# SML100HB06

Attributes:
-aerospace build standard
-high reliability
-lightweight
-metal matrix base plate
-AlN isolation

## Maximum rated values/ Electrical Properties

| | | | | |
|---|---|---|---|---|
| Collector-emitter Voltage | | $V_{ces}$ | 600 | V |
| DC Collector Current | Tc=75C<br>Tc=25C | $I_c$, nom<br>Ic | 100<br>130 | A |
| Repetitive peak Collector Current | tp=1msec,Tc=75C | $I_{crm}$ | 200 | A |
| Total PowerDissipation | Tc=25C | $P_{tot}$ | 340 | W |
| Gate-emitter peak voltage | | $V_{ges}$ | +/-20 | V |
| DC Forward Diode Current | | $I_f$ | 100 | A |
| Repetitive Peak Forward Current | tp=1msec | $I_{frm}$ | 200 | A |
| $I^2t$ value per diode | Vr=0V, tp=10msec, Tvj=125C | $I^2_t$ | 1250 | $A^2sec$ |
| Isolation test voltage | RMS, 50Hz, t=1min | $V_{isol}$ | 2500 | V |

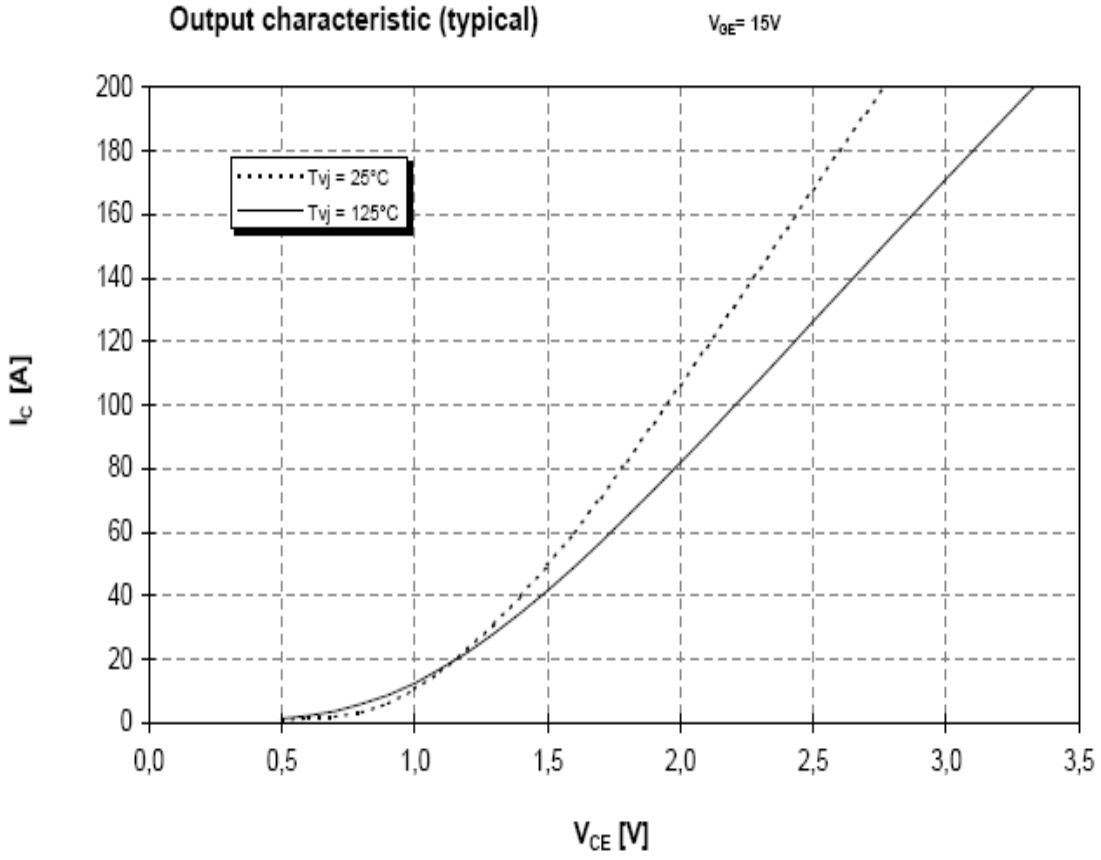
| | | | | | | |
|---|---|---|---|---|---|---|
| Collector-emitter saturation voltage | Ic=75A,Vge=15V, Tc=25C<br>Ic=75A,Vge=15V,Tc=125C | $V_{ce(sat)}$ | | 1.95<br>2.2 | 2.45 | V |
| Gate Threshold voltage | Vce=Vge, Tvj=25C | $V_{ge(th)}$ | 4.5 | 5.5 | 6.5 | V |
| Input capacitance | f=1MHz,Tvj=25C,Vce=25V, Vge=0V | $C_{ies}$ | | 4.3 | | nF |
| Reverse transfer Capacitance | f=1MHz,Tvj=25C,Vce=25V, Vge=0V | Cres | | 0.4 | | nF |
| Collector emitter cut off current | Vce=600V,Vge=0V,Tvj=25C<br>Vce=600V,Vge=0V,Tvj=125C | $I_{ces}$ | | 1<br>1 | 500 | µA |
| Gate emitter cut off current | Vce=0V,Vge=20V,Tvj=25C | $I_{ges}$ | | | 400 | µA |

