

SML75HB06

Attributes:

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


**Maximum rated values/
Electrical Properties**

Collector-emitter Voltage		$V_{ce(s)}$	600	V
DC Collector Current	$T_c=75C$ $T_c=25C$	$I_{c, nom}$ I_c	75 100	A
Repetitive peak Collector Current	$t_p=1msec, T_c=75C$	I_{crm}	150	A
Total Power Dissipation	$T_c=25C$	P_{tot}	260	W
Gate-emitter peak voltage		V_{ges}	+/-20	V
DC Forward Diode Current		I_f	75	A
Repetitive Peak Forward Current	$t_p=1msec$	I_{frm}	150	A
I^2t value per diode	$V_r=0V, t_p=10msec,$ $T_vj=125C$	I_t^2	500	A^2sec
Isolation test voltage	RMS, 50Hz, $t=1min$	V_{isol}	2500	V

Collector-emitter saturation voltage	$I_c=75A, V_{ge}=15V, T_c=25C$ $I_c=75A, V_{ge}=15V, T_c=125C$	$V_{ce(sat)}$		1.95 2.2	2.45	V
Gate Threshold voltage	$V_{ce}=V_{ge}, T_{vj}=25C$	$V_{ge(th)}$	4.5	5.5	6.5	V
Input capacitance	$f=1MHz, T_{vj}=25C, V_{ce}=25V,$ $V_{ge}=0V$	C_{ies}		3.2		nF
Reverse transfer Capacitance	$f=1MHz, T_{vj}=25C, V_{ce}=25V,$ $V_{ge}=0V$	C_{res}		0.3		nF
Collector emitter cut off current	$V_{ce}=600V, V_{ge}=0V, T_{vj}=25C$ $V_{ce}=600V, V_{ge}=0V, T_{vj}=125C$	I_{ces}		1 1	500	μA
Gate emitter cut off current	$V_{ce}=0V, V_{ge}=20V, T_{vj}=25C$	I_{ges}			400	μA



Turn on delay time	Ic=75A, Vcc=300V Vge=+/15V,Rg=3Ω,Tvj=25C Vge=+/-15V,Rg=3Ω,Tvj=125C	t _{d,on}		63 65		nsec nsec
Rise time	Ic=75A, Vcc=300V Vge=+/-15V,Rg=3Ω,Tvj=25C Vge=+/-15V,Rg=3Ω,Tvj=125C	t _r		22 1025		nsec nsec
Turn off delay time	Ic=75A, Vcc=300V Vge=+/-15V,Rg=3Ω,Tvj=25C Vge=+/-15V,Rg=3Ω,Tvj=125C	t _{d,off}		155 170		nsec nsec
Fall time	Ic=75A, Vcc=300V Vge=+/-15V,Rg=3Ω,Tvj=25C Vge=+/-15V,Rg=3Ω,Tvj=125C	t _f		20 35		nsec nsec
Turn energy loss per pulse	Ic=75A, Vce=300V, Vge=15V Rge=2.7Ω, Tvj=125C, L=35nH	E _{on}		0.7		mJ
Turn off energy loss per pulse	Ic=75A, Vce=300V, Vge=15V Rge=Ω, Tvj=125C, L=30nH	E _{off}		2.4		mJ
SC Data	tp≤10μsec, Vge≤15V Tvj≤125C, Vcc=360V, Vce(max)- Vces-Lσdi/dT	I _{sc}		340		A
Stray Module inductance		L _{σce}		40		nH
Terminal-chip resistance		R _c		1.2		mΩ

Diode characteristics

Forward voltage	Ic=75A, Vge=0V, Tc=25C Ic=75A, Vge=0V, Tc=125C	V _f		1.25 1.2	1.6	V
Peak reverse recovery current	If=75A, -di/dt=3000A/μsec Vce=300V, Vge=-10V, Tvj=25C Vce=300V, Vge=-10V, Tvj=125C	I _{rm}		95 115		A
Recovered charge	If=75A, -di/dt=3000A/μsec Vce=600V, Vge=-10V, Tvj=25C Vce=600V, Vge=-10V, Tvj=125C	Q _r		5.1 7.9		μC
Reverse recovery energy	If=75A, -di/dt=3000A/μsec Vce=600V, Vge=-10V, Tvj=25C Vce=600V, Vge=-10V, Tvj=125C	E _{rec}		. 2.3		mJ mJ

