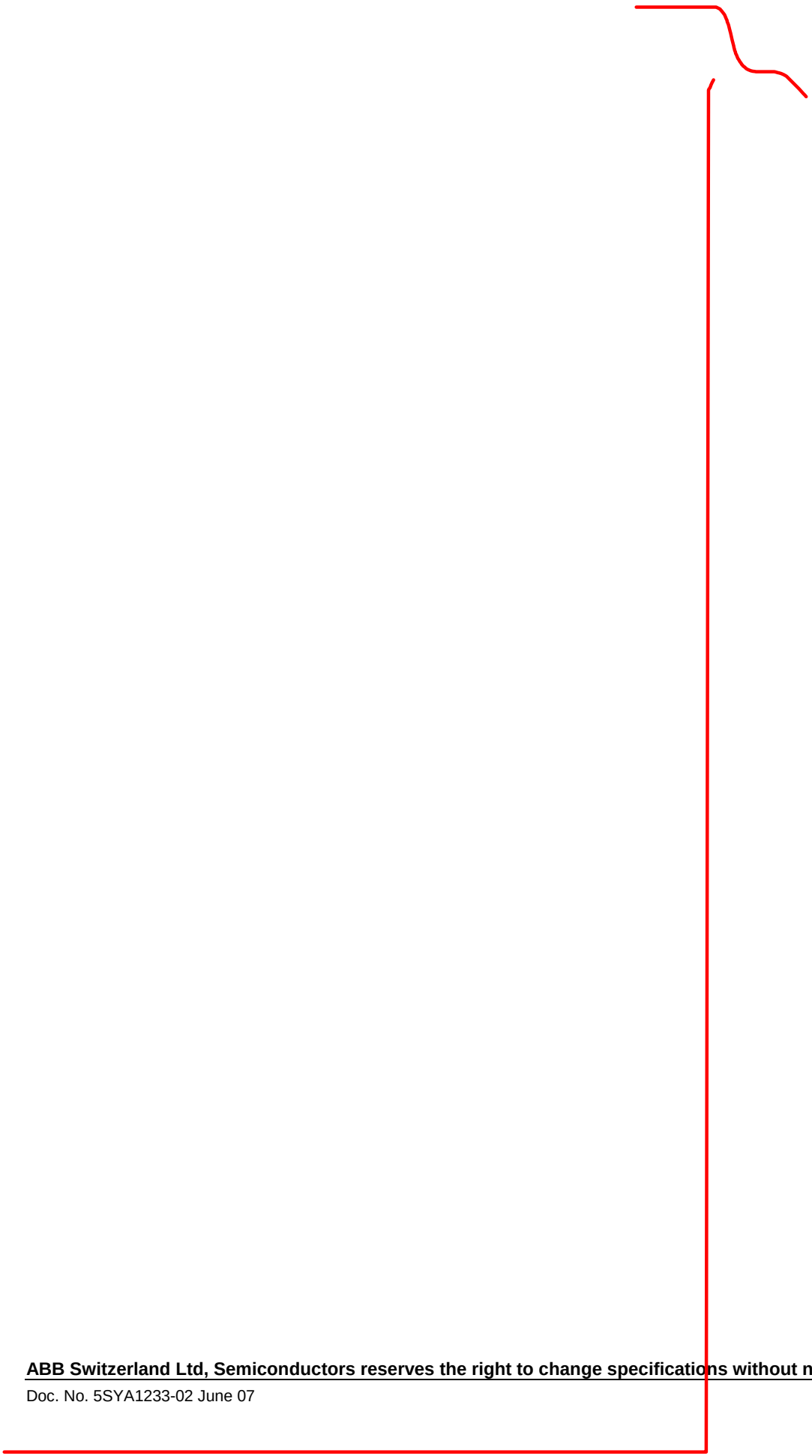


Fig. 10 Burst capability of Gate Unit



Related documents:

5SYA 2031	Applying IGCT Gate Units
5SYA 2032	Applying IGCTs
5SYA 2036	Recommendations regarding mechanical clamping of Press Pack High Power Semiconductors
5SYA 2046	Failure rates of IGCTs due to cosmic rays
5SYA 2048	Field measurements on High Power Press Pack Semiconductors
5SYA 2051	Voltage ratings of high power semiconductors
5SZK 9107	Specification of enviromental class for pressure contact IGCTs, OPERATION available on request, please contact factory

Please refer to http://www.abb.com/semiconductors for current version of documents.

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