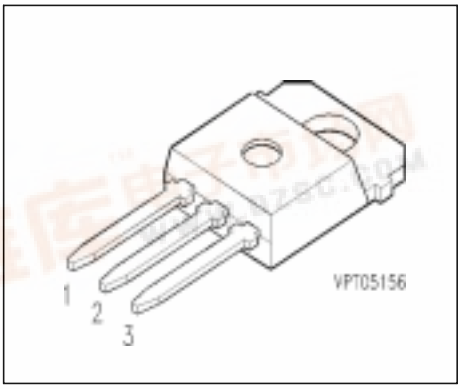
SIEMENS

BUP 314S

Preliminary data

IGBT



- High switching speed
- Very low switching losses
- Low tail current
- Latch-up free
- Avalanche rated

Pin 1	Pin 2	Pin 3
G	C	E

Type	V_{CE}	I_C	Package	Ordering Code
BUP 314S	1200V	25A	TO-218 AB	C67040-A4207-A2

Maximum Ratings

Parameter	Symbol	Values	Unit
Collector-emitter voltage	V_{CE}	1200	V
Collector-gate voltage R_{GE} = 20 kΩ	V_{CGR}	1200	
Gate-emitter voltage	V_{GE}	± 20	
DC collector current T_C = 25 °C T_C = 90 °C	I_C	 25 17	A
Pulsed collector current, t_p = 1 ms T_C = 25 °C T_C = 90 °C	I_{Cpuls}	 50 34	
Avalanche energy, single pulse I_C = 25 A, V_{CC} = 50 V, R_{GE} = 25 Ω L = 200 µH, T_j = 25 °C	E_{AS}	65	mJ
Power dissipation T_C = 25 °C	P_{tot}	300	W
Chip or operating temperature	T_j	-55 ... + 150	°C
Storage temperature	T_{stg}	-55 ... + 150	

Maximum Ratings

Parameter	Symbol	Values	Unit
DIN humidity category, DIN 40 040	-	E	-
IEC climatic category, DIN IEC 68-1	-	55 / 150 / 56	

Thermal Resistance

Thermal resistance, chip case	R_{thJC}	≤ 0.42	K/W

Electrical Characteristics, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static Characteristics					
Collector-emitter breakdown voltage V_{GE} = 0 V, I_C = 0.3 mA, T_j = 25 °C	$V_{(BR)CES}$	1200	-	-	V
Gate threshold voltage V_{GE} = V_{CE}, I_C = 0.35 mA, T_j = 25 °C	$V_{GE(th)}$	4.5	5.5	6.5	
Collector-emitter saturation voltage V_{GE} = 15 V, I_C = 15 A, T_j = 25 °C V_{GE} = 15 V, I_C = 15 A, T_j = 125 °C V_{GE} = 15 V, I_C = 30 A, T_j = 25 °C V_{GE} = 15 V, I_C = 30 A, T_j = 125 °C	$V_{CE(sat)}$	 - - - -	 5.5 4.6 8 6.6	 7.6 - - -	
Zero gate voltage collector current V_{CE} = 1200 V, V_{GE} = 0 V, T_j = 25 °C	I_{CES}	-	-	0.8	mA
Gate-emitter leakage current V_{GE} = 25 V, V_{CE} = 0 V	I_{GES}	-	-	100	nA

AC Characteristics

Transconductance V_{CE} = 20 V, I_C = 15 A	g_{fs}	8.5	12	-	S
Input capacitance V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz	C_{iss}	-	1950	2600	pF
Output capacitance V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz	C_{oss}	-	180	270	
Reverse transfer capacitance V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz	C_{rss}	-	120	180	

