



GT150HF120T2VH

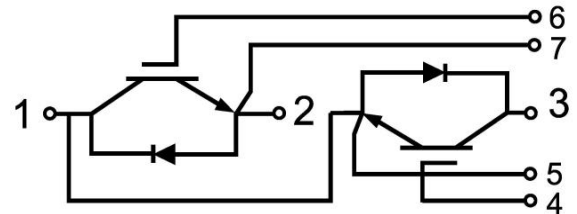
IGBT Module

Preliminary Data

Features:

- Field Stop Trench Gate IGBT
- Short Circuit Rated > 10 μ s
- Low Saturation Voltage
- Low Switching Loss
- 100% RBSOA Tested (2 $\times$ I_C)
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement

Circuit Diagram



Applications:

- Motor Drives
- Servo Drives
- UPS Systems

IGBT, Inverter

Maximum Rated Values (T_C=25°C unless otherwise specified)

V _{CES}	Collector-Emitter Blocking Voltage		1200	V
V _{GES}	Gate-Emitter Voltage		±20	V
I _C	Continuous Collector Current	T _C =100°C	150	A
		T _C =25°C	300	A
I _{CM}	Peak Collector Current Repetitive	t _p =1ms	300	A
P _D	Maximum Power Dissipation (IGBT)	T _C =25°C T _{Jmax} =175°C	1045	W



Electrical Characteristics of IGBT ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Static Characteristics

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$I_C=5.3\text{mA}$, $V_{CE}=V_{GE}$		5.0	5.8	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=150\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^{\circ}\text{C}$		1.65	2.10	V
			$T_J=125^{\circ}\text{C}$		1.90		V
			$T_J=150^{\circ}\text{C}$		1.95		V
I_{CES}	Collector-Emitter Leakage Current	$V_{GE}=0\text{V}$, $V_{CE}=V_{CES}$, $T_J=25^{\circ}\text{C}$				1	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{GE}=20\text{V}$, $V_{CE}=0\text{V}$, $T_J=25^{\circ}\text{C}$				200	nA
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{kHz}$			15.74		nF
C_{oes}	Output Capacitance				0.88		nF
C_{res}	Reverse Transfer Capacitance				0.16		nF

Switching Characteristics

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600V, I_C=150A,$ $R_{Gon}=6.8\Omega, V_{GE}=\pm 15V,$ Inductive Load	$T_J=25^{\circ}C$		449		ns
			$T_J=125^{\circ}C$		454		
			$T_J=150^{\circ}C$		537		
t_r	Rise Time		$T_J=25^{\circ}C$		130		ns
			$T_J=125^{\circ}C$		133		
			$T_J=150^{\circ}C$		141		
$t_{d(off)}$	Turn-off Delay Time	$T_J=25^{\circ}C$		409		ns	
		$T_J=125^{\circ}C$		414			
		$T_J=150^{\circ}C$		437			
t_f	Fall Time	$T_J=25^{\circ}C$		262		ns	
		$T_J=125^{\circ}C$		454			
		$T_J=150^{\circ}C$		454			
E_{on}	Turn-on Switching Loss	$V_{CC}=600V, I_C=150A,$ $R_{Gon}=6.8\Omega, V_{GE}=\pm 15V,$ $di/dt=964A/\mu s(T_J=150^{\circ}C),$ Inductive Load	$T_J=25^{\circ}C$		19.6		mJ
		$T_J=125^{\circ}C$		21.2			
		$T_J=150^{\circ}C$		21.6			



E _{off}	Turn-off Switching Loss	V _{CC} =600V, I _C =150A, R _{Goff} =6.8Ω, V _{GE} =±15V, du/dt=3545V/μs(T _J =150°C), Inductive Load	T _J =25°C		10.4		mJ
			T _J =125°C		15.4		
			T _J =150°C		16.0		
Q _g	Total Gate Charge	V _{GE} =+15V...-15V	T _J =25°C		1164		nC
R _{G(int)}	Internal Gate Resistor		T _J =25°C		3.0		Ω
I _{SC}	V _{CC} =600V, t _p =10us, V _{GE} =±15V, T _J =150°C				630		A
R _{θJC}	Thermal Resistance: Junction-to-Case (per IGBT)					0.14	°C/W

FWD, Inverter

Maximum Rated Values (T_C=25°C unless otherwise specified)