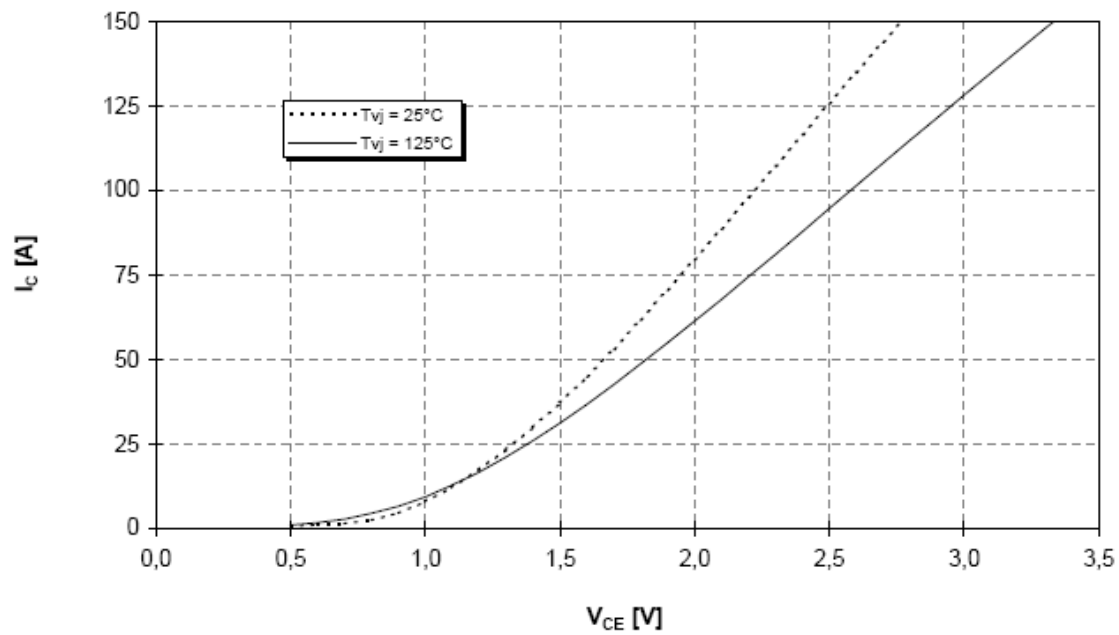


Thermal Properties

			Min	Typ	Max	
Thermal resistance junction to case	Igibt Diode	$R_{\theta J-C}$			0.48 0.89	K/W
Thermal resistance case to heatsink		$R_{\theta C-HS}$		0.03		K/W
Maximum junction temperature		T_{vj}			150	C
Maximum operating temperature		T_{op}	-55		125	C
Storage Temperature		T_{stg}	-55		125	C

Output characteristic (typical)

