SML300HB12GG

Attributes:
-Aerospace build standard
-High reliability
-Lightweight
-Cu and metal matrix base plate versions (pin finned versions available)
-AlN isolation
-Trench gate igbts

Maximum rated values/Electrical Properties

Collector-emitter voltage		V_{ce}	1200	V
DC collector current	Tc=70C, Tvj=175C Tc=25C,Tvj=175C	I_c, nom Ic	320 455	A
Repetitive peak collector current	tp=1msec,Tc=80C	I_{crm}	600	A
Total power dissipation	Tc=25C	P_{tot}	850	W
Gate-emitter peak voltage		V_{ges}	+/-20	V
DC forward diode current		I_f	400	A
Repetitive peak forward current	tp=1msec	I_{frm}	800	A
I^2t value per diode	Vr=0V, tp=10msec, Tvj=125C Tvj=150C	I^2_t	11000 10500	A^2sec
Isolation test voltage	RMS, 50Hz, t=1min	V_{isol}	2500	V

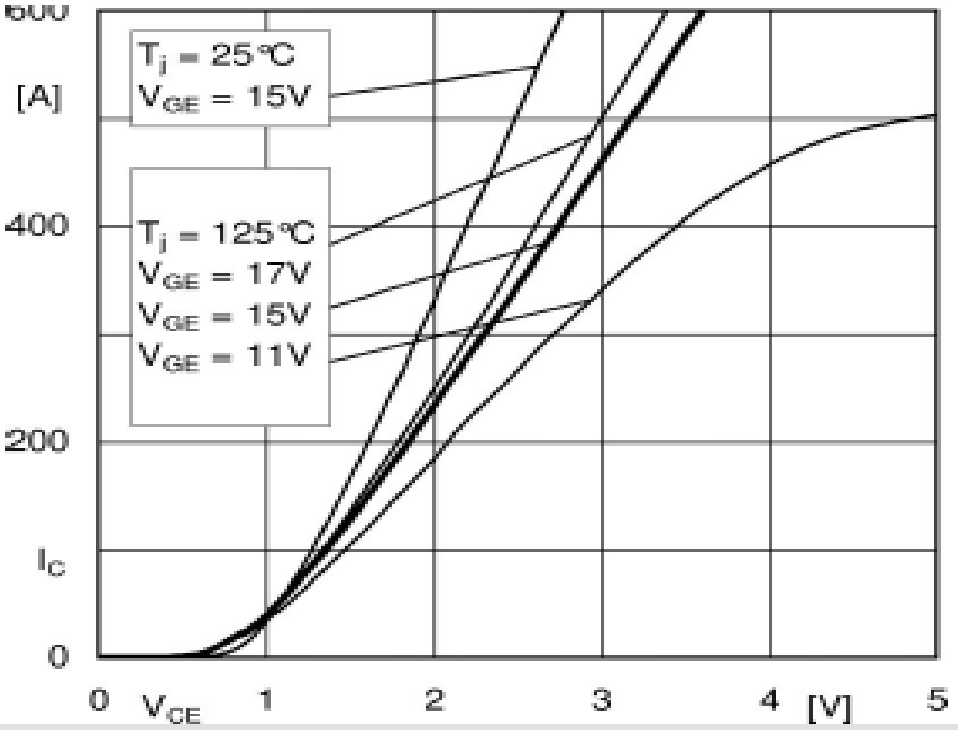
Collector-emitter saturation voltage	Ic=300A,Vge=15V, Tc=25C Ic=300A,Vge=15V,Tc=125C Ic=300A,Vge=15V,Tc=150C	$V_{ce(sat)}$		1.7 2.0	2.15 2.45	V
Gate threshold voltage	Ic=6.4mA,Vce=Vge, Tvj=25C	$Vge_{(th)}$	5.0	5.8	6.5	V
Input capacitance	f=1MHz,Tvj=25C,Vce=25V, Vge=0V	C_{ies}		21.5		nF
Reverse transfer capacitance	f=1MHz,Tvj=25C,Vce=25V, Vge=0V	C_{res}		0.98		nF
Collector emitter cut off current	Vce=1200V,Vge=0V,Tvj=25C Vce=1200,Vge=0V,Tvj=125C	I_{ces}			0.3	mA mA
Gate emitter cut off current	Vce=0V,Vge=20V,Tvj=25C	I_{ges}			400	nA