V _{RRM}	Repetitive Peak Reverse Voltage	T _J =25°C	1200	V
I _F	Diode Continuous Forward Current		150	A
I _{FM}	Peak Diode Current Repetitive	t _p =1ms	300	A

Electrical Characteristics of Diode (T_C=25°C unless otherwise specified)

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V _{FM}	Forward Voltage	I _F =150A	T _J =25℃		1.65		V
			T _J =125℃		1.80		
			T _J =150℃		1.80		
t _{rr}	Reverse Recovery Time	I _F =150A, -diF/dt=2039A/μs(T _J =150℃), V _R =600V, V _{GE} =-15V	T _J =25℃		264		ns
			T _J =125℃		430		
			T _J =150℃		466		
I _{rr}	Peak Reverse Recovery Current		T _J =25℃		97		A
			T _J =125℃		105		
			T _J =150℃		108		
Q _{rr}	Reverse Recovery Charge		T _J =25℃		13		μC
			T _J =125℃		22		
			T _J =150℃		25		



E _{rec}	Reverse Recovery Energy	I _F =150A, -diF/dt=2039A/μs(T _J =150℃), V _R =600V, V _{GE} =-15V	T _J =25℃		4.2		mJ
			T _J =125℃		7.9		
			T _J =150℃		9.1		
R _{θJC}	Thermal Resistance: Junction-to-Case (per Diode)					0.25	℃/W

Module

Symbol	Description	Conditions	Min.	Typ.	Max.	Units
V _{iso}	Isolation Voltage (All Terminals Shorted)	f=50Hz, 1minute	2500			V
T _J	Maximum Junction Temperature				175	℃
T _{JOP}	Maximum Operating Junction Temperature Range		-40		+150	℃
T _{stg}	Storage Temperature		-40		+125	℃
CTI	Comparative Tracking Index		200			
R _{θCS}	Case-to-Sink Thermally (Conductive Grease Applied)				0.03	℃/W
T	Power Terminals Screw:M6		3.0		5.0	N·m
T	Mounting Screw:M6		3.0		6.0	N·m
G	Weight			300		g

Ordering Information Table

Device code	G	T	150	HF	120	T2V	H
	①	②	③	④	⑤	⑥	⑦

- ① - IGBT Module
- ② - Trench, Low Switching Losses IGBT
- ③ - Rated Current (150=150A)
- ④ - Circuit Configuration: HF (Half Bridge)
- ⑤ - Rated Voltage (120=1200V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