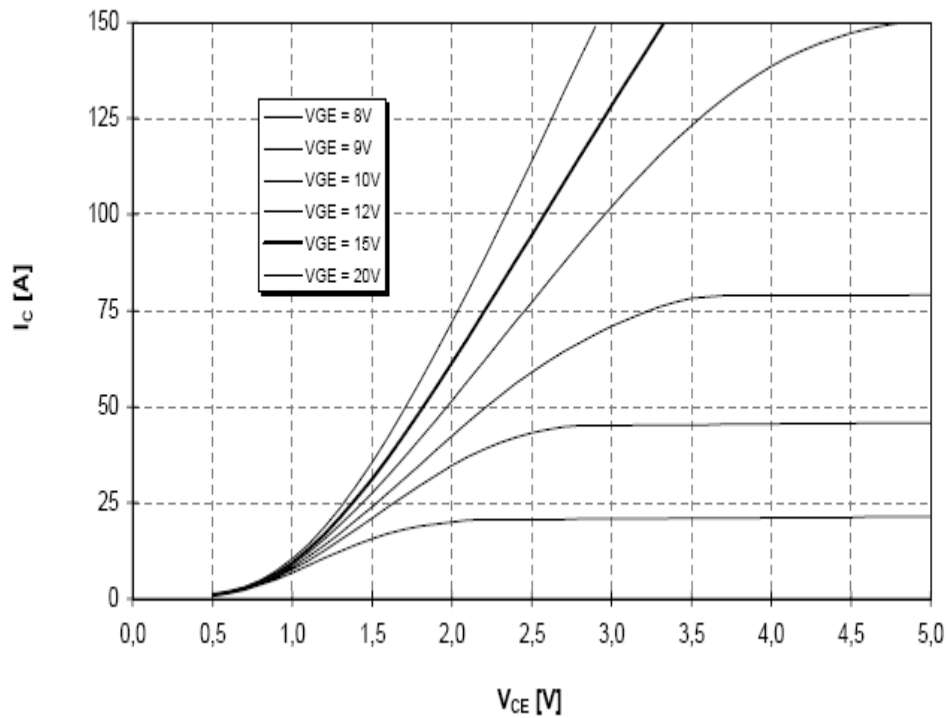
$V_{GE} = 15V$





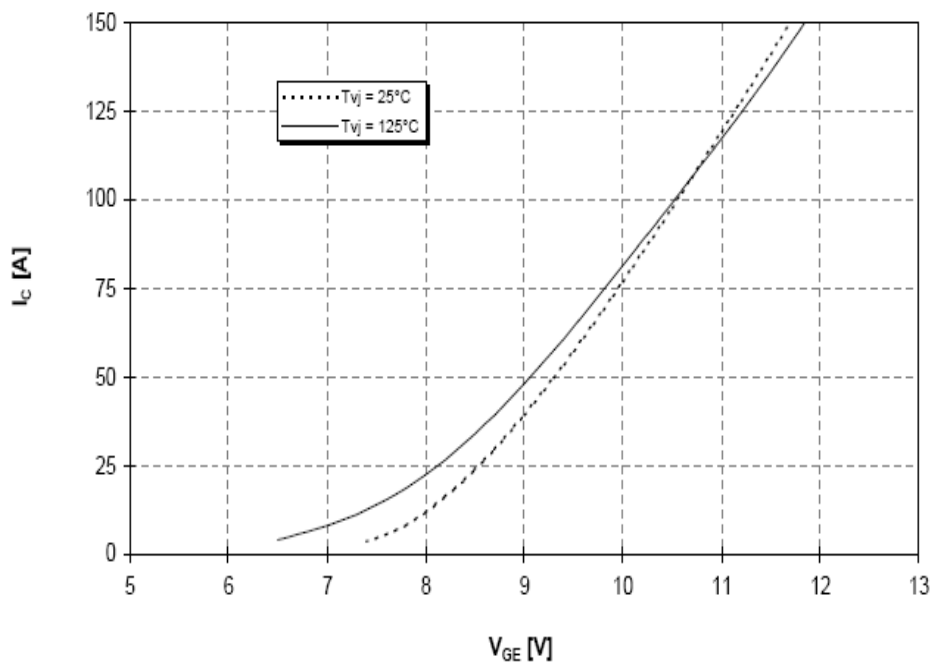
Output characteristic (typical)

