

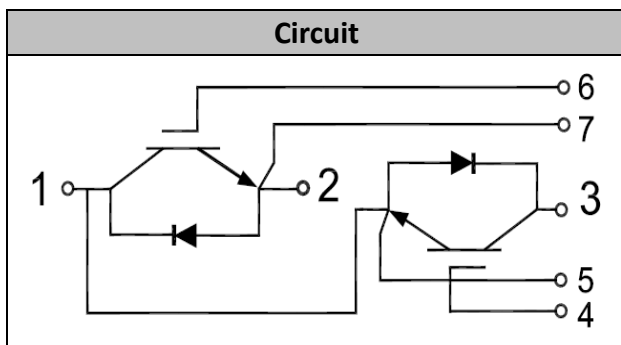


IGBT Modules

V_{CES} 1200V
 I_c 100A

Applications

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



Features

- Low $V_{ce(sat)}$ with Trench technology
- $V_{ce(sat)}$ with positive temperature coefficient
- High short circuit capability(10us)
- Including ultra fast & soft recovery anti-parallel FWD
- Low inductance
- Maximum junction temperature 175°C

● IGBT

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Collector-Emitter Voltage	V_{CES}	$V_{GE}=0V, I_c=1mA, T_{vj}=25^{\circ}C$	1200	V
Continuous Collector Current	I_c	$T_c=100^{\circ}C$	100	A
Repetitive Peak Collector Current	I_{CRM}	$t_p=1ms$	200	A
Gate-Emitter Voltage	V_{GES}	$T_{vj}=25^{\circ}C$	± 20	V
Total Power Dissipation	P_{tot}	$T_c=25^{\circ}C$ $T_{vjmax}=175^{\circ}C$	785	W


Characteristic values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Gate-emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}$, $I_C=4mA$, $T_{vj}=25^{\circ}C$	5.0	6.2	7.0	V
Collector-Emitter Cut-off Current	I_{CES}	$V_{CE}=1200V$, $V_{GE}=0V$, $T_{vj}=25^{\circ}C$			1.0	mA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=100A$, $V_{GE}=15V$, $T_{vj}=25^{\circ}C$		1.85		V
		$I_C=100A$, $V_{GE}=15V$, $T_{vj}=125^{\circ}C$		2.05		
Input Capacitance	C_{ies}	$V_{CE}=25V$, $V_{GE}=0V$, $f=1MHz$, $T_{vj}=25^{\circ}C$		7.43		nF
Reverse Transfer Capacitance	C_{res}			0.34		nF
Gate-Emitter leakage current	I_{GES}	$V_{CE}=0V$, $V_{GE}=20V$, $T_{vj}=25^{\circ}C$			400	nA
Turn-on Delay Time	$t_{d(on)}$	$I_C=100A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=5.6\Omega$ $T_{vj}=25^{\circ}C$		279		ns
Rise Time	t_r			61		ns
Turn-off Delay Time	$t_{d(off)}$			308		ns
Fall Time	t_f			205		ns
Energy Dissipation During Turn-on Time	E_{on}			8.32		mJ
Energy Dissipation During Turn-off Time	E_{off}			8.05		mJ
Turn-on Delay Time	$t_{d(on)}$	$I_C=100A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=5.6\Omega$ $T_{vj}=125^{\circ}C$		287		ns
Rise Time	t_r			63		ns
Turn-off Delay Time	$t_{d(off)}$			328		ns
Fall Time	t_f			360		ns
Energy Dissipation During Turn-on Time	E_{on}			11.65		mJ
Energy Dissipation During Turn-off Time	E_{off}			10.9		mJ
SC Data	I_{sc}	$T_p \leq 10\mu s$, $V_{GE}=15V$, $T_{vj}=150^{\circ}C$, $V_{cc}=600V$, $V_{CEM} \leq 1200V$		470		A



● Diode

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	$T_{vj}=25^{\circ}\text{C}$	1200	V
Continuous DC Forward Current	I_F		100	A
Repetitive Peak Forward Current	I_{FRM}	$t_p=1\text{ms}$	200	A