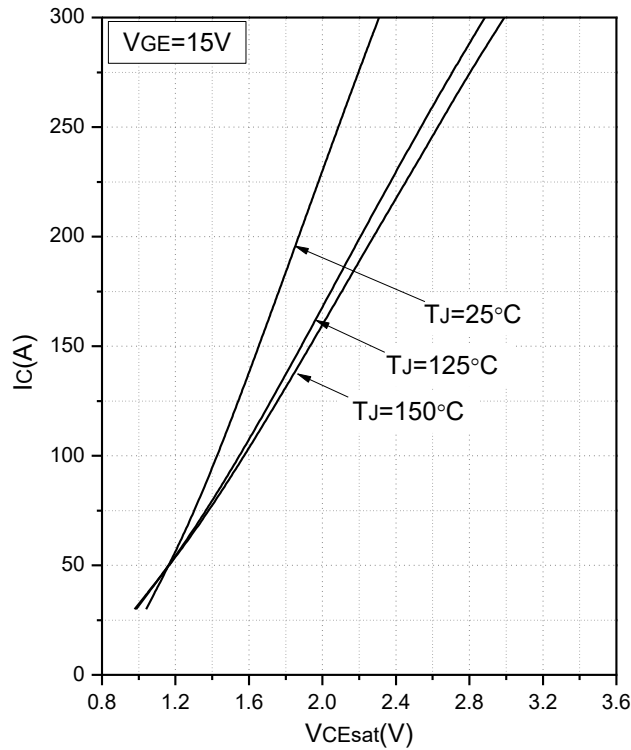


Fig.1 Typical Saturation Voltage Characteristics

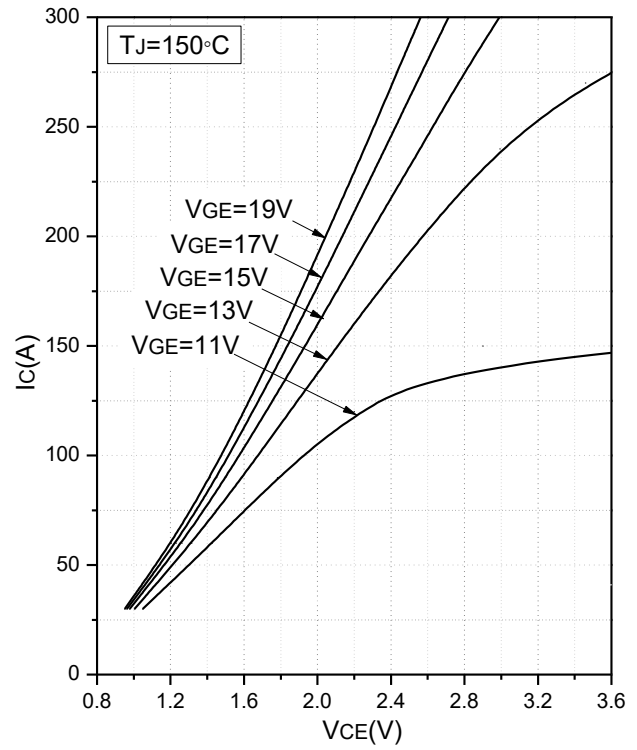


Fig.2 Typical Output Characteristics

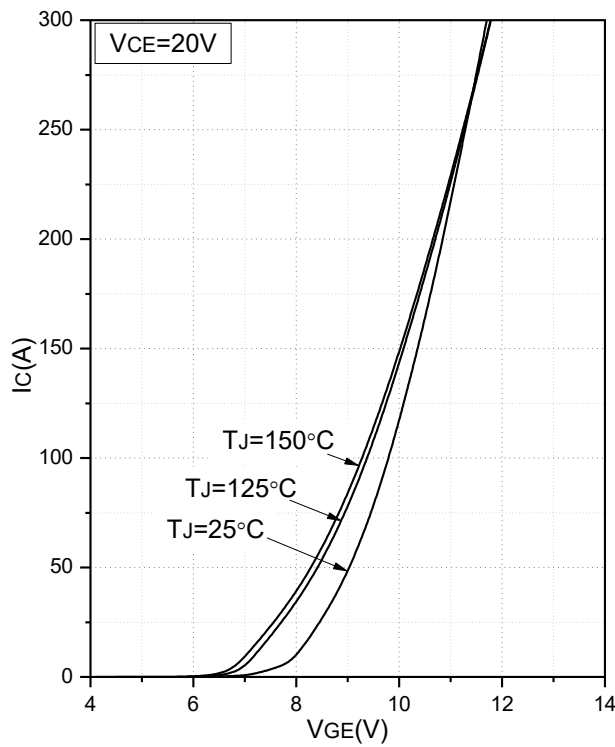


Fig.3 Transfer Characteristics

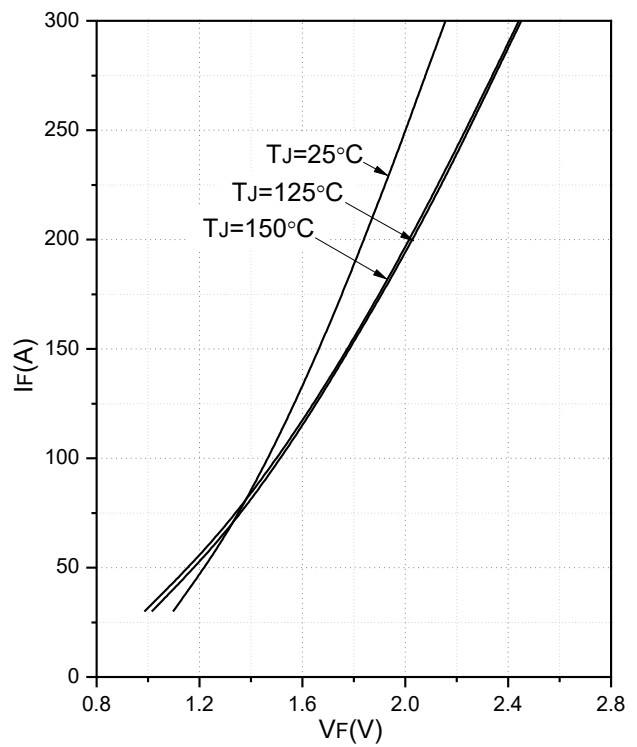


Fig.4 Forward Characteristics of FWD

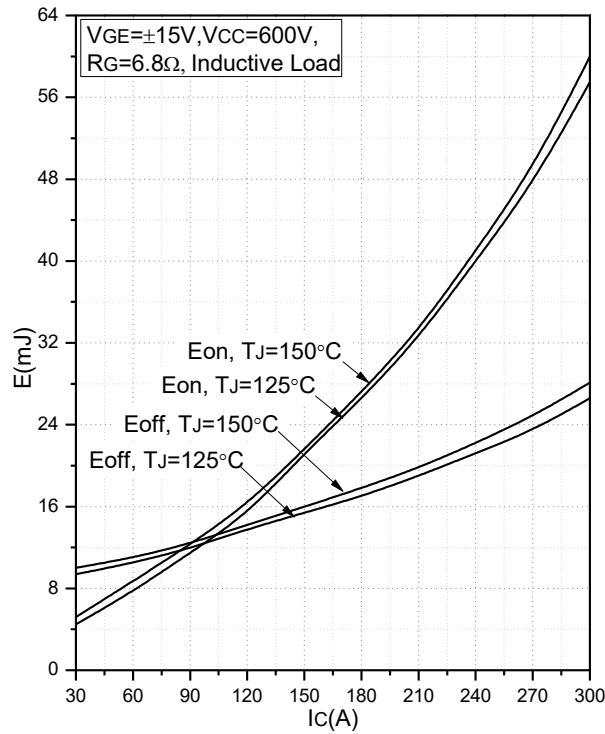


Fig.5 Typical Switching Loss vs. Collector Current

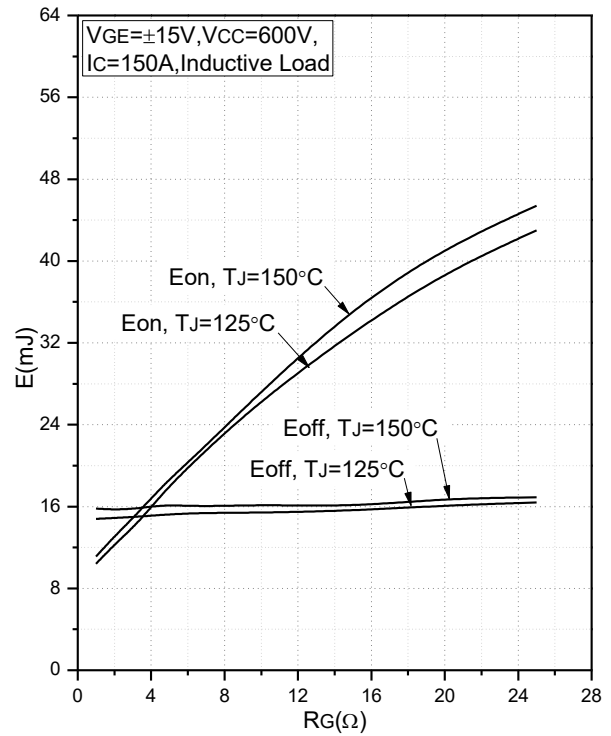


Fig.6 Typical Switching Loss vs. Gate Resistance

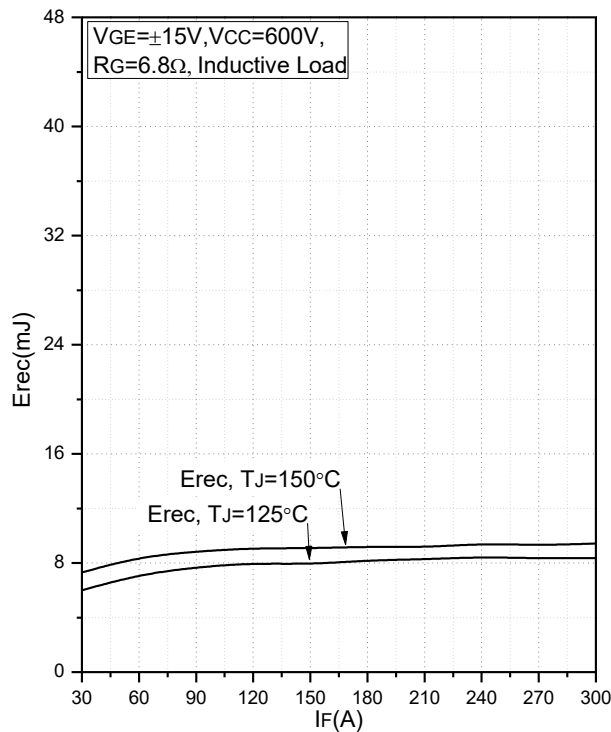


Fig.7 Typical Switching Loss vs. Forward Current

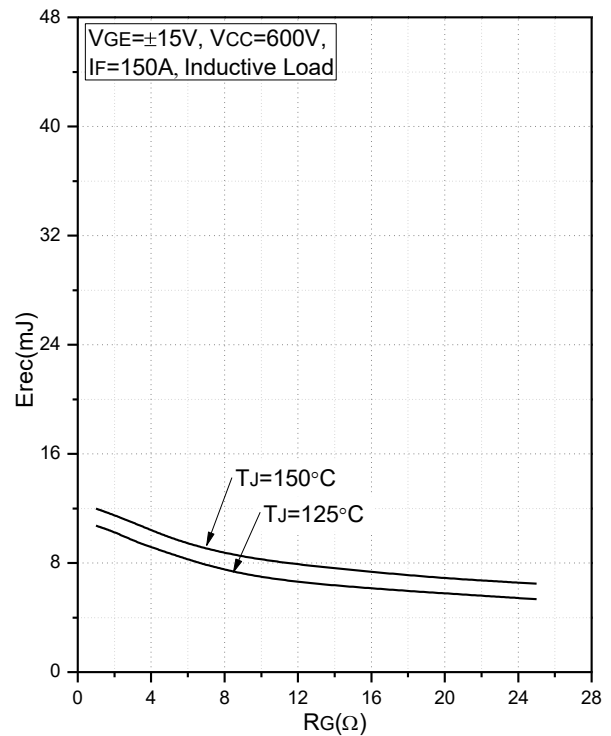
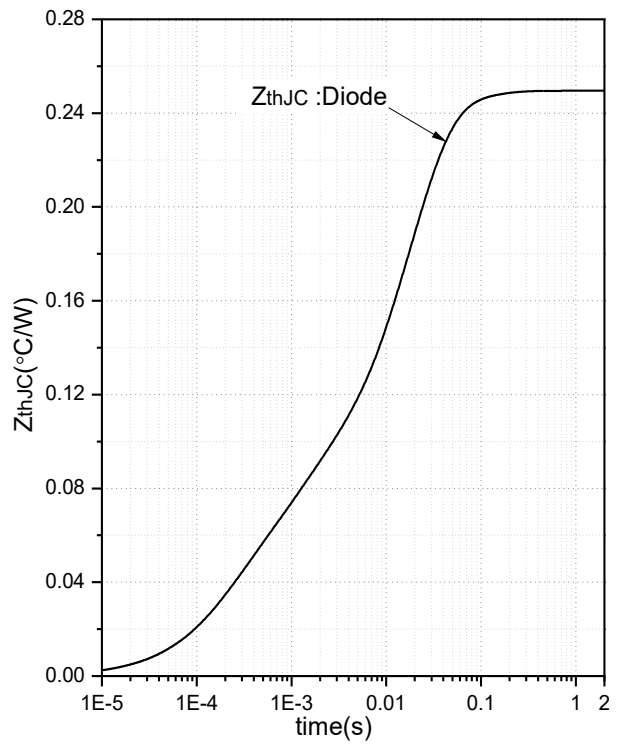
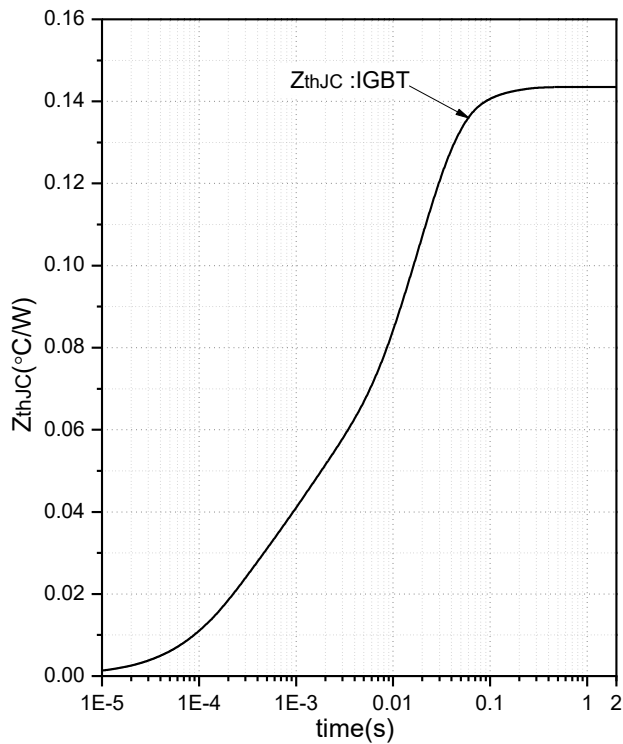
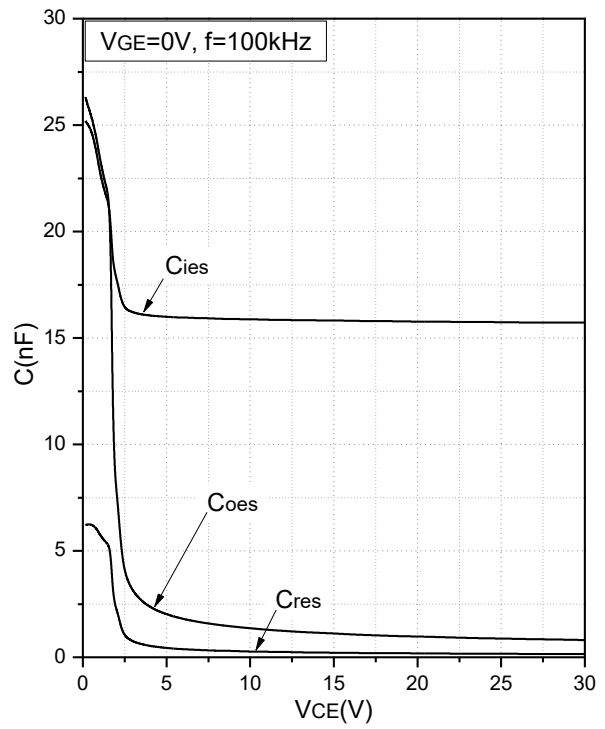