$T_{vj} = 125^{\circ}\text{C}$



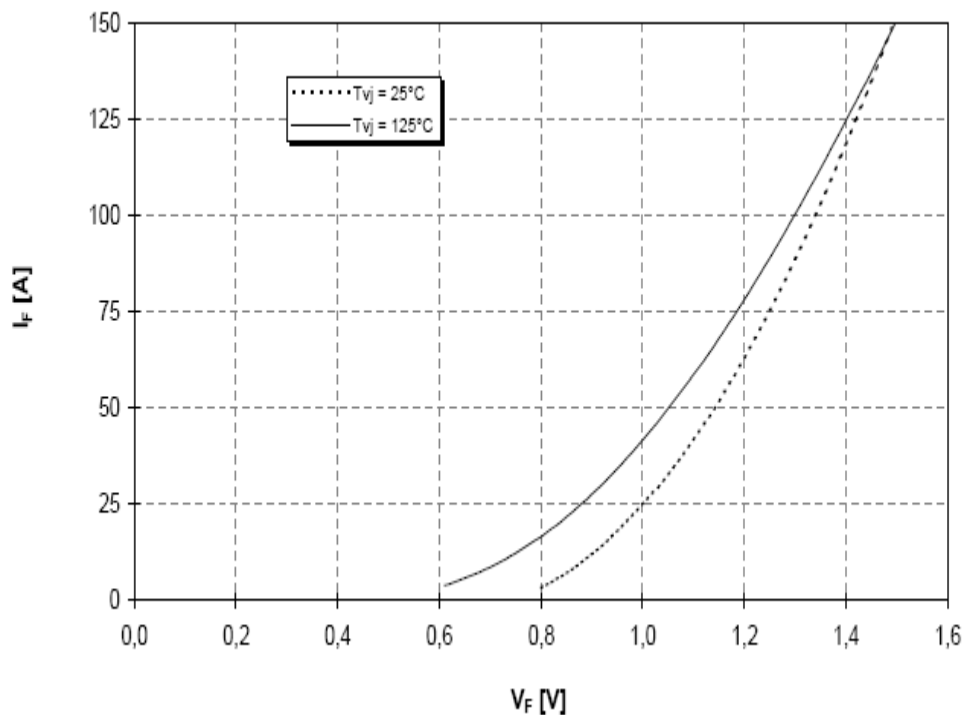
Transfer characteristic (typical)

$V_{ce} = 20V$



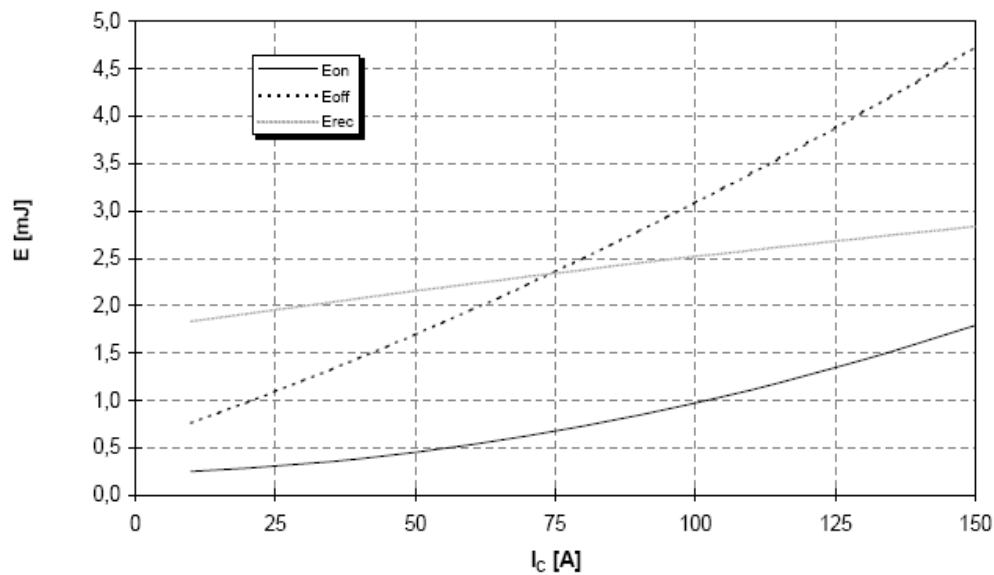


Forward characteristic of inverse diode (typical)