Turn on delay time	Ic=300A, Vcc=600V Vge=+/-15V,Rg=2Ω,Tvj=125C	$t_{d,on}$		280		nsec
Rise time	Ic=300A, Vcc=600V Vge=+/-15V,Rg=2Ω,Tvj=125C	tr		65		nsec
Turn off delay time	Ic=300A, Vcc=600V Vge=+/-15V,Rg=2Ω,Tvj=125C	$t_{d,off}$		630		nsec
Fall time	Ic=300A, Vcc=600V Vge=+/-15V,Rg=2Ω, Tvj=125C	t_f		130		nsec
Turn on energy loss per pulse	Ic=300A,Vce=600V,Vge=15V Rge=2Ω,L=30nH Tvj=125C	E_{on}		35		mJ
Turn off energy loss per pulse	Ic=300A,Vce=600V,Vge=15V Rge=2Ω,L=30nH Tvj=125C	E_{off}		45		mJ
SC Data	tp≤10µsec, Vge≤15V Vcc=360V, Tvj=25C $Vce_{(max)}$=Vces-Lσdi/dt Tvj=150C	I_{sc}		2800 2000		A A
Stray Module inductance		$L_{σce}$		18		nH
Terminal-chip resistance		R_c		1.0		mΩ

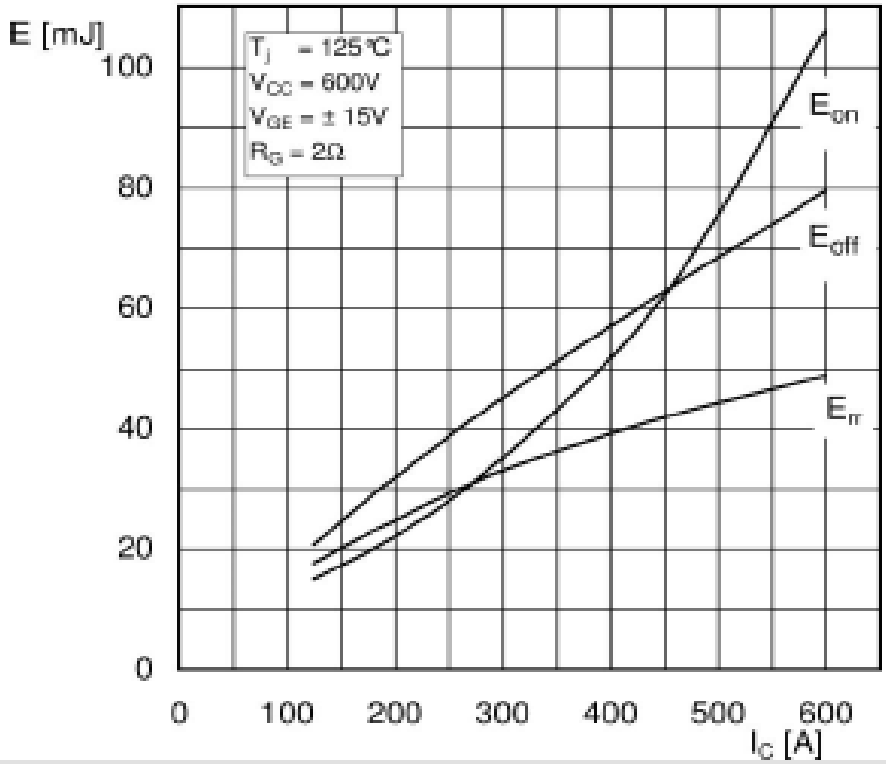
Diode characteristics

Forward voltage	Ic=300A,Vge=0V, Tc=25C Ic=300A,Vge=0V, Tc=125C	V_f		1.6 1.6	1.8 1.8	V V
Peak reverse recovery current	If=300A, -di/dt=6200A/µsec Vce=300V,Vge=-10V,Tvj=125C	I_{rm}		375		A
Recovered charge	If=300A, -di/dt=6200A/µsec Vce=600V,Vge=-10V,Tvj=125C	Qr		75		µC
Reverse recovery energy	If=300A, -di/dt=6200A/µsec Vce=600V,Vge=-10V,Tvj=125C	E_{rec}		33		mJ