| | | | | | | |
|---|---|---|---|---|---|---|
| Turn on delay time | Ic=100A, Vcc=300V<br>Vge=+/15V,Rg=2.2Ω,Tvj=25C<br>Vge=+/-15V,Rg=2.2Ω,Tvj=125C | $t_{d,on}$ | | 25<br>26 | | nsec<br>nsec |
| Rise time | Ic=100A, Vcc=300V<br>Vge=+/-15V,Rg=2.2Ω,Tvj=25C<br>Vge=+/-15V,Rg=2.2Ω,Tvj=125C | tr | | 10<br>11 | | nsec<br>nsec |
| Turn off delay time | Ic=100A, Vcc=300V<br>Vge=+/-15V,Rg=2.2Ω,Tvj=25C<br>Vge=+/-15V,Rg=2.2Ω,Tvj=125C | td,off | | 130<br>150 | | nsec<br>nsec |
| Fall time | Ic=100A, Vcc=300V<br>Vge=+/-15V,Rg=2.2Ω,Tvj=25C<br>Vge=+/-15V,Rg=2.2Ω,Tvj=125C | tf | | 20<br>30 | | nsec<br>nsec |
| Turn energy loss per pulse | Ic=75A,Vce=300V,Vge=15V<br>Rge=2.7Ω,Tvj=125C,L=35nH | Eon | | 1.0 | | mJ |
| Turn off energy loss per pulse | Ic=75A,Vce=300V, Vge=15V<br>Rge=Ω,Tvj=125C,L=30nH | Eoff | | 2.9 | | mJ |
| SC Data | tp≤10µsec, Vge≤15V<br>Tvj≤125C,Vcc=360V,Vce(max)-Vces-Lσdi/dT | Isc | | 450 | | A |
| Stray Module inductance | | Lσce | | 40 | | nH |
| Terminal-chip resistance | | Rc | | 1.0 | | mΩ |