Electrical Characteristics, at T_j = 25 °C, unless otherwise specified

Parameter	**Symbol**	**Values**			**Unit**
		min.	**typ.**	**max.**	

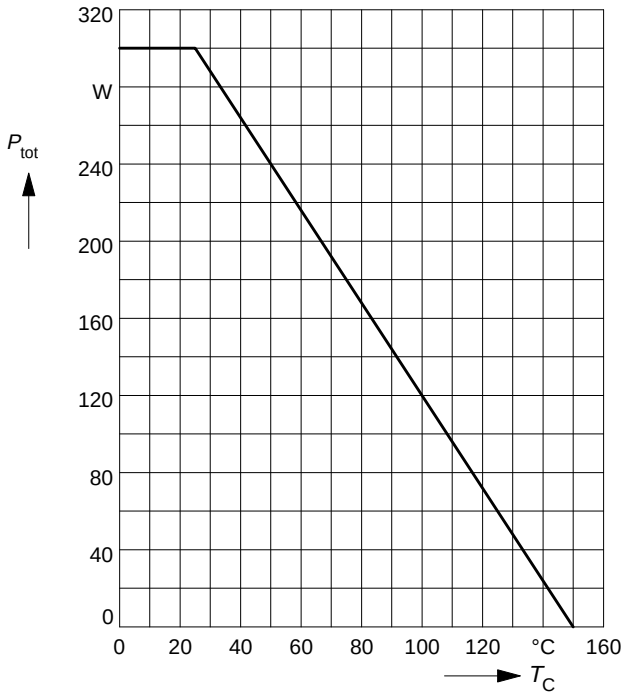
Switching Characteristics, Inductive Load at T_j = 125 °C

Turn-on delay time V_{CC} = 600 V, V_{GE} = 15 V, I_C = 15 A R_{Gon} = 47 Ω	$t_{d(on)}$	-	65	100	ns
Rise time V_{CC} = 600 V, V_{GE} = 15 V, I_C = 15 A R_{Gon} = 47 Ω	t_r	-	60	90	
Turn-off delay time V_{CC} = 600 V, V_{GE} = -15 V, I_C = 15 A R_{Goff} = 47 Ω	$t_{d(off)}$	-	420	560	
Fall time V_{CC} = 600 V, V_{GE} = -15 V, I_C = 15 A R_{Goff} = 47 Ω	t_f	-	70	95	

Power dissipation

$P_{tot} = f(T_C)$

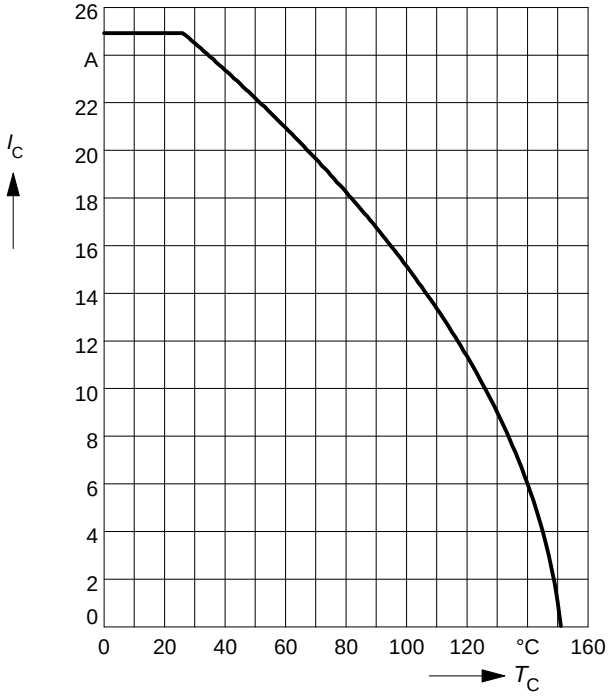
parameter: $T_j \leq 150$ °C



Collector current

$I_C = f(T_C)$

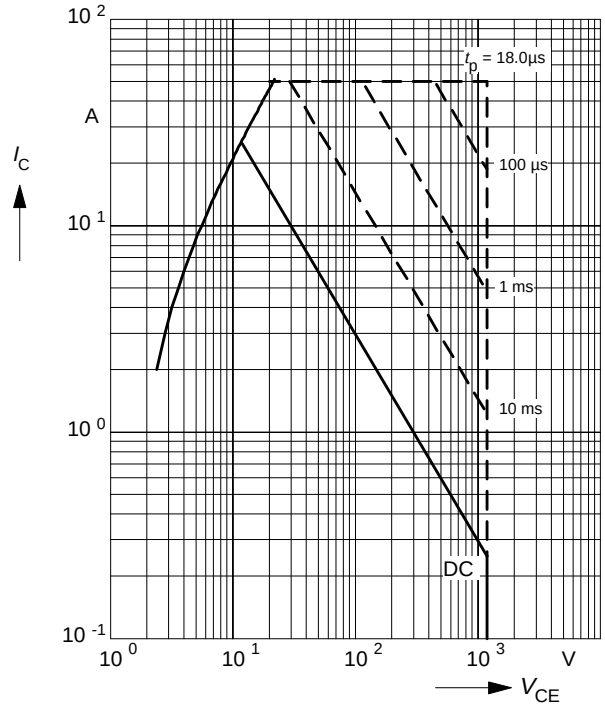
parameter: $V_{GE} \geq 15$ V , $T_j \leq 150$ °C



