MG100HF12LVC1

RoHS COMPLIANT

IGBT Modules

VCES	1200V
IC	100A

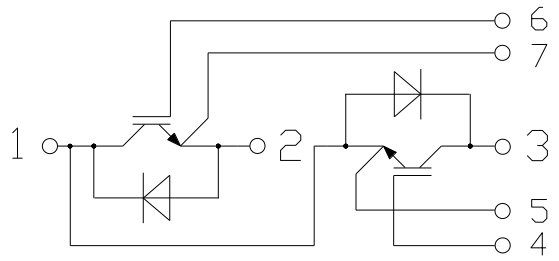
Applications

- Inverter for motor drive
- AC and DC servo drive amplifier
- UPS (Uninterruptible Power Supplies)
- Soft switching welding machine

Features

- Low Vce(sat) with Planner technology
- Vce(sat) with positive temperature coefficient
- Including fast & soft recovery anti-parallel FWD
- High short circuit capability(10us)
- Low inductance module structure

Circuit



● Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Collector-Emitter Voltage	V_{CES}	V_{GE}=0V, I_C =1mA, T_{vj}=25℃	1200	V
Continuous Collector Current	I_C	T_c=80℃	100	A
Peak Collector Current	I_{CRM}	Tp=1ms	200	A
Gate-Emitter Voltage	V_{GES}	T_{vj}=25℃	±20	V
Total Power Dissipation (IGBT-inverter)	P_{tot}	T_c=25℃ T_{vjmax}=150℃	625	W

● IGBT Characteristics

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Gate-emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}$, I_C =4mA,T_{vj}=25℃	5.0	5.8	6.5	V
Collector-Emitter Cut-off Current	I_{CES}	V_{CE}=1200V,V_{GE}=0V, T_{vj}=25℃			1.0	mA
		V_{CE}=1200V,V_{GE}=0V, T_{vj}=125℃			5.0	mA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	Ic=100A,V_{GE}=15V, T_{vj}=25℃		1.95	2.25	V
		Ic=100A,V_{GE}=15V, T_{vj}=125℃		2.15		V
Input Capacitance	C_{ies}	V_{CE}=25V,V_{GE} =0V, f=1MHz, T_{vj}=25℃		5.80		nF
Output Capacitance	C_{oes}			0.60		nF
Reverse Transfer Capacitance	C_{res}			0.40		nF
Internal Gate Resistance	Rgint			2.5		Ω
Turn-on Delay Time	$t_{d(on)}$	I_C =100 A V_{CE} = 600 V V_{GE} = ±15V R_G =5.1Ω T_{vj}=25℃		240		ns
Rise Time	t_r			55		ns
Turn-off Delay Ttime	$t_{d(off)}$			395		ns
Fall Time	t_f			178		ns
Energy Dissipation During Turn-on Time	E_{on}			4.1		mJ
Energy Dissipation During Turn-off Time	E_{off}			7.3		mJ
Turn-on Delay Time	$t_{d(on)}$	I_C =100 A V_{CE} = 600 V V_{GE} = ±15V R_G =5.1Ω T_{vj}=125℃		260		ns
Rise Time	t_r			68		ns
Turn-off Delay Time	$t_{d(off)}$			420		ns
Fall Time	t_f			280		ns
Energy Dissipation During Turn-on Time	E_{on}			5.3		mJ
Energy Dissipation During Turn-off Time	E_{off}			9.1		mJ
SC Data	Isc	T_p≤10us,V_{GE}=15V, T_{vj}=150℃,V_{cc}=600V, V_{CEM}≤1200V		700		A

● Diode Characteristics

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Diode DC Forward Current	I_F	T_c=80℃		100		A
Diode Peak Forward Current	I_{FRM}	I_{FRM}=2I_F		200		A
Forward Voltage	V_F	I_F=100A,T_{vj}=25℃		1.80		V
		I_F=100A,T_{vj}=125℃		1.85		V

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Recovered Charge	Q_{rr}	I_F =100 A V_R=600V -di$_F$/dt =2300A/us T_{vj}=25℃		4.5		uC
Peak Reverse Recovery Current	I_{rr}			80		A
Reverse Recovery Time	t_{rr}			85		ns
Reverse Recovery Energy	E_{rec}			2.5		mJ
Recovered Charge	Q_{rr}	I_F =100 A V_R=600V -di$_F$/dt =2300A/us T_{vj}=125℃		9.2		uC
Peak Reverse Recovery Current	I_{rr}			95		A
Reverse Recovery Time	t_{rr}			110		ns
Reverse Recovery Energy	E_{rec}			4.8		mJ

● Module Characteristics T_C=25°C unless otherwise specified

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Isolation voltage	V_{isol}	t=1min,f=50Hz	2500			V
Maximum Junction Temperature	T_{jmax}				150	℃
Operating Junction Temperature	$T_{vj\ op}$		-40		125	℃
Storage Temperature	T_{stg}		-40		125	℃
Junction-to Case	$R_{\theta jc}$	per IGBT-inverter			0.20	K/W
		per Diode-inverter			0.36	K/W
Case to Sink	$R_{\theta cs}$	Conductive grease applied		0.05		K/W
Module Electrodes Torque	M_t	Recommended(M5)	2.5		5.0	N·m
Module-to-Sink Torque	M_s	Recommended(M6)	3.0		5.0	N·m
Weight of Module	G			150		g

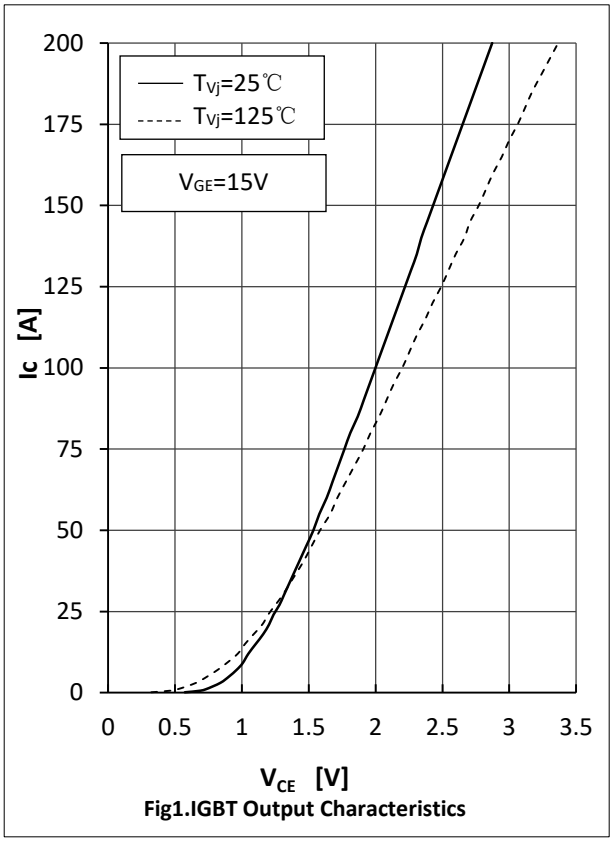


Fig1.IGBT Output Characteristics

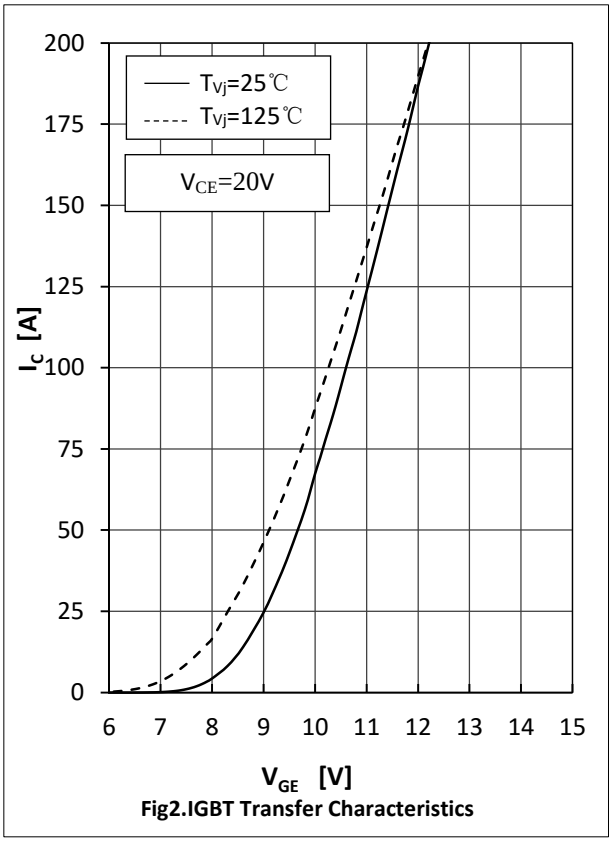


Fig2.IGBT Transfer Characteristics

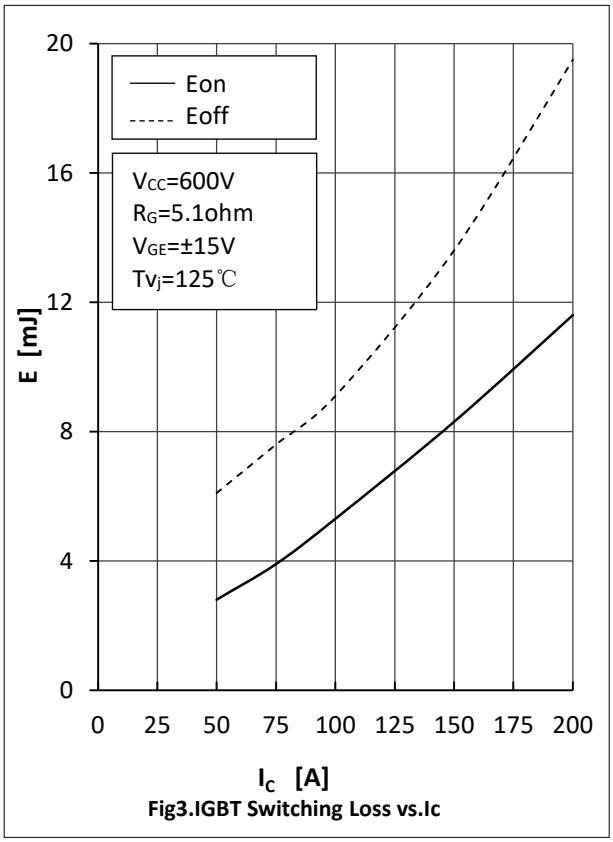


Fig3.IGBT Switching Loss vs.Ic

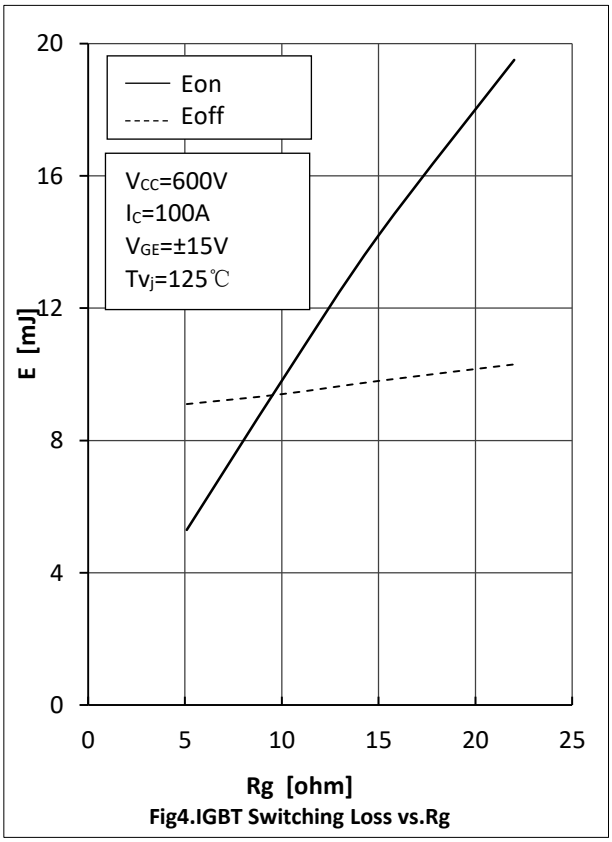


Fig4.IGBT Switching Loss vs.Rg

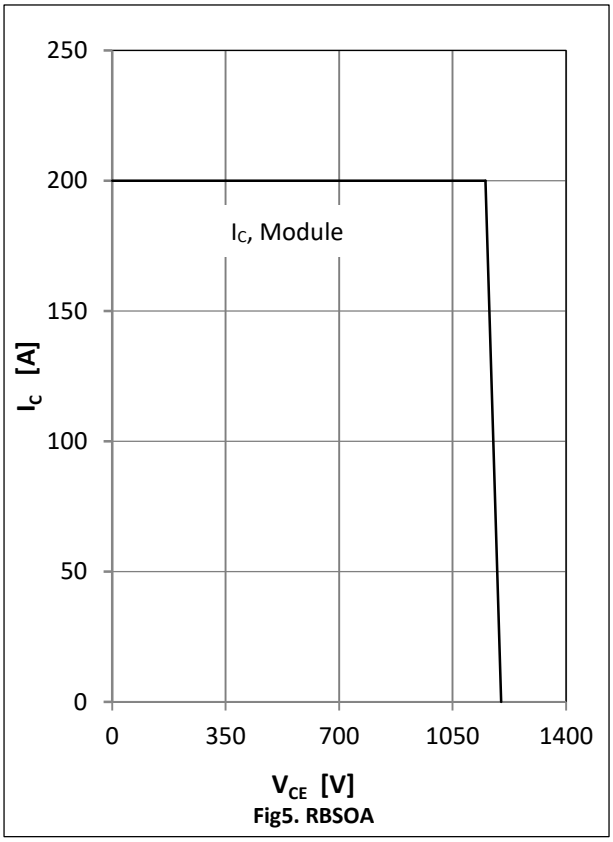


Fig5. RBSOA

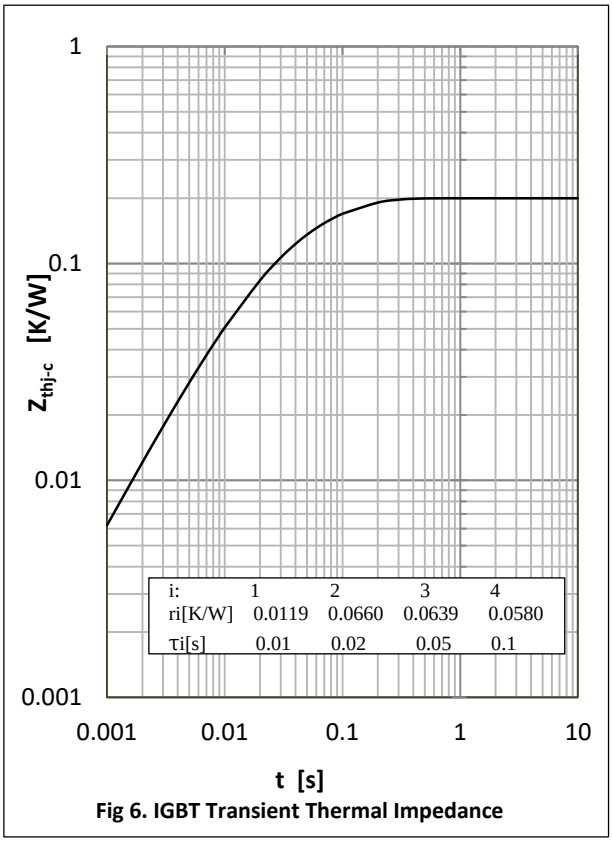


Fig 6. IGBT Transient Thermal Impedance