## Diode characteristics

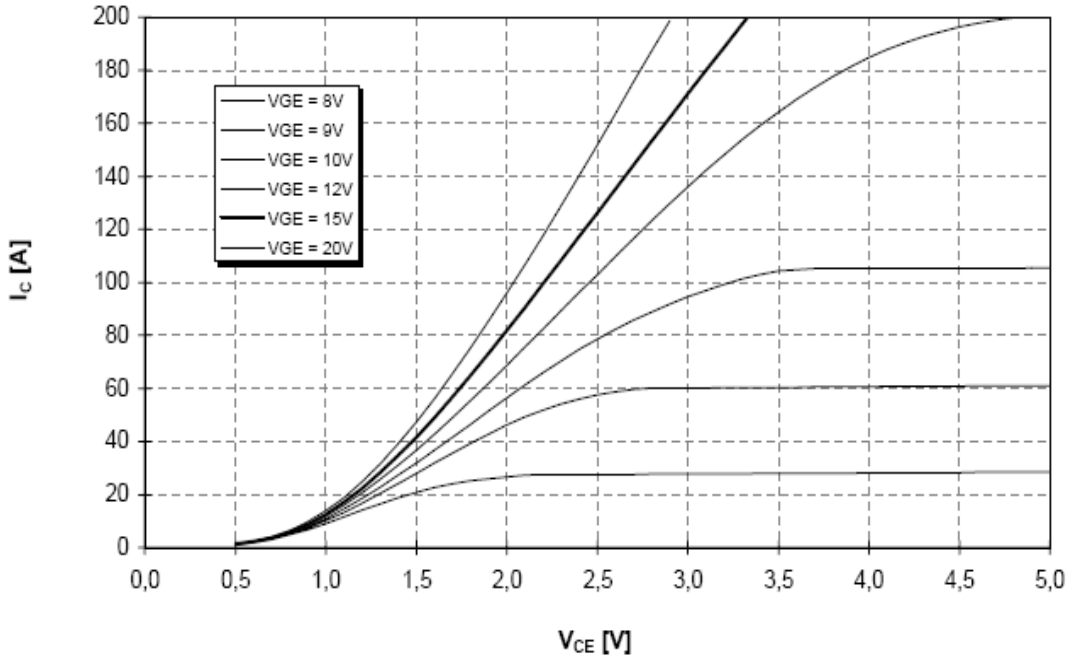
| | | | | | | |
|---|---|---|---|---|---|---|
| Forward voltage | Ic=75A,Vge=0V, Tc=25C<br>Ic=75A,Vge=0V, Tc=125C | $V_f$ | | 1.25<br>1.2 | 1.6 | V |
| Peak reverse recovery current | If=75A, -di/dt=3000A/µsec<br>Vce=300V,Vge=-10V,Tvj=25C<br>Vce=300V,Vge=-10V,Tvj=125C | $I_{rm}$ | | 150<br>180 | | A |
| Recovered charge | If=75A, -di/dt=3000A/µsec<br>Vce=600V,Vge=-10V,Tvj=25C<br>Vce=600V,Vge=-10V,Tvj=125C | $Q_r$ | | 7.7<br>13 | | µC |
| Reverse recovery energy | If=75A, -di/dt=3000A/µsec<br>Vce=600V,Vge=-10V,Tvj=25C<br>Vce=600V,Vge=-10V,Tvj=125C | $E_{rec}$ | | <br>3.2 | | mJ<br>mJ |

| Thermal Properties | | | Min | Typ | Max | |
|---|---|---|---|---|---|---|
| Thermal resistance junction to case | Igbt<br>Diode | $R_{\theta J-C}$ | | | 0.37<br>0.67 | K/W |
| Thermal resistance case to heatsink | | $R_{\theta C-hs}$ | | 0.03 | | K/W |
| Maximum junction temperature | | Tvj | | | 150 | C |
| Maximum operating temperature | | Top | -40 | | 125 | C |
| Storage Temperature | | Tstg | -40 | | 125 | C |



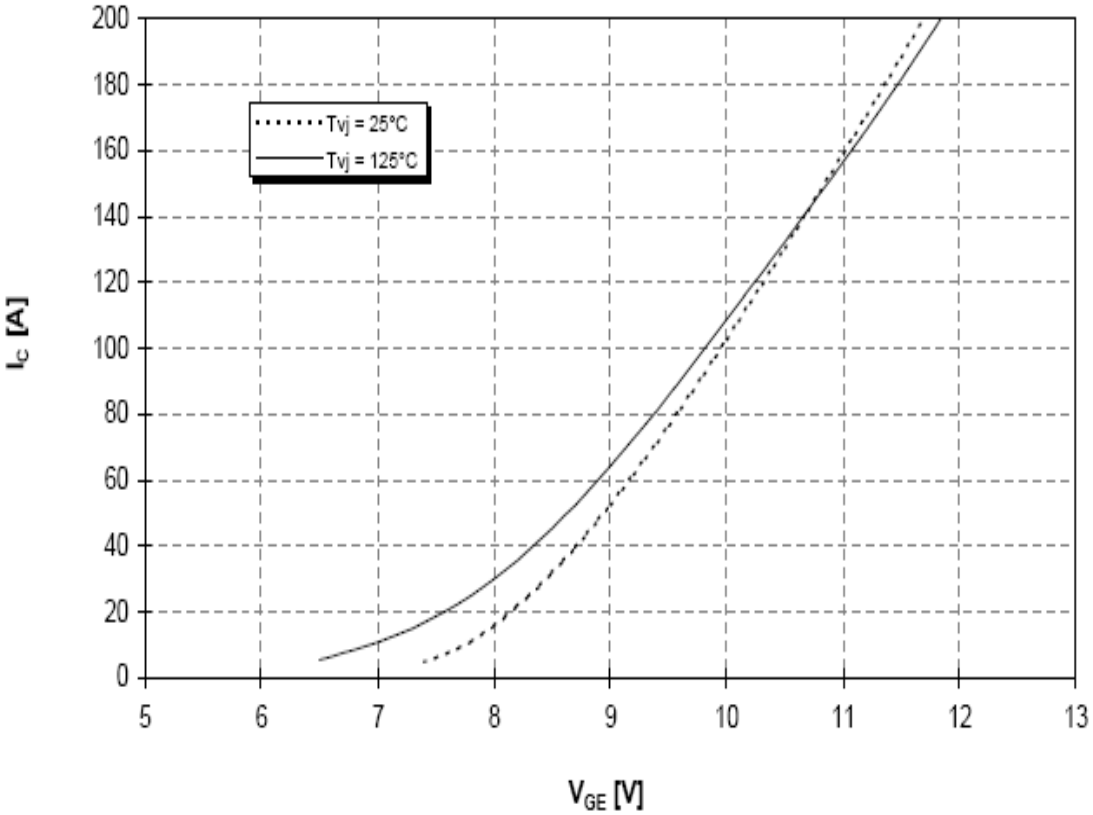
## Output characteristic (typical)