Switching losses (typical)

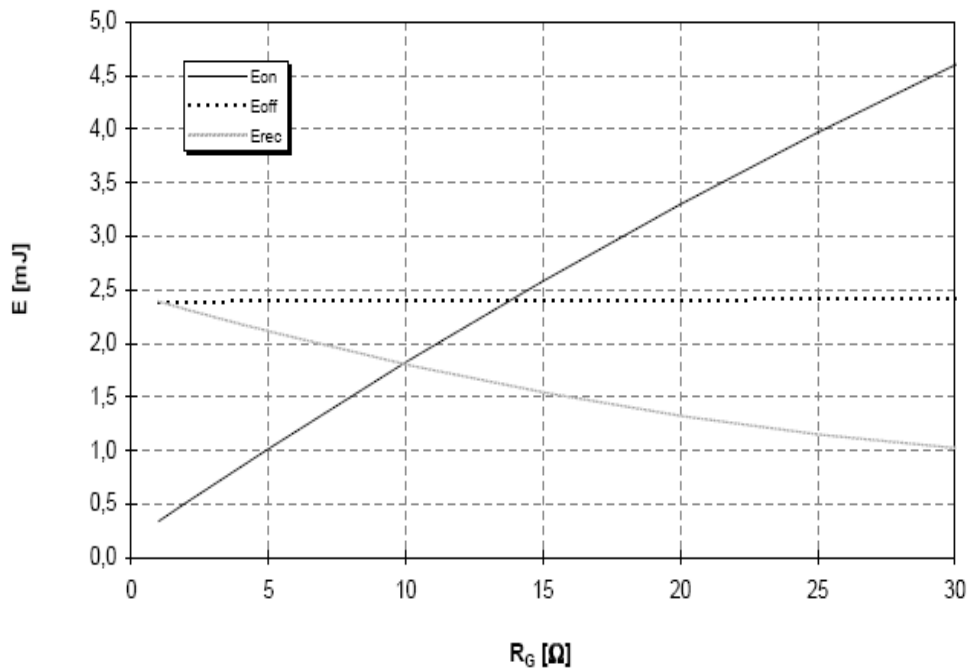
$R_{\theta,on} = 3,0\Omega$, $R_{\theta,off} = 3,0\Omega$, $V_{CC} = 300\text{V}$, $T_{vj} = 125^\circ\text{C}$





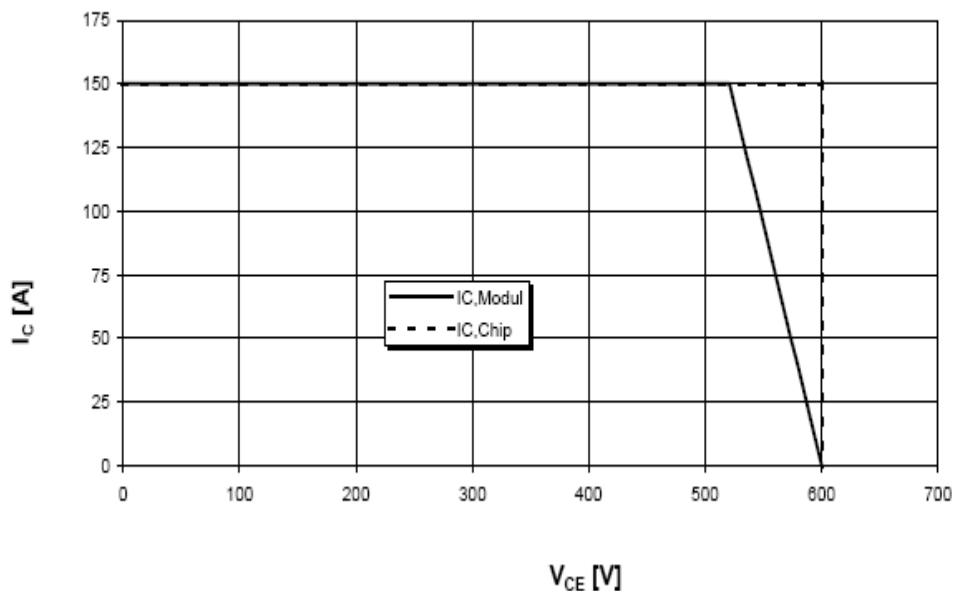
Switching losses (typical)