Safe operating area

$I_C = f(V_{CE})$

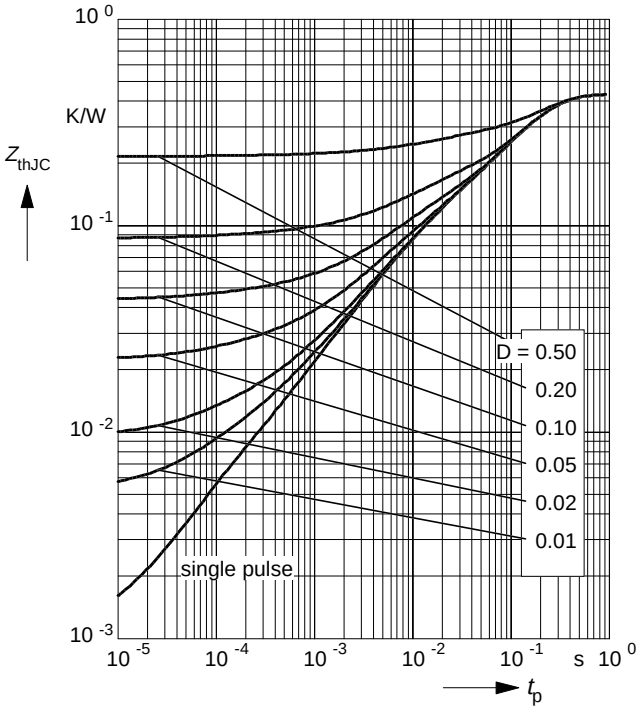
parameter: $D = 0$, $T_C = 25$°C , $T_j \leq 150$ °C