Characteristic values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	$I_F=100\text{A}, T_{vj}=25^{\circ}\text{C}$		1.80		V
		$I_F=100\text{A}, T_{vj}=125^{\circ}\text{C}$		1.85		
Recovered Charge	Q_{rr}	$I_F=100\text{A}$		11.4		μC
Peak Reverse Recovery Current	I_{rr}	$V_R=600\text{V}$ $-di_F/dt=1900\text{A}/\mu\text{s}$		103		A
Reverse Recovery Energy	E_{rec}	$T_{vj}=25^{\circ}\text{C}$		5.8		mJ
Recovered Charge	Q_{rr}	$I_F=100\text{A}$		22.5		μC
Peak Reverse Recovery Current	I_{rr}	$V_R=600\text{V}$ $-di_F/dt=1900\text{A}/\mu\text{s}$		140		A
Reverse Recovery Energy	E_{rec}	$T_{vj}=125^{\circ}\text{C}$		10.6		mJ



● Module Characteristics

 $T_C=25^{\circ}\text{C}$ unless otherwise specified

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Isolation voltage	V_{isol}	$t=1\text{min}, f=50\text{Hz}$	2500			V
Maximum Junction Temperature	T_{jmax}				175	$^{\circ}\text{C}$
Operating Junction Temperature	$T_{\text{vj op}}$		-40		150	$^{\circ}\text{C}$
Storage Temperature	T_{stg}		-40		125	$^{\circ}\text{C}$
Thermal Resistance Junction-to Case	$R_{\theta \text{JC}}$	per IGBT			0.19	K/W
		per Diode			0.29	
Thermal Resistance Case-to Sink	$R_{\theta \text{CS}}$	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

