

SML400HB01MF

Attributes:

- -aerospace build standard
- -high reliability
- -lightweight
- -metal matrix base plate
- -AIN isolation
- -Mosfet module



Maximum rated values/Electrical Properties

Source-drain voltage V _{DSS}	$ \begin{array}{c c} Tj = 25C \text{ to } 175C & V_{DSS} \\ Rgs = 1M\Omega & \end{array} $		100	V
DC Collector Current I _{D25}	Tc=25C Tc=25C,Tvj=175C	I _c , nom Ic	400 400	A
Repetitive peak Drain Current	tp=1msec,Tc=80C	I_{crm}	600	Α
Total Power Dissipation	Te=25C	P_{tot}	1700	W
Gate-emitter peak voltage	Continuous Transient	V_{GS}	+/-20 =/-30	V V
Repetitive Peak Forward Current	tp=1msec	${ m I_{frm}}$	600	A
Isolation voltage	RMS, 50Hz, t=1min	V_{isol}	2500	V

			MIN	TYP	MAX	
Drain-source breakdown voltage	$I_D=250\mu A, V_{GS}=0V,$ Tc=25C	$\mathrm{BV}_{\mathrm{DSS}}$	100			V
Gate Threshold voltage	I_D =8mA, V_{DS} = V_{GS} , Tvj =25C	Vge _(th)	3.0		5	V
C _{lee} C _{oee}	f=1MHz,Tvj=25C,Vgs=0V,V _{DS} =0V			15200 5800 1720		pF pF pF
C,,,, Q _{g(on)} Q _{ge}	Tvj=25C,V _{DS} =0.5V _{DSS} ,ID=0.	470 100 270		nC nC nC		
Gate-source leakage current	V _{GS} =+/-20V, V _{GS} =0V,Tvj=25C	I_{GSS}		1	+/-200	nA
Drain source leakage current	V _{DS} =V _{GS} =20V, Tvj=25C Tvj=150C Tvj=175C	$I_{ m DSS}$			25 1 5	μΑ mA mA

gfs	Vgs=10V, I _D =0.5I _{D25}		60	97	S
t _{d(on)} t _r t _{d(off)} t _r	Ic=120A,V _{DS} =0.5VDSS,V _{GS} =10 V Rge=3.3Ω,L=30nH Tvj=25C			50 60 150 90	ns ns Ns ns
Stray Module inductance		$L_{\sigma ce}$		30	nН
Terminal-chip resistance		R _c		1.0	mΩ

Source –Drain Diode characteristics

TYP MAX

DC Forward Diode Current Is	$T_c=25C V_{GS}=0V$	I_s		400	A
Repetitive forward current		Ism		800	A
	$I_{P}=I_{S}$, $V_{GS}=0V$ $t_{P}=300\mu sec$, duty cycle=2%	$ m V_{SD}$		1.5	V
Peak reverse recovery current	If=50A, -di/dt=100A/μsec V _R =50V,Vgs=0V,Tvj=25C	I_{rm}	12		A
Reverse recovery time	If=50A, -di/dt=100A/μsec Vr=50V,Vgs=0V,Tvj=25C	trr		300	ns
Recovered charge	If=50A, -di/dt=100A/µsec Vr=50V,Vgs=0V,Tvj=25C	Qrm	0.8		μС



Thermal Properties			Min	Typ	Max	
Thermal resistance junction to case	Igbt Diode	$R_{ heta J ext{-}C}$			0.09 0.11	K/W
Thermal resistance case to heatsink		$R_{ heta C ext{-}hs}$		0.03		K/W
Maximum junction temperature		Tvj			175	С
Maximum operating temperature		Тор	-55		175	С
Storage Temperature		Tstg	-55		175	С

Fig. 1. Output Characteristics @ 25°C 400 V_{GS} = 10∨ 300 ID - Amperes 87 200 100 6V 0 0.8 0.6 0.2 0.4 1 1.2 1.4 1.6 V_{DS} - Volts

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Fig. 2. Extended Output Characteristics @ 25°C