$I_C = 75\text{A}$, $V_{CE} = 300\text{V}$, $T_V = 125^\circ\text{C}$



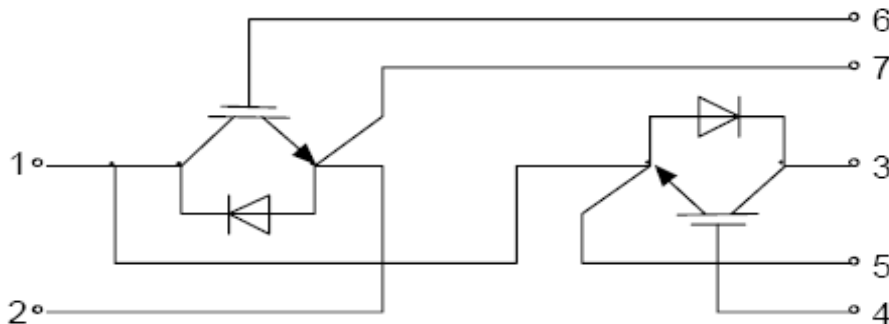
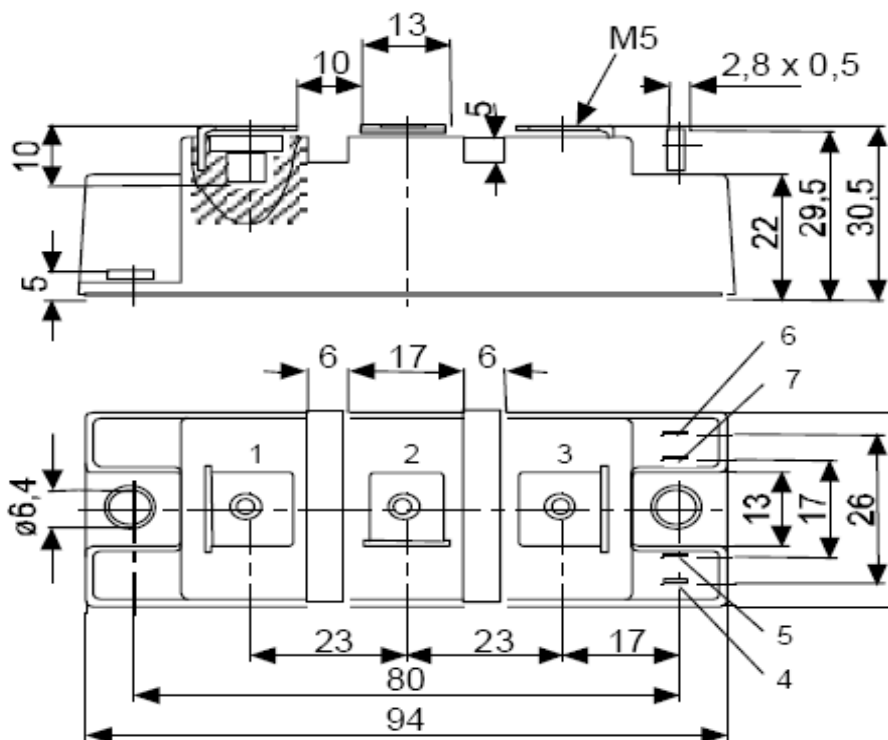
Reverse bias safe operation area (RBSOA)

$V_{GE} = +15\text{V}$, $R_{G,off} = 3,0\Omega$, $T_V = 125^\circ\text{C}$





Package outline / Circuit diagram



CIRCUIT DIAGRAM

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders