

PRODUCT FEATURES

- ☐ IGBT (1200V Trench technology)
- ☐ Low switching losses
- ☐ $V_{CE(sat)}$ with positive temperature coefficient
- ☐ Fast switching and short tail current
- ☐ Free wheeling diodes with fast and soft reverse recovery



APPLICATIONS

- ☐ Industrial Motor Drives
- ☐ UPS
- ☐ HEV Inverter
- ☐ Welding

IGBT-inverter

ABSOLUTE MAXIMUM RATINGS

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

Symbol	Parameter/Test Conditions		Values	Unit
V_{CES}	Collector - Emitter Voltage	$T_J = 25^{\circ}\text{C}$	1200	V
V_{GES}	Gate - Emitter Voltage		± 20	
I_C	DC Collector Current	$T_C = 25^{\circ}\text{C}$	900	A
		$T_C = 80^{\circ}\text{C}$	600	
I_{CM}	Repetitive Peak Collector Current	$t_p = 1\text{ms}$	1200	
P_{tot}	Power Dissipation Per IGBT		2500	W

Diode-inverter

ABSOLUTE MAXIMUM RATINGS

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

Symbol	Parameter/Test Conditions		Values	Unit
V_{RRM}	Repetitive Reverse Voltage	$T_J = 25^{\circ}\text{C}$	1200	V
$I_{F(AV)}$	Average Forward Current	$T_C = 25^{\circ}\text{C}$	600	A
I_{FRM}	Repetitive Peak Forward Current	$t_p = 1\text{ms}$	900	
I^2t		$T_J = 45^{\circ}\text{C}, t = 10\text{ms}, V_R = 0\text{V}$	100	KA^2S

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IGBT-inverter
ELECTRICAL CHARACTERISTICS
 $T_C = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit	
V _{GE(th)}	Gate - Emitter Threshold Voltage	V _{CE} =V _{GE} , I _C =24mA	4.5	5.0	5.5	V	
V _{CE(sat)}	Collector - Emitter Saturation Voltage (terminal)	I _C =600A, V _{GE} =15V, T _J =25°C	1.8	2.0	2.2		
		I _C =600A, V _{GE} =15V, T _J =125°C		2.1			
I _{CES}	Collector Leakage Current	V _{CE} =1200V, V _{GE} =0V, T _J =25°C			100	μA	
		V _{CE} =1200V, V _{GE} =0V, T _J =125°C			1	mA	
I _{GES}	Gate Leakage Current	V _{CE} =0V,V _{GE} =±15V, T _J =125°C	-200		200	nA	
Q _g	Gate Charge	V _{CE} =600V, I _C =600A , V _{GE} =15V		3.5		μC	
C _{ies}	Input Capacitance	V _{CE} =25V, V _{GE} =0V, f =1MHz		65.0		nF	
C _{res}	Reverse Transfer Capacitance				1.8		nF
t _{d(on)}	Turn - on Delay Time	V _{CC} =600V,I _C =600A , R _G =30Ω, V _{GE} =±15V, Inductive Load	T _J =25°C		1100		ns
			T _J =125°C		1500		ns
t _r	Rise Time	V _{GE} =±15V, Inductive Load	T _J =25°C		170		ns
			T _J =125°C		180		ns
t _{d(off)}	Turn - off Delay Time	V _{CC} =600V,I _C =600A , R _G =30Ω, V _{GE} =±15V, Inductive Load	T _J =25°C		4470		ns
			T _J =125°C		4610		ns
t _f	Fall Time	V _{GE} =±15V, Inductive Load	T _J =25°C		260		ns
			T _J =125°C		280	200	ns
E _{on}	Turn - on Energy	V _{CC} =600V,I _C =600A , R _G =30Ω, V _{GE} =±15V, Inductive Load	T _J =25°C		41.53		mJ
			T _J =125°C		56.81		mJ
E _{off}	Turn - off Energy	V _{GE} =±15V, Inductive Load	T _J =25°C		125		mJ
			T _J =125°C		135		mJ
t _{pSC}	IGBT Short Circuit	V _{GE} ≤15V,V _{CC} =800V,I _{SC} =2400A T _J ≤125°C,V _{CEM} ≤1200V			10	μs	
R _{thJC}	Junction-to-Case Thermal Resistance （Per IGBT）				0.05	K /W	

Diode-inverter
ELECTRICAL CHARACTERISTICS
 $T_C = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
V _F	Forward Voltage	I _F =600A , V _{GE} =0V, T _J =25°C		2.5	2.7	V
		I _F =600A , V _{GE} =0V, T _J =125°C		2.8		
I _{RRM}	Max. Reverse Recovery Current	I _F =600A , V _R =600V dI _F /dt=-500A/μs T _J =125°C		120		A
Q _{RR}	Reverse Recovery Charge			150		μC
E _{rec}	Reverse Recovery Energy			86		mJ
R _{thJC}	Junction-to-Case Thermal Resistance （Per Diode）				0.09	K /W

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

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
$T_{j\max}$	Max. Junction Temperature				175	$^\circ\text{C}$
$T_{j\text{op}}$	Operating Temperature		-40		150	
T_{stg}	Storage Temperature		-40		150	
V_{isol}	Isolation Breakdown Voltage	AC, 50Hz(R.M.S), t=1minute			3000	V
Torque	to terminal	Recommended (M6)	3		5	Nm
	to heatsink	Recommended (M5)	2.5		5	Nm
Weight				350		g

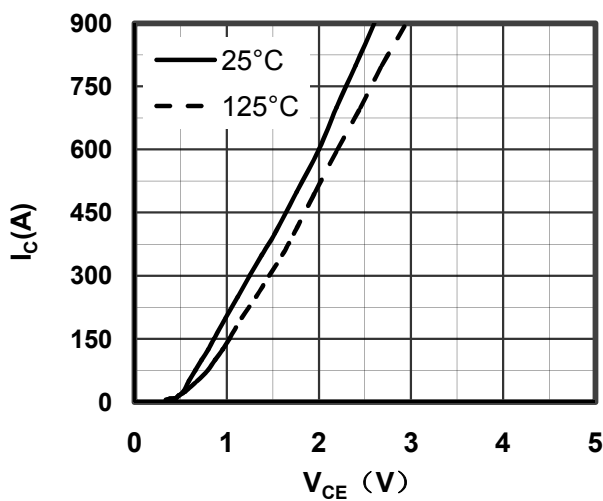


Figure 1. Typical Output Characteristics IGBT-inverter

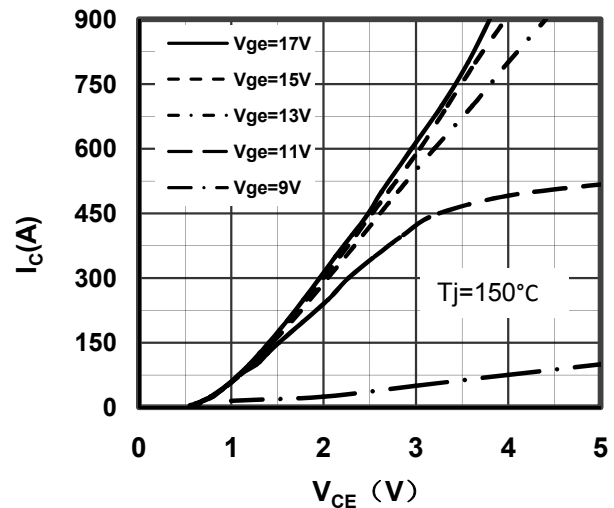


Figure 2. Typical Output Characteristics IGBT-inverter

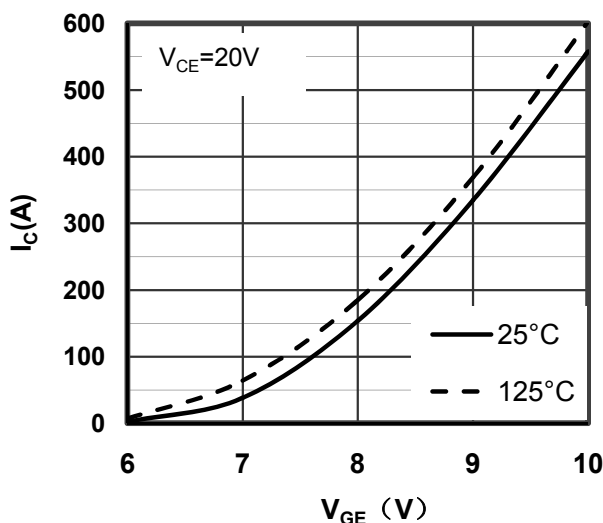


Figure 3. Typical Transfer characteristics IGBT-inverter

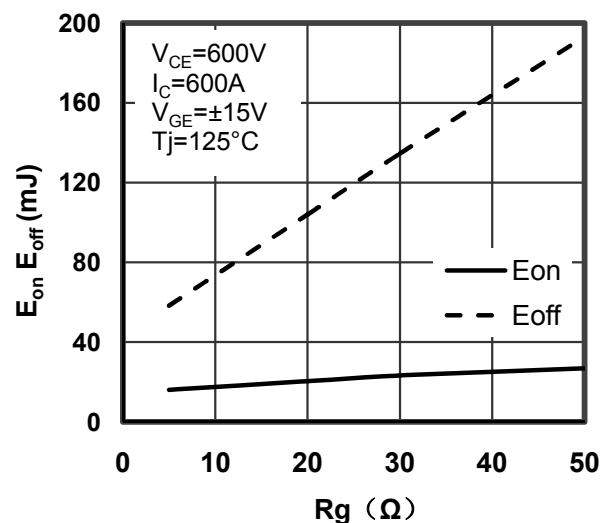


Figure 4. Switching Energy vs. Gate Resistor IGBT-inverter

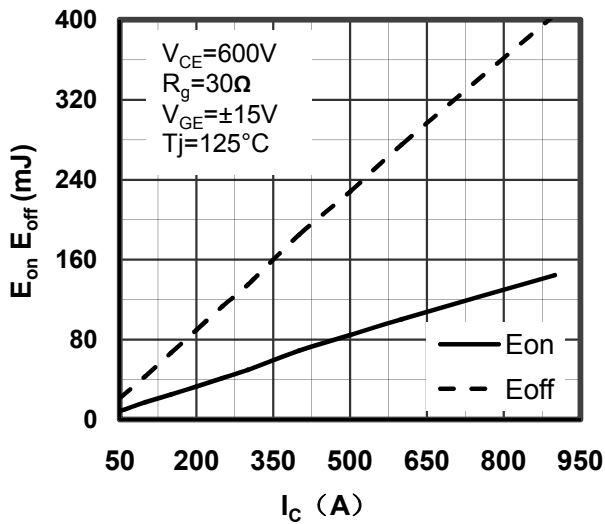


Figure 5. Switching Energy vs. Collector Current IGBT-inverter

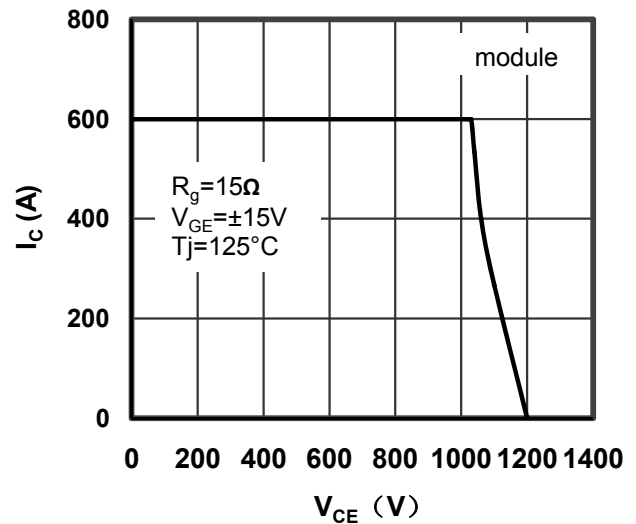


Figure 6. Reverse Biased Safe Operating Area IGBT-inverter

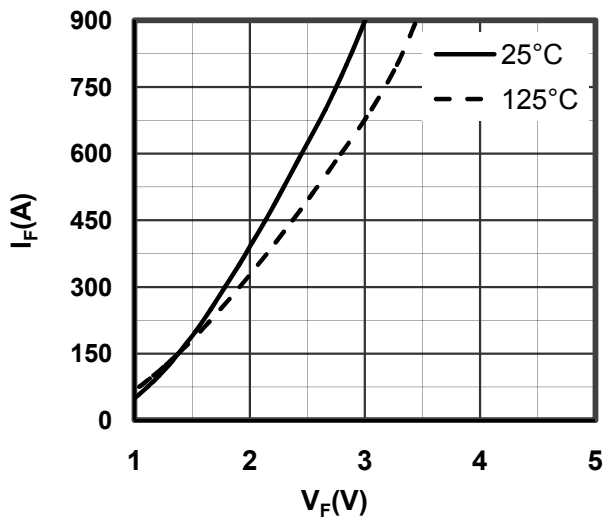


Figure 7. Diode Forward Characteristics Diode -inverter

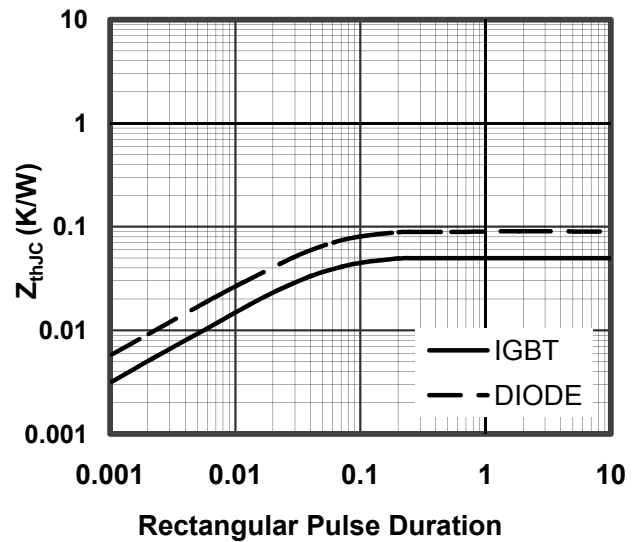


Figure 8. Transient Thermal Impedance of Diode and IGBT-inverter

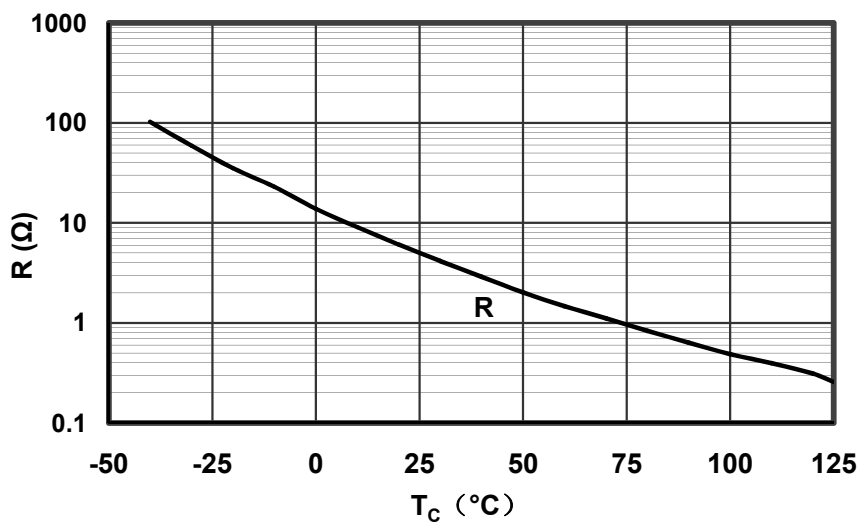


Figure 9. NTC Characteristics

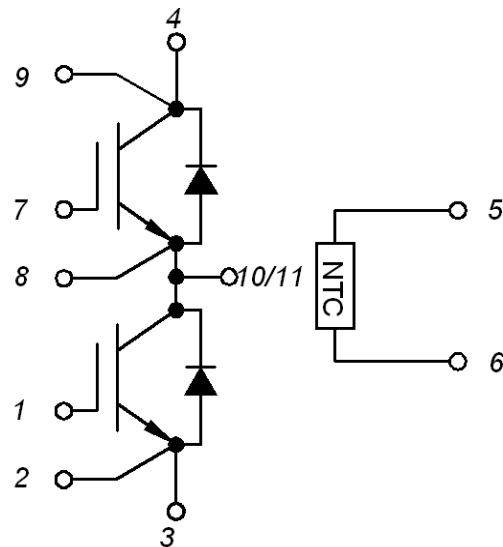


Figure 10. Circuit Diagram