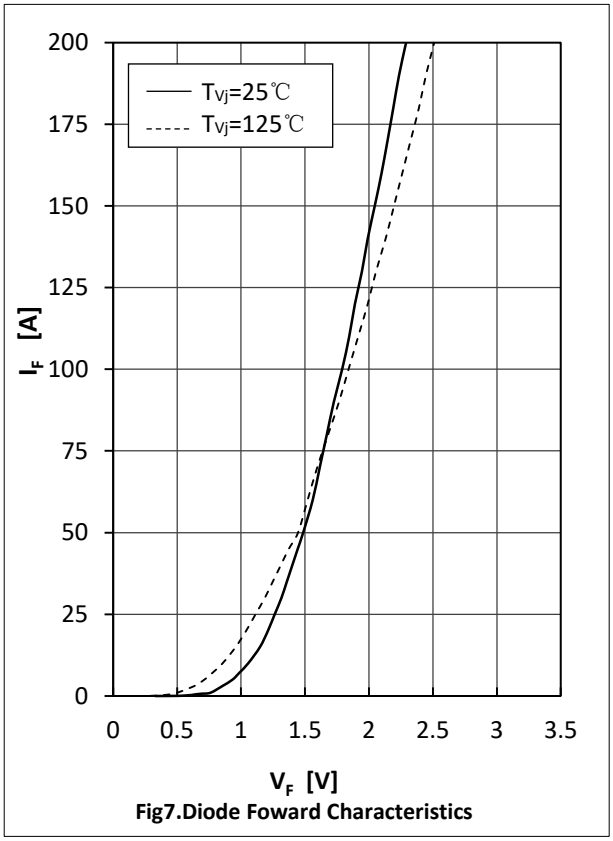


Fig7.Diode Foward Characteristics

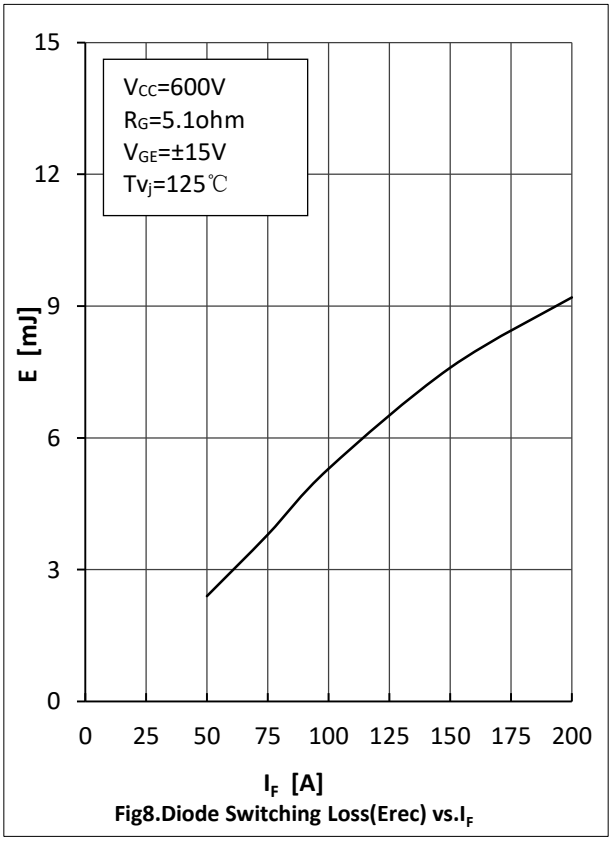


Fig8.Diode Switching Loss(Erec) vs.I_F

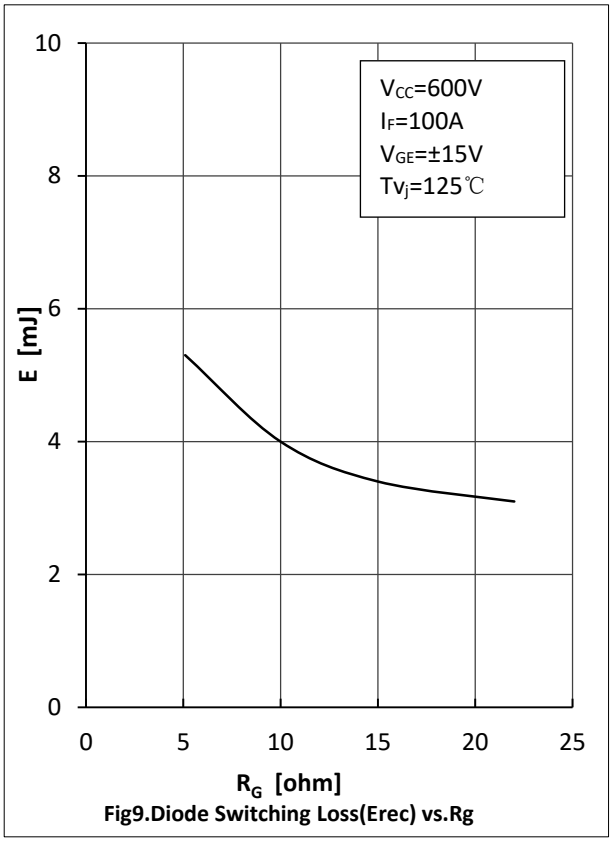