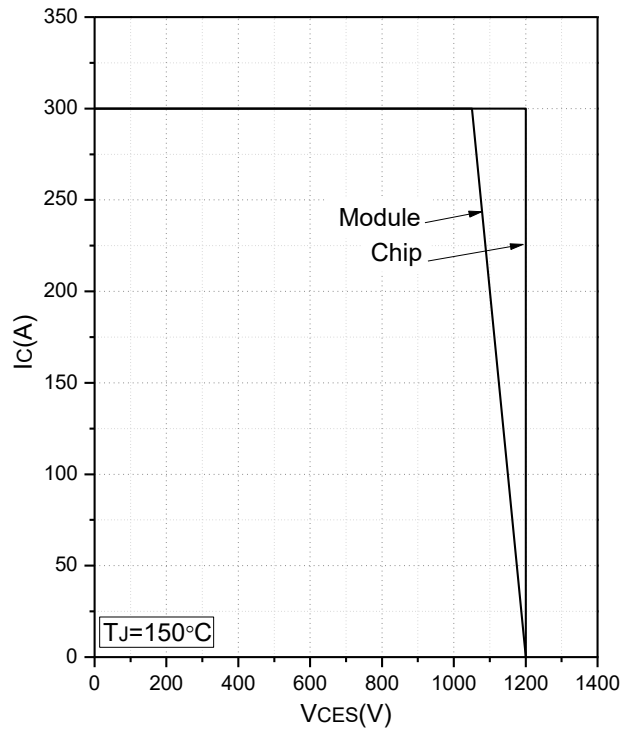


Fig.8 Typical Switching Loss vs. Gate Resistance





Revision	Notes
01	Initial Release

Announcement

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The released datasheet would be issued with “REV.” + “alphabet characters”.