Transient thermal impedance IGBT

$Z_{th\,JC} = f(t_p)$

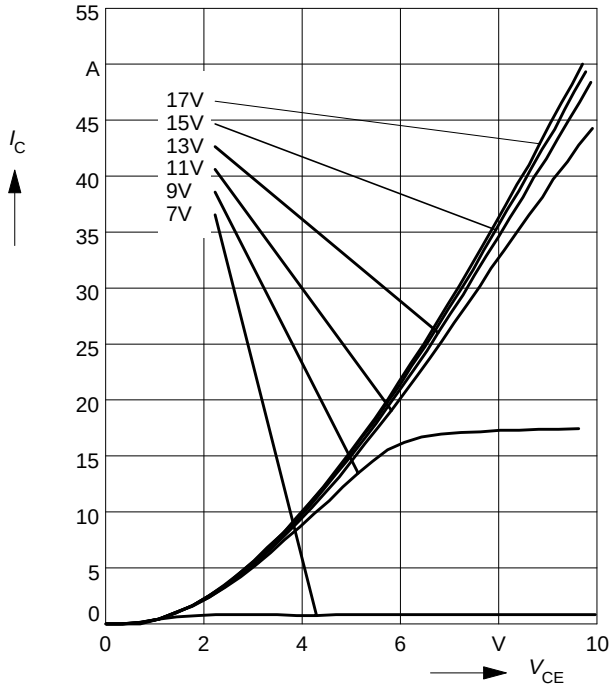
parameter: $D = t_p / T$



Typ. output characteristics

$I_C = f(V_{CE})$

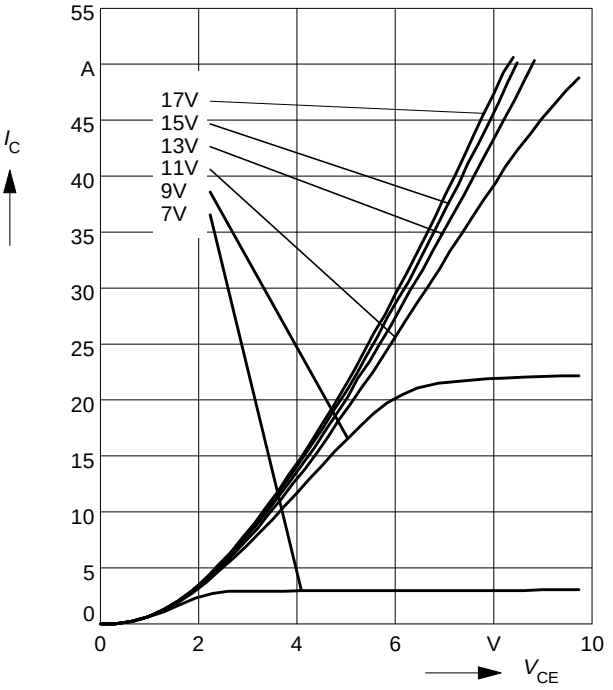
parameter: t_p = 80 µs, T_j = 25 °C



Typ. output characteristics

$I_C = f(V_{CE})$

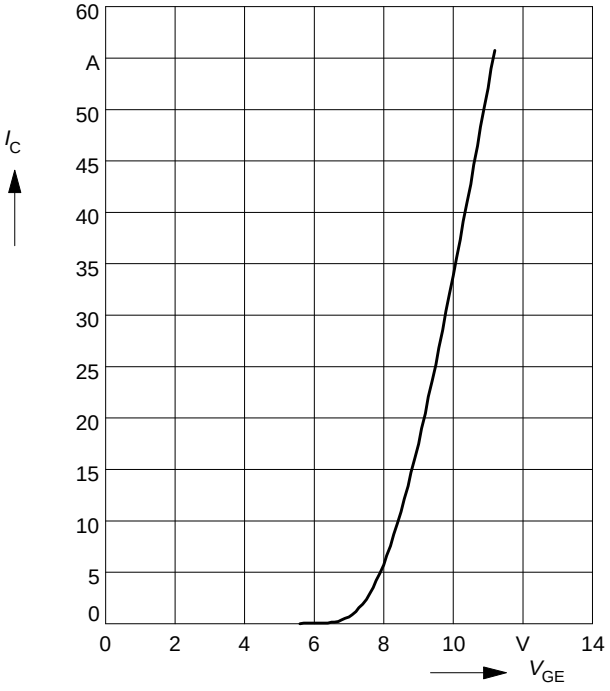
parameter: t_p = 80 µs, T_j = 125 °C



Typ. transfer characteristics

$I_C = f(V_{GE})$

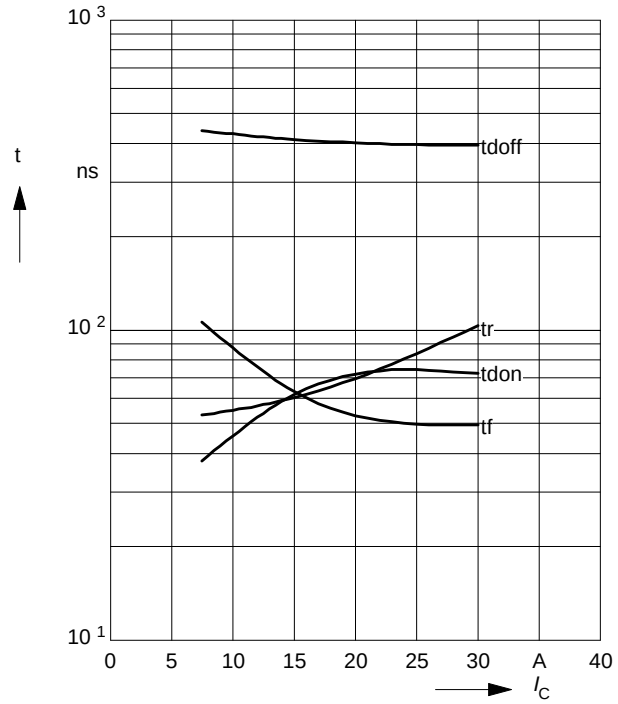
parameter: t_p=80µs, V_{CE}=20 V



Typ. switching time

$t = f(I_C)$, inductive load , T_j = 125°C

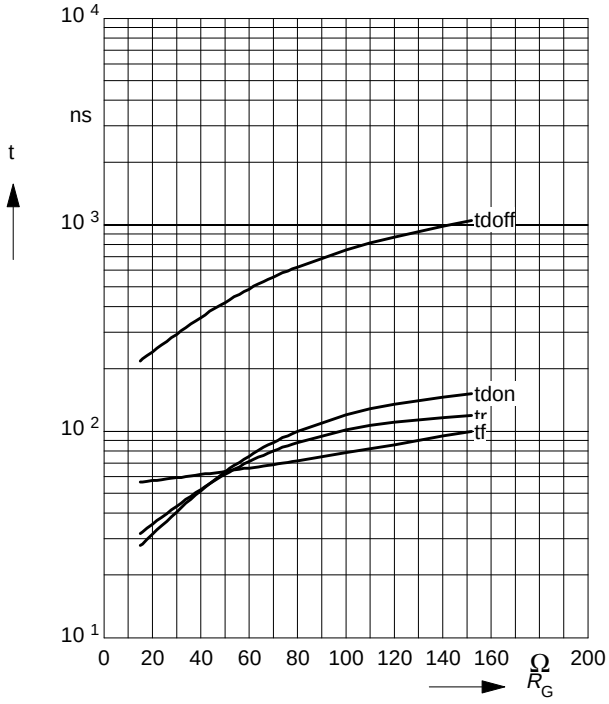
par.: V_{CE} = 600 V, V_{GE} = ± 15 V, R_G = 47Ω



Typ. switching time

$t = f(R_G)$, inductive load , T_j = 125°C

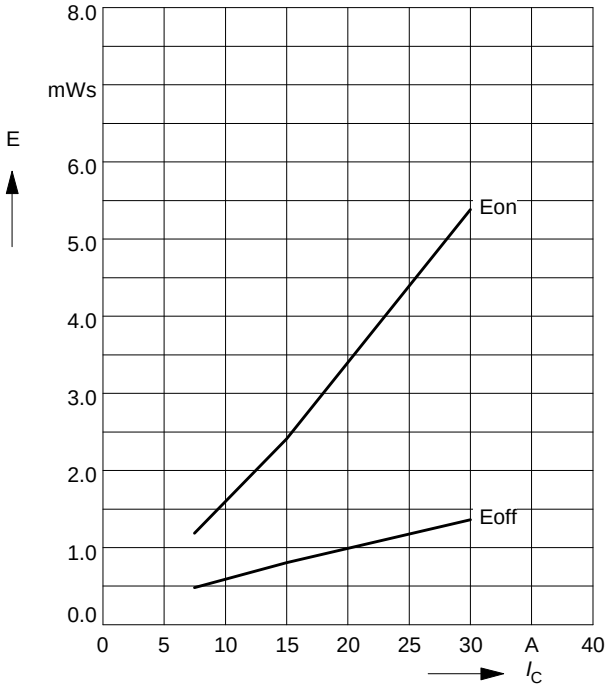
par.: V_{CE} = 600 V, V_{GE} = ± 15 V, I_C = 15 A



Typ. switching losses

$E = f(I_C)$, inductive load , T_j = 125°C

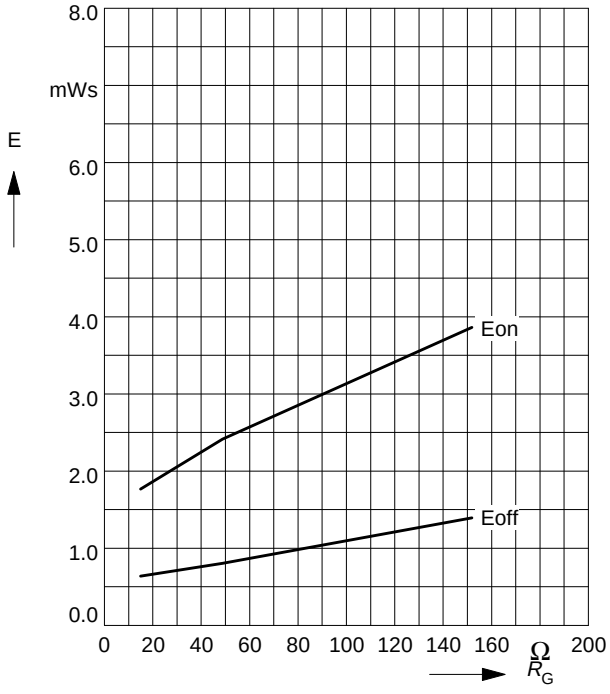
par.: V_{CE} = 600 V, V_{GE} = ± 15 V, R_G = 48.9Ω



Typ. switching losses

$E = f(R_G)$, inductive load , T_j = 125°C

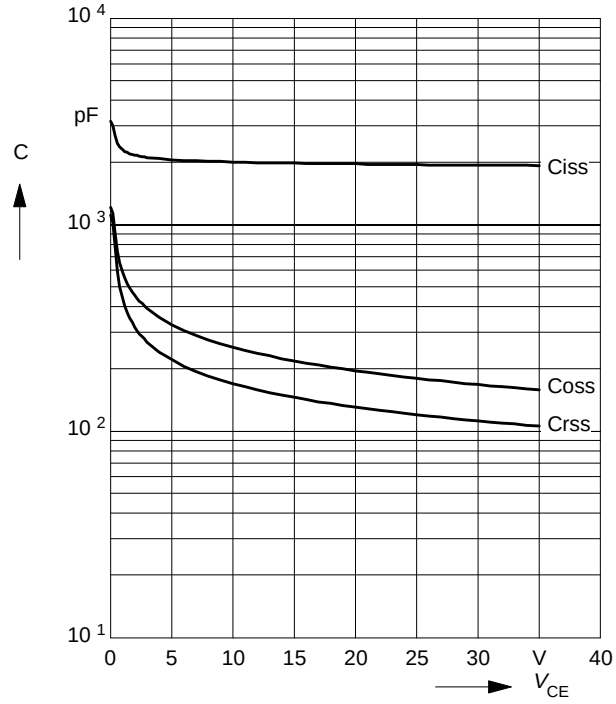
par.: V_{CE} = 600 V, V_{GE} = ± 15 V, I_C = 15 A



Typ. capacitances

$C = f(V_{CE})$

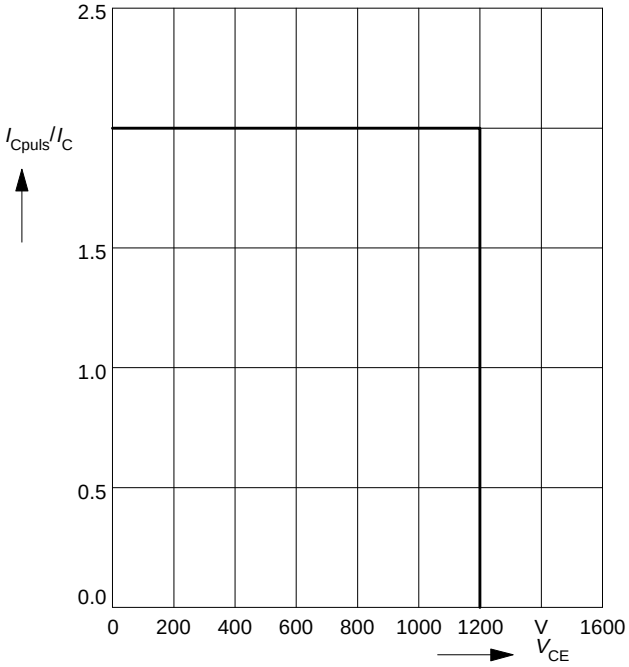
parameter: V_{GE} = 0 V, f = 1 MHz



Reverse biased safe operating area

$I_{Cpuls} = f(V_{CE})$, T_j = 150°C

parameter: V_{GE} = 15 V



Short circuit safe operating area

$I_{Csc} = f(V_{CE})$, T_j = 150°C

parameter: V_{GE} = ± 15 V, $t_{sc} \leq$ 10 µs, L < 25 nH