Fig9.Diode Switching Loss(Erec) vs.Rg

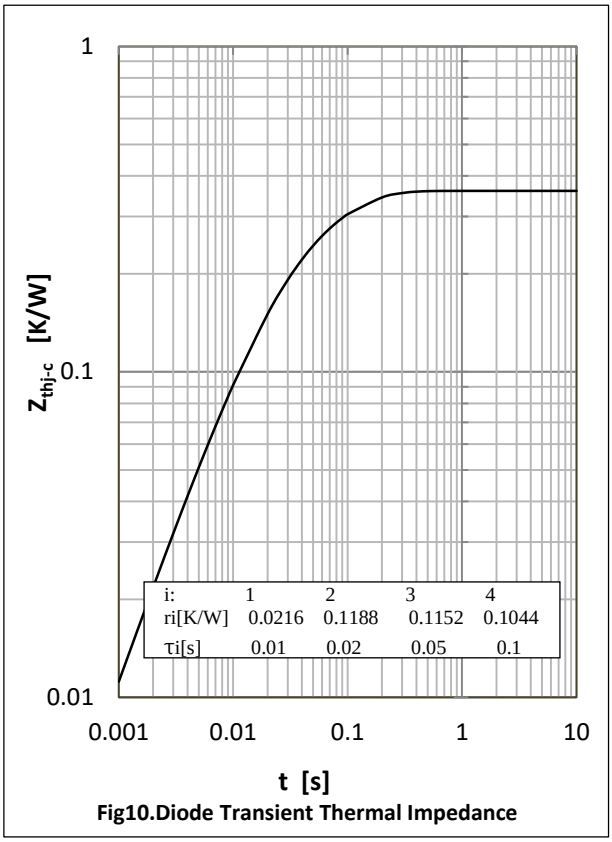
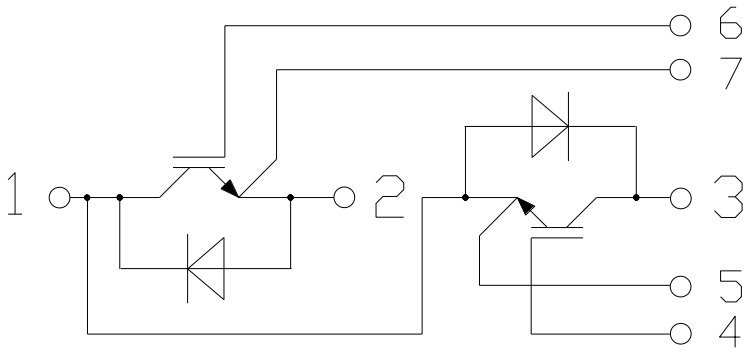


Fig10.Diode Transient Thermal Impedance

- **Circuit Diagram**



- **Package Dimensions**

Dimensions in Millimeters