$T_{vj}$= 125°C

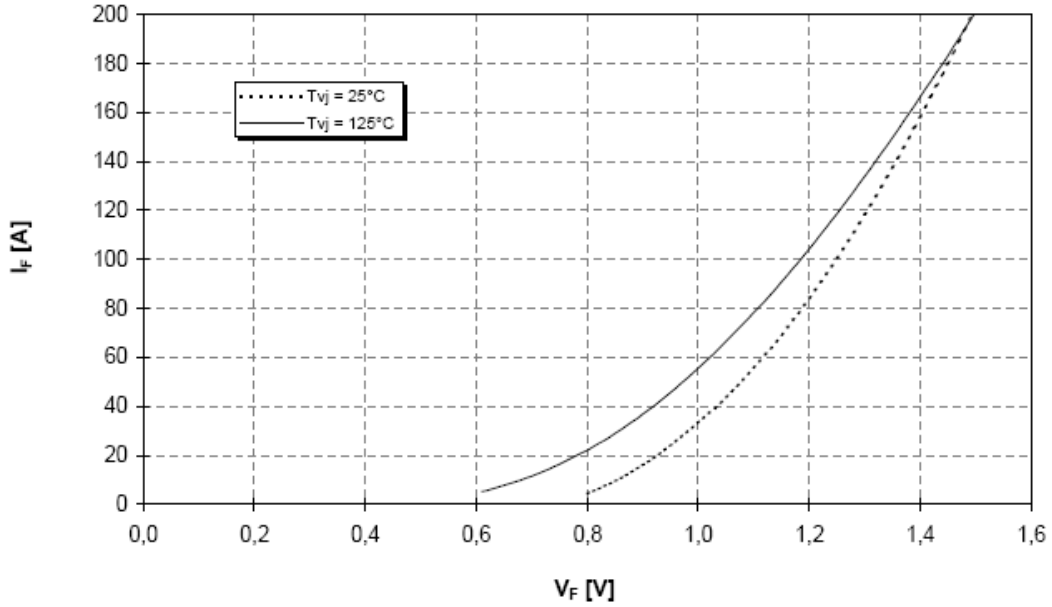



## Transfer characteristic (typical)

$V_{CE}$= 20V

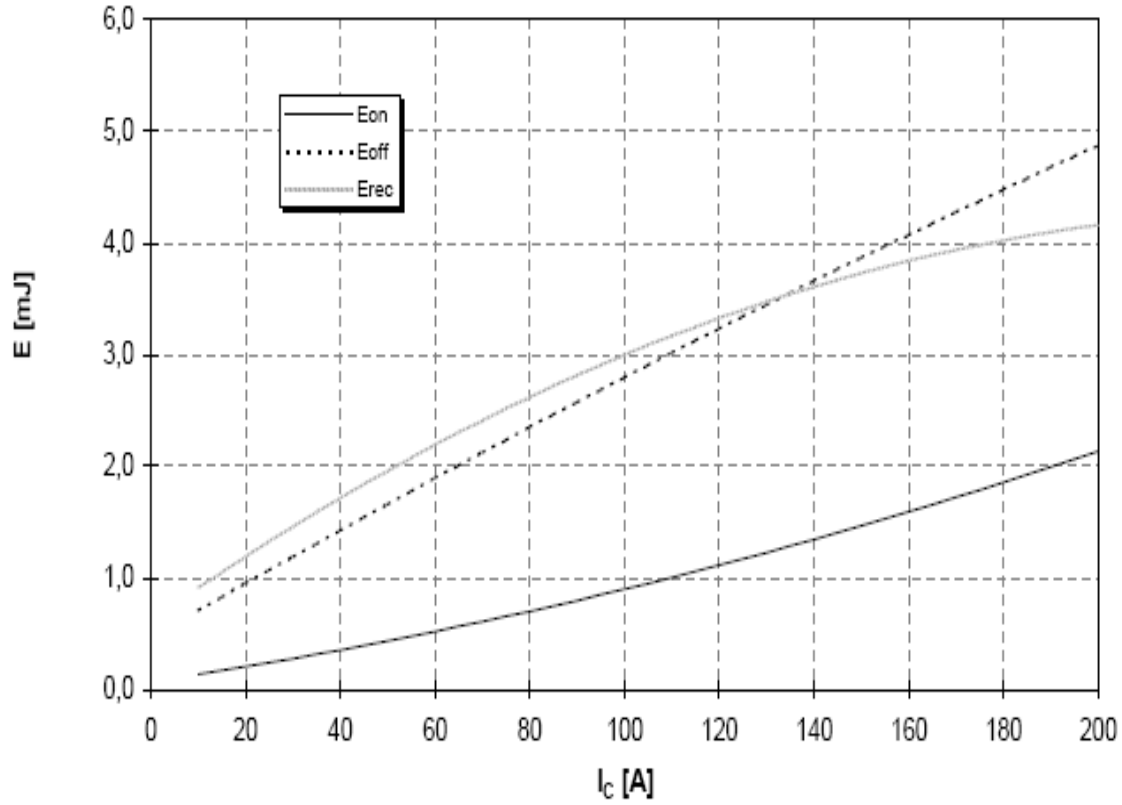


**Forward characteristic of inverse diode (typical)**



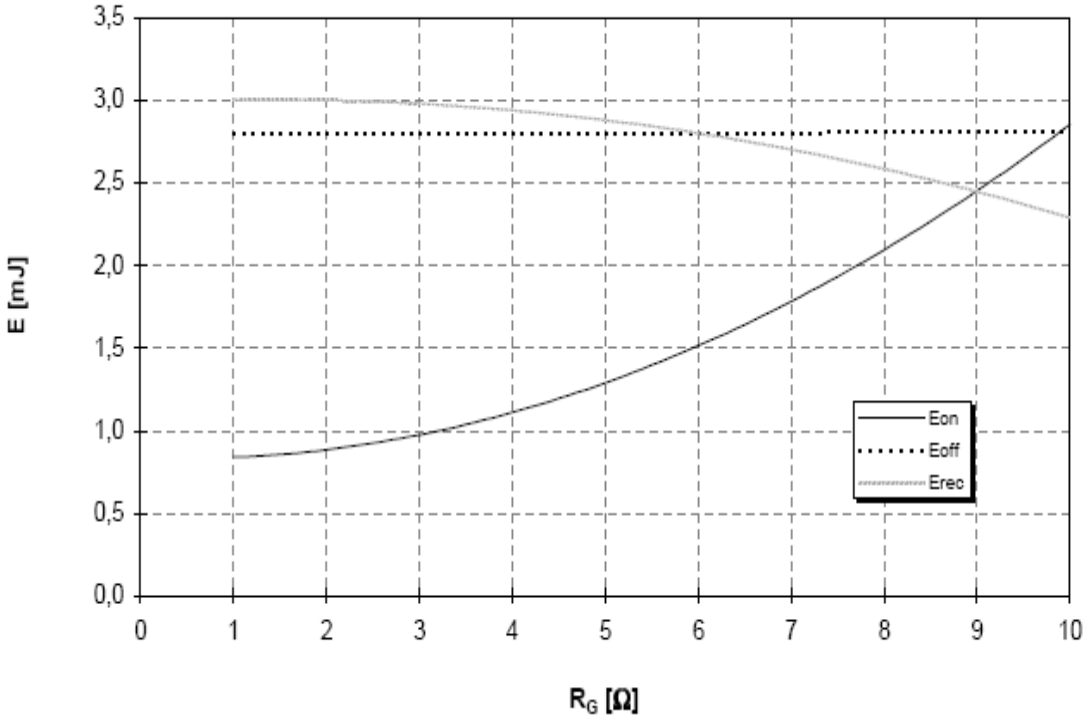

**Switching losses (typical)**

$R_{G,on}$= 2,2Ω, $R_{G,off}$= 2,2Ω, $V_{CC}$= 300V, $T_{vj}$= 125°C



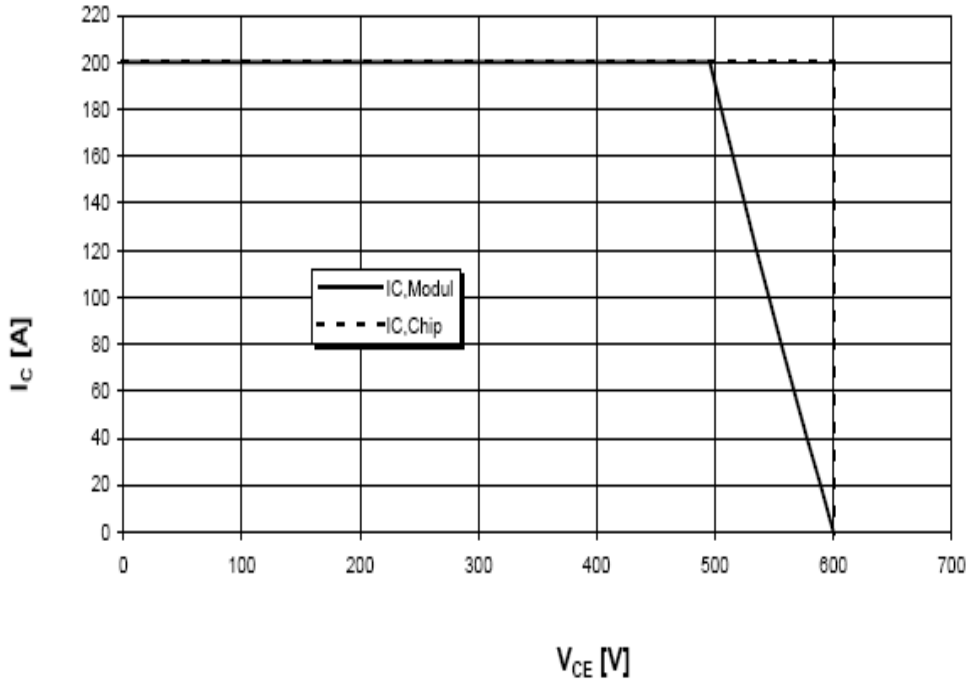
## Switching losses (typical)

$I_C$= 100A , $V_{CC}$= 300V , $T_{vj}$ = 125°C




## Reverse bias safe operation area (RBSOA)

$V_{GE}$= +15V, $R_{G,off}$= 2,2Ω, $T_{vj}$= 125°C



## Package outline / Circuit diagram