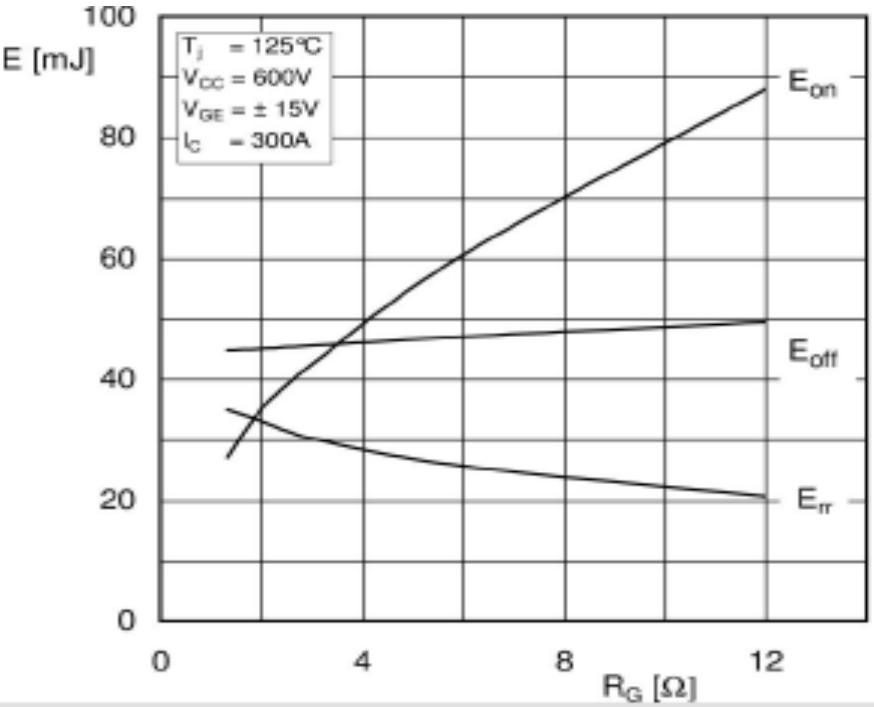
Thermal Properties			Min	Typ	Max	
Thermal resistance junction to case (MMC)	Igbt Diode	$R_{\theta J-C}$			0.042 0.1	K/W
Thermal resistance case to heatsink		$R_{\theta C-hs}$		0.045		K/W
Maximum junction temperature		Tvj			175	C
Maximum operating temperature		Top	-55		175	C
Storage Temperature		Tstg	-55		175	C



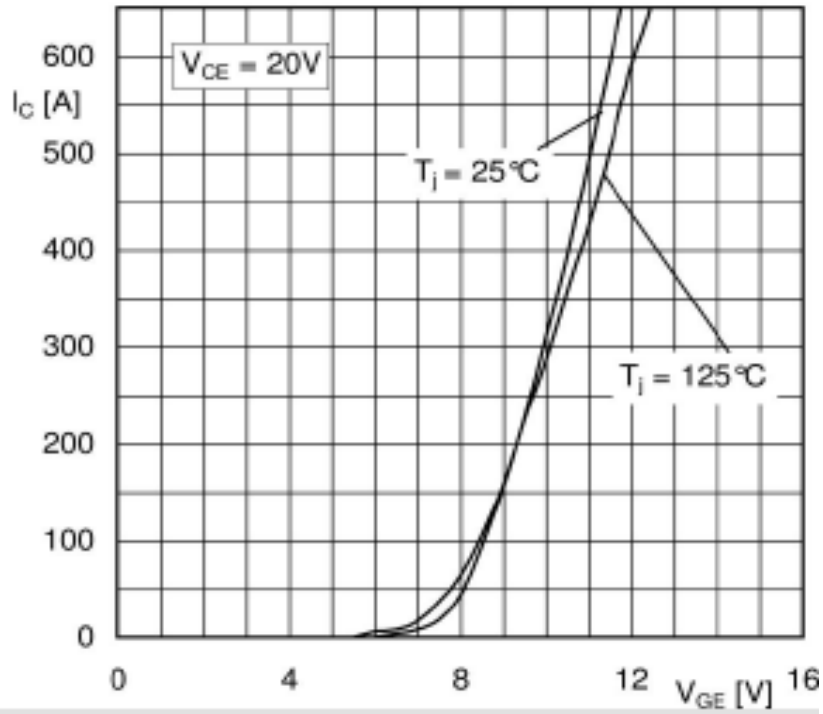
Typ. output characteristic, inclusive $R_{CC'+EE'}$



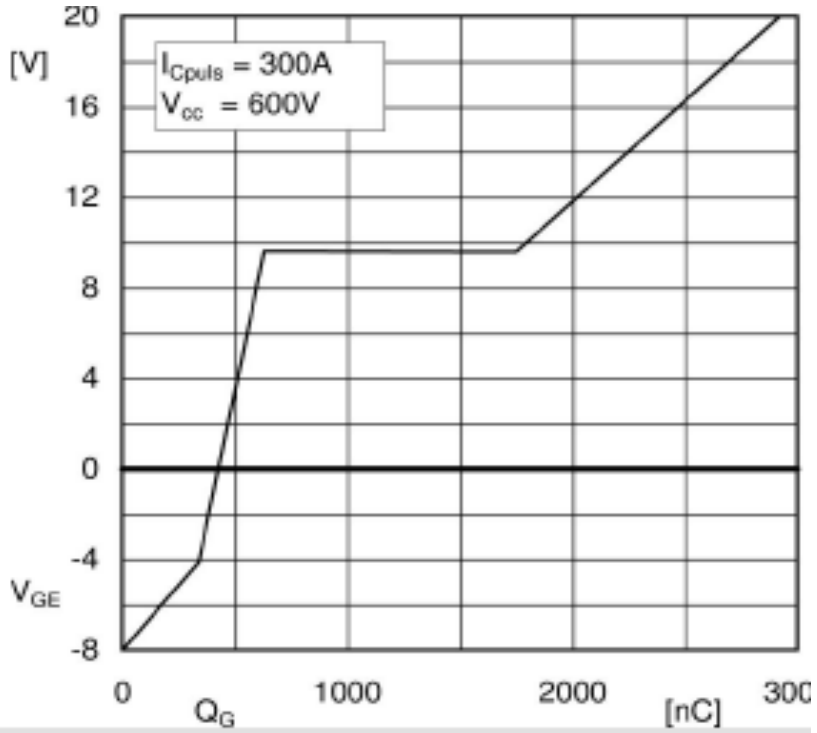
Typ. turn-on /-off energy = f (I_C)



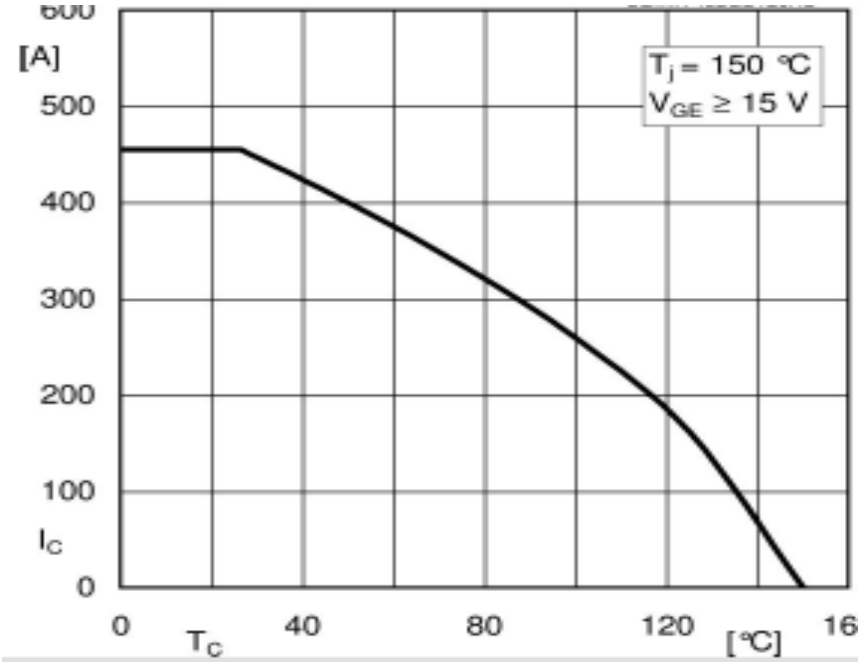
Typ. turn-on /-off energy = f (R_G)



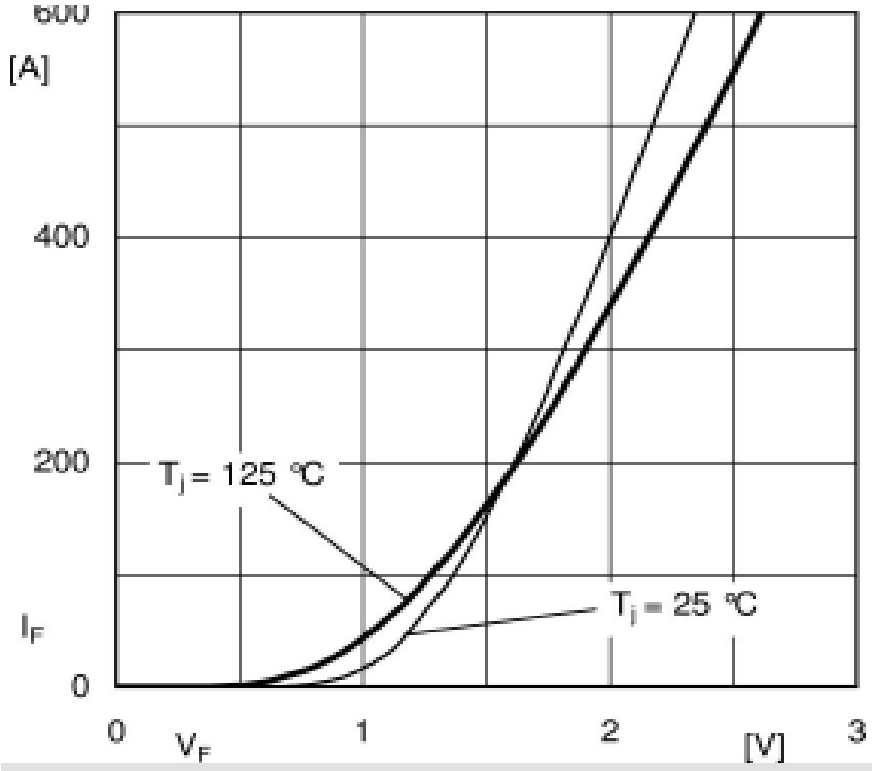
Typ. transfer characteristic



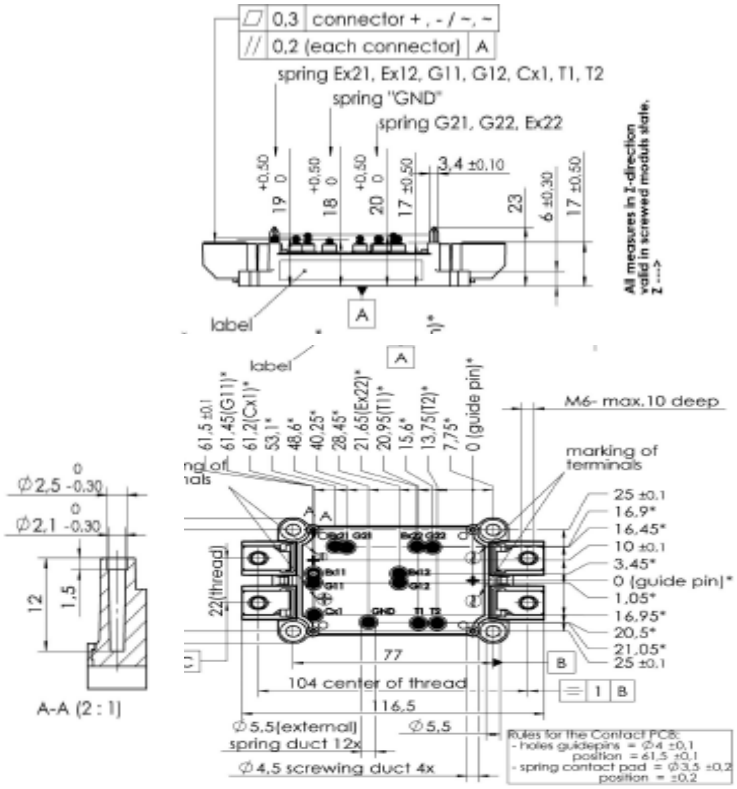
Typ. gate charge characteristic

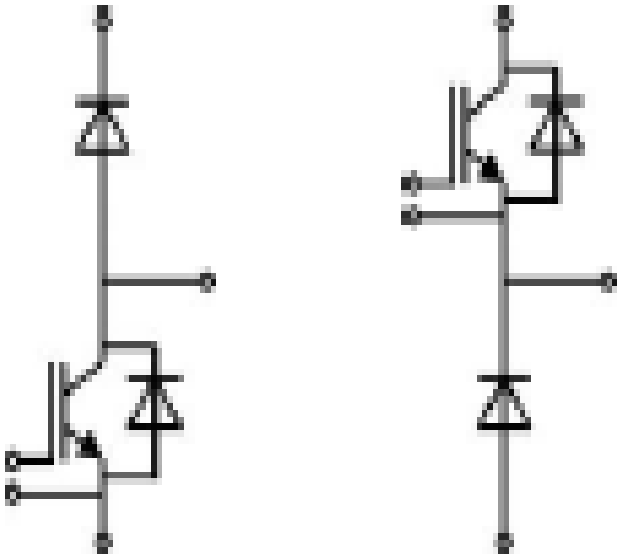


Rated current vs. temperature $I_C = f(T_C)$



Typ. CAL diode forward charact., incl. $R_{CC'+EE'}$





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CIRCUIT DIAGRAM