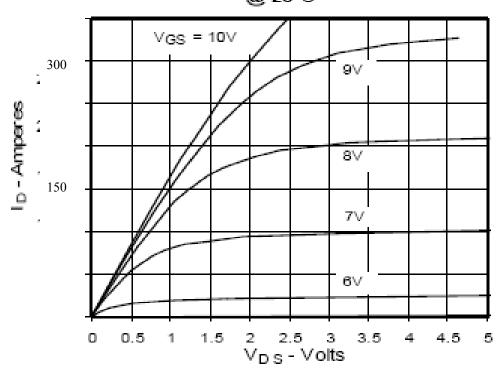


Fig. 3. Output Characteristics @ 150°C

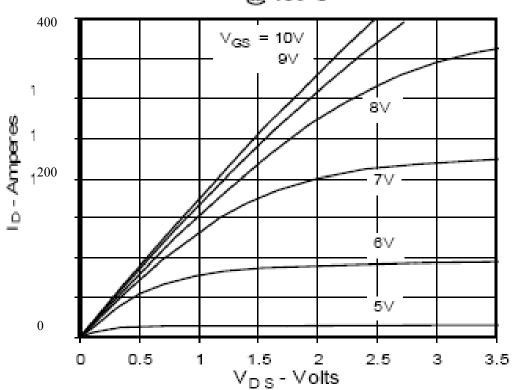




Fig. 4. R_{DS(on)} Normalized to 0.5 I_{D25} Value vs. Junction Temperature

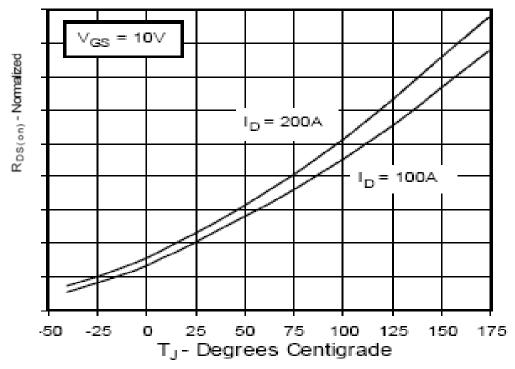


Fig. 5. R_{DS(on)} Normalized to 0.5 I_{D25} Value vs. Drain Current

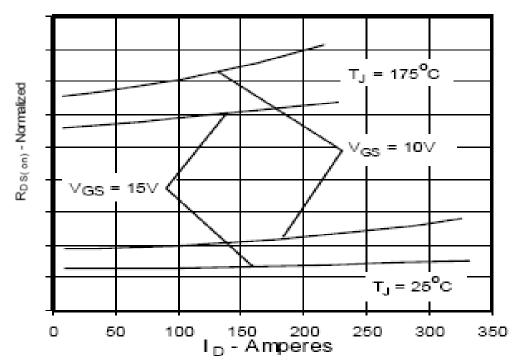


Fig. 6. Drain Current vs. Case
Temperature

160A

Section 25 50 75 100 125 150 175
T_C - Degrees Centigrade

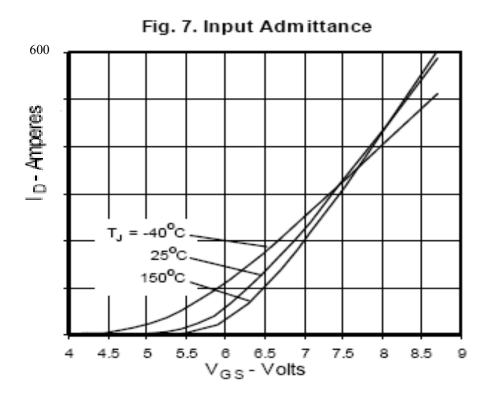


Fig. 8. Transconductance

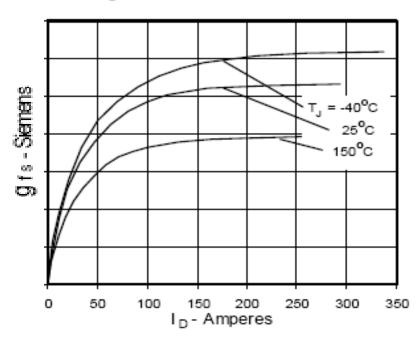


Fig. 9. Source Current vs. Source-To-Drain Voltage

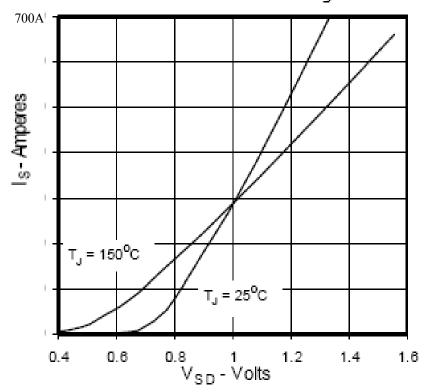




Fig. 10. Gate Charge 20 I_D = 100A I_G = 10mA 75 100 125 150 175 200 225 250 Q _G - nanoCoulombs 25

Fig. 11. Capacitance