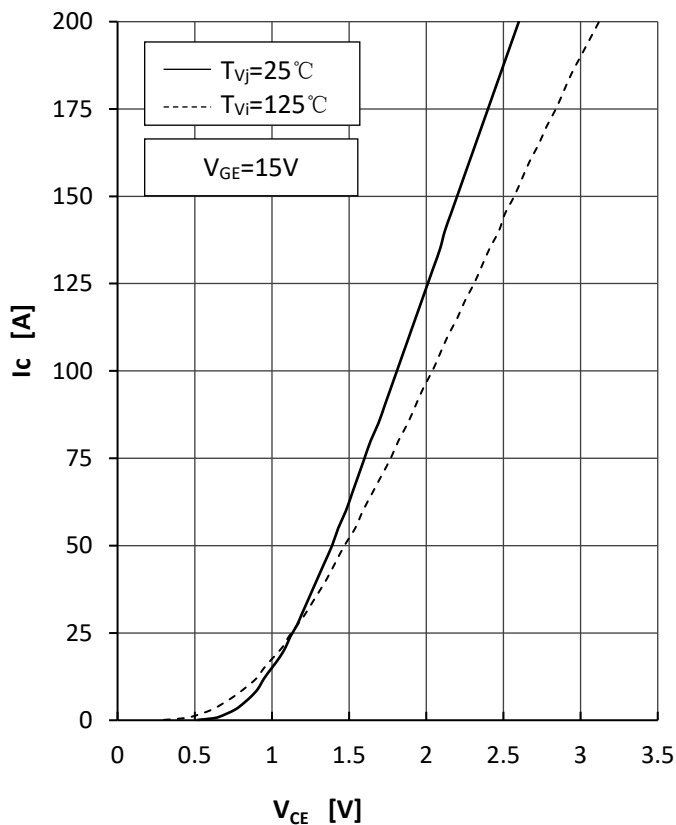


Fig1.IGBT Output Characteristics

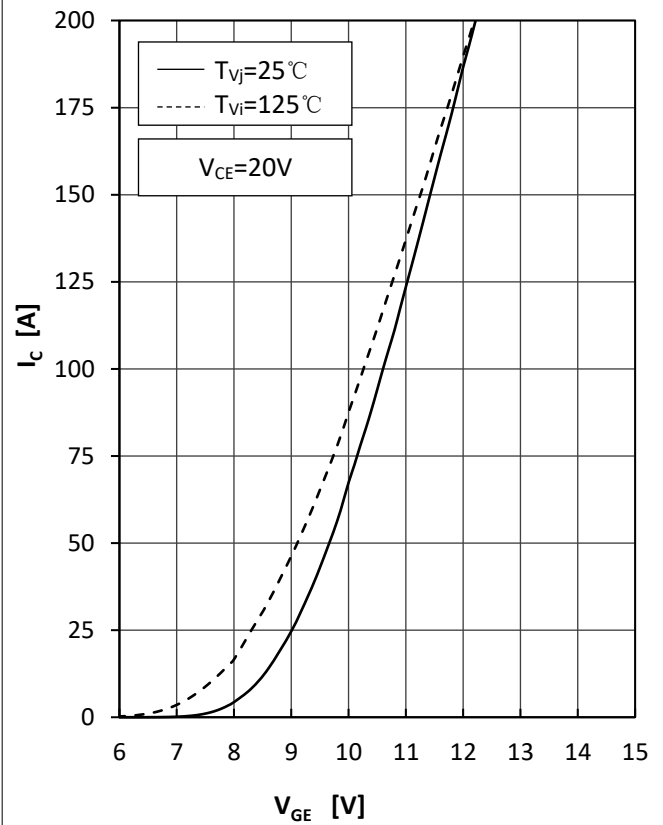


Fig2.IGBT Transfer Characteristics

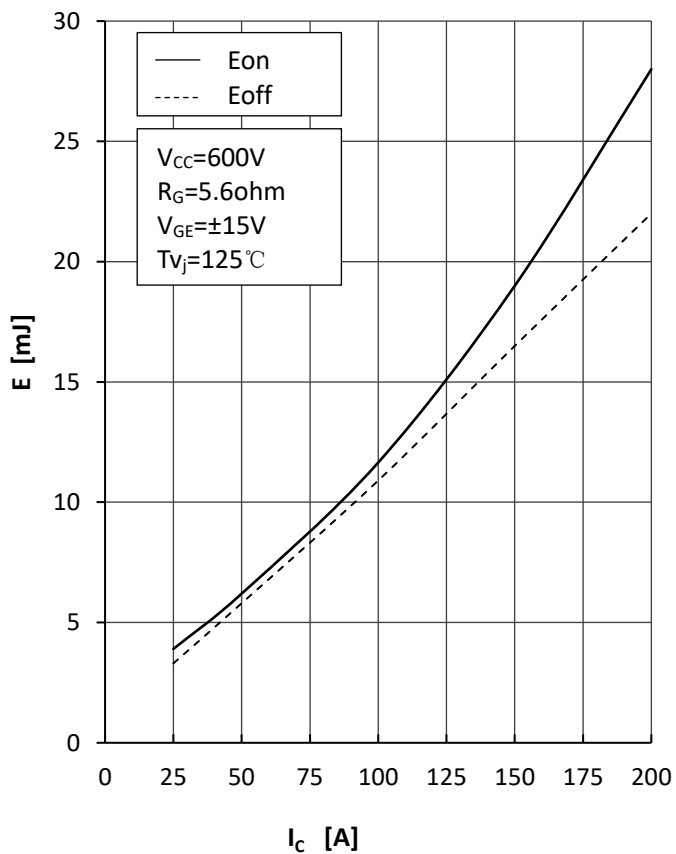


Fig3.IGBT Switching Loss vs.Ic

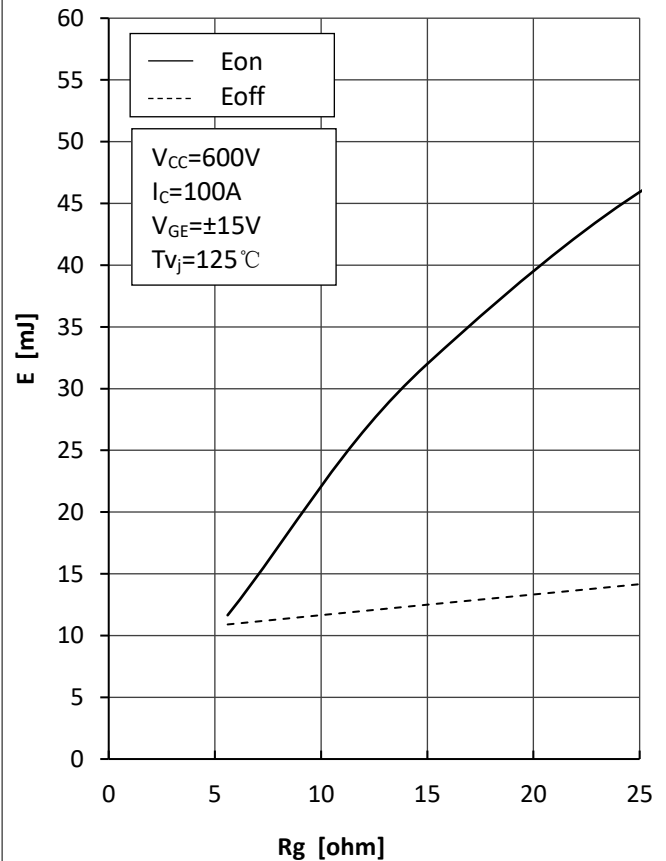
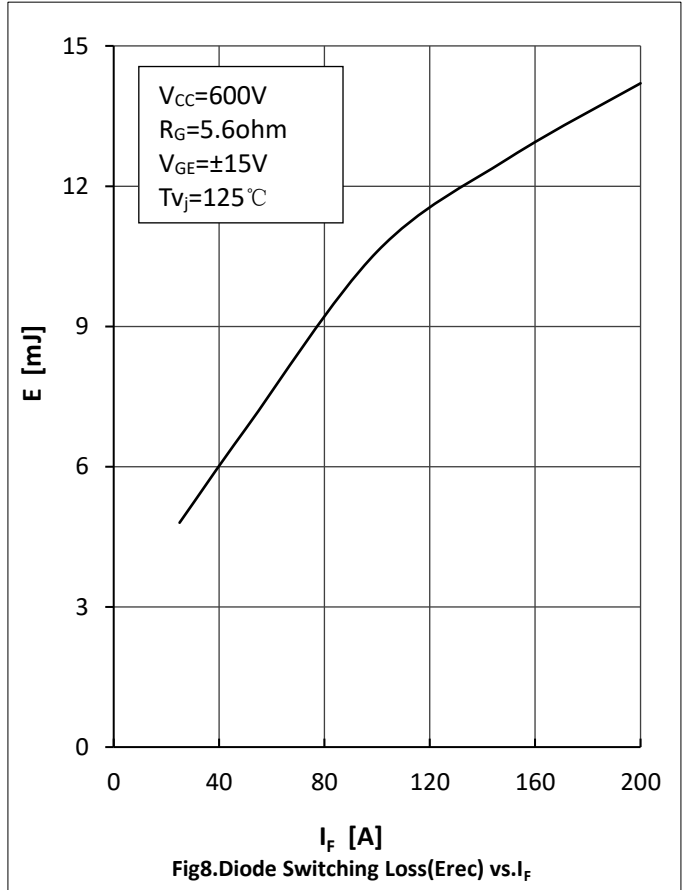
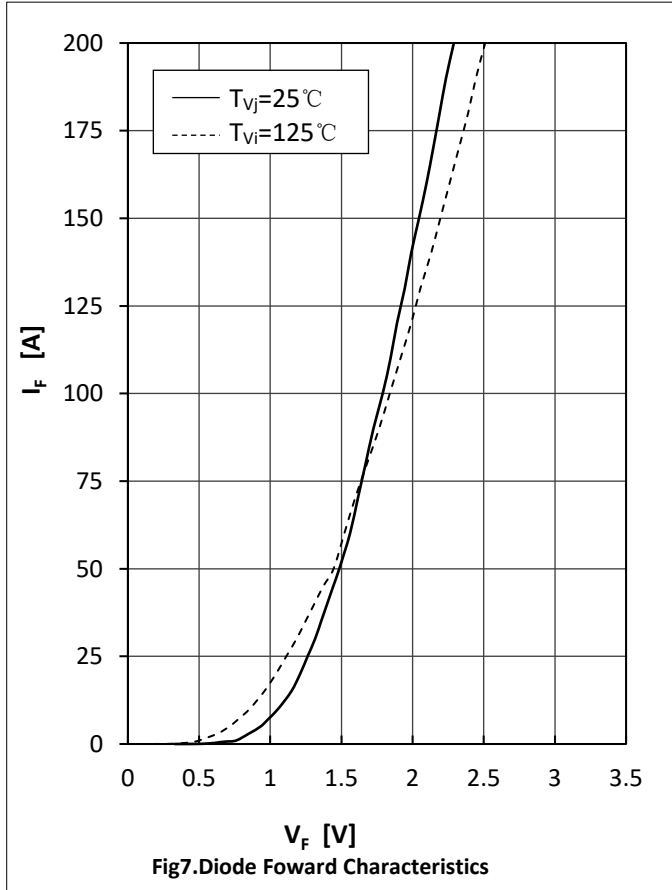
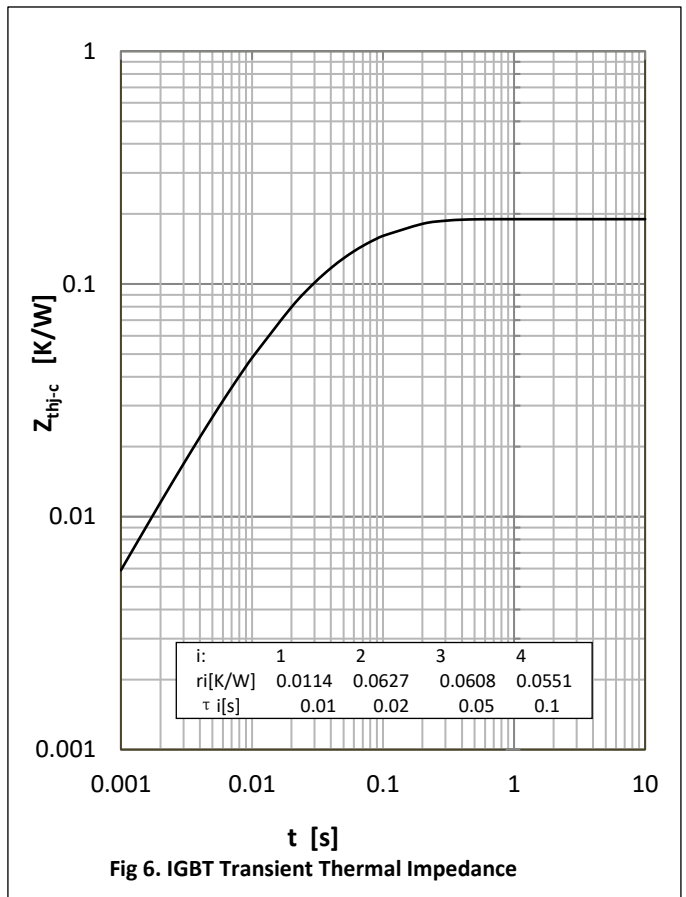
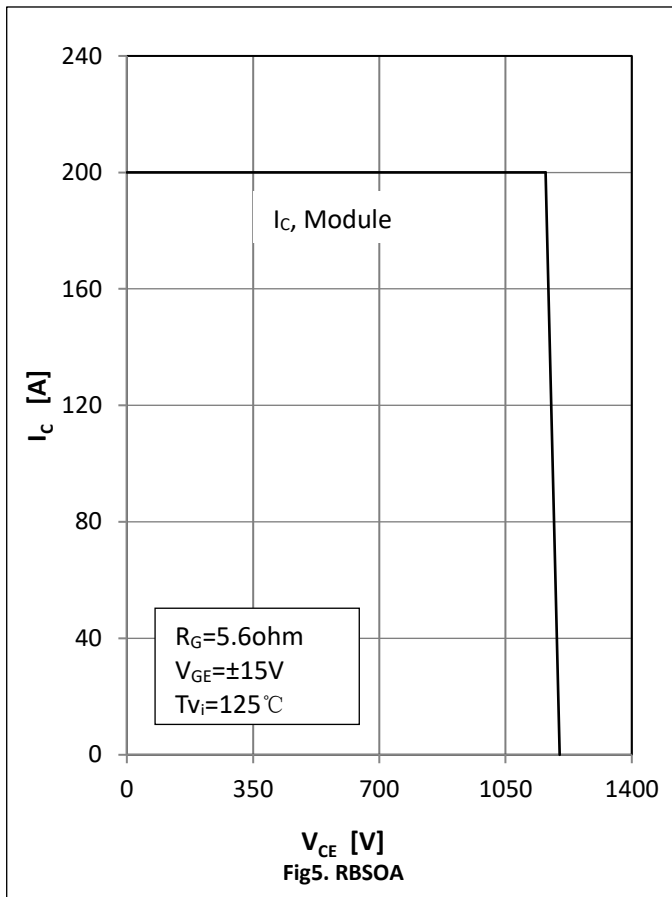
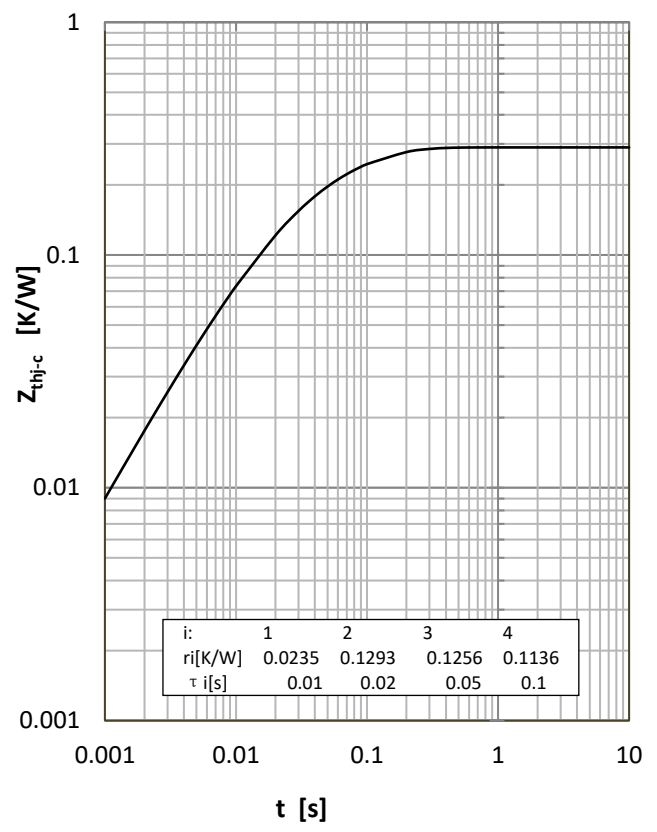
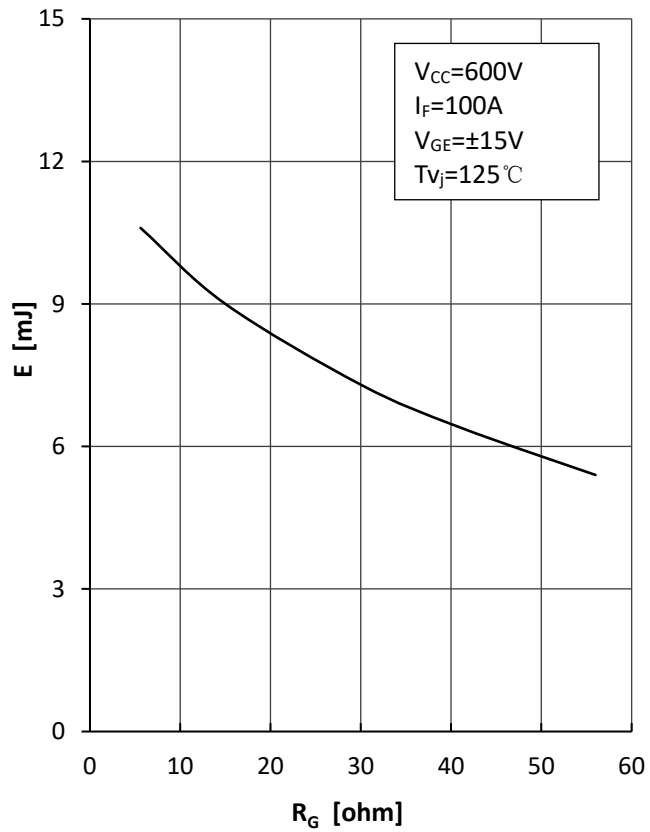


Fig4.IGBT Switching Loss vs.Rg





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