

## PRODUCT FEATURES

- IGBT3 CHIP(1700V Trench+Field Stop technology)
- Low turn-off losses, short tail current
- $V_{CE(sat)}$  with positive temperature coefficient
- DIODE CHIP(1700V EMCON 3 technology)
- Free wheeling diodes with fast and soft reverse recovery



## APPLICATIONS

- High frequency switching application
- Medical applications
- Motion/servo control
- UPS systems

## 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	$T_J=25^\circ\text{C}$	1700	V
$V_{GES}$	Gate Emitter Voltage		$\pm 20$	
$I_C$	DC Collector Current	$T_C=25^\circ\text{C}$	105	A
		$T_C=95^\circ\text{C}$	75	
$I_{CM}$	Repetitive Peak Collector Current	$t_p=1\text{ms}$	150	
$P_{tot}$	Power Dissipation Per IGBT		550	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	$T_J=25^\circ\text{C}$	1700	V
$I_{F(AV)}$	Average Forward Current	$T_C=25^\circ\text{C}$	75	A
$I_{FRM}$	Repetitive Peak Forward Current	$t_p=1\text{ms}$	150	
$i^2t$		$T_J=125^\circ\text{C}, t=10\text{ms}, V_R=0\text{V}$	1050	$\text{A}^2\text{S}$

## 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	$V_{CE}=V_{GE}, I_C=3\text{mA}$	5.2	5.8	6.4	V	
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	$I_C=75\text{A}, V_{GE}=15\text{V}, T_J=25^\circ\text{C}$		2	2.45		
		$I_C=75\text{A}, V_{GE}=15\text{V}, T_J=125^\circ\text{C}$		2.4			
$I_{CES}$	Collector Leakage Current	$V_{CE}=1700\text{V}, V_{GE}=0\text{V}, T_J=25^\circ\text{C}$			3	mA	
		$V_{CE}=1700\text{V}, V_{GE}=0\text{V}, T_J=125^\circ\text{C}$			20	mA	
$I_{GES}$	Gate Leakage Current	$V_{CE}=0\text{V}, V_{GE}=\pm 15\text{V}, T_J=25^\circ\text{C}$	-400		400	nA	
$R_{gint}$	Integrated Gate Resistor			8.5		$\Omega$	
$Q_g$	Gate Charge	$V_{CE}=900\text{V}, I_C=75\text{A}, V_{GE}=\pm 15\text{V}$		0.9		$\mu\text{C}$	
$C_{ies}$	Input Capacitance	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=1\text{MHz}$		6.8		nF	
$C_{res}$	Reverse Transfer Capacitance				220		pF
$t_{d(on)}$	Turn on Delay Time	$V_{CC}=900\text{V}, I_C=75\text{A}$ $R_G=6.8\Omega,$ $V_{GE}=\pm 15\text{V},$ Inductive Load	$T_J=25^\circ\text{C}$		370		ns
			$T_J=125^\circ\text{C}$		400		ns
$t_r$	Rise Time	Inductive Load	$T_J=25^\circ\text{C}$		40		ns
			$T_J=125^\circ\text{C}$		50		ns
$t_{d(off)}$	Turn off Delay Time	$V_{CC}=900\text{V}, I_C=75\text{A}$ $R_G=6.8\Omega,$ $V_{GE}=\pm 15\text{V},$ Inductive Load	$T_J=25^\circ\text{C}$		650		ns
			$T_J=125^\circ\text{C}$		800		ns
$t_f$	Fall Time	Inductive Load	$T_J=25^\circ\text{C}$		180		ns
			$T_J=125^\circ\text{C}$		300		ns
$E_{on}$	Turn on Energy	$V_{CC}=900\text{V}, I_C=75\text{A}$ $R_G=6.8\Omega,$ $V_{GE}=\pm 15\text{V},$ Inductive Load	$T_J=25^\circ\text{C}$		16.5		mJ
			$T_J=125^\circ\text{C}$		24		mJ
$E_{off}$	Turn off Energy	Inductive Load	$T_J=25^\circ\text{C}$		16		mJ
			$T_J=125^\circ\text{C}$		23.5		mJ
$I_{sc}$	Short Circuit Current	$tp_{sc}\leq 10\mu\text{s}, V_{GE}=15\text{V}$ $T_J=125^\circ\text{C}, V_{CC}=1000\text{V}$		300		A	
$R_{thJC}$	Junction to Case Thermal Resistance ( Per IGBT)				0.27	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	$I_F=75\text{A}, V_{GE}=0\text{V}, T_J=25^\circ\text{C}$		1.8	2.2	V
		$I_F=75\text{A}, V_{GE}=0\text{V}, T_J=125^\circ\text{C}$		1.9		
$t_{rr}$	Reverse Recovery Time	$I_F=75\text{A}, V_R=900\text{V}$		320		ns
$I_{RRM}$	Max. Reverse Recovery Current	$di_F/dt=-1800\text{A}/\mu\text{s}$		125		A
$Q_{RR}$	Reverse Recovery Charge	$T_J=125^\circ\text{C}$		36.5		$\mu\text{C}$
$E_{rec}$	Reverse Recovery Energy				20.5	
$R_{thJCD}$	Junction to Case Thermal Resistance ( Per Diode)				0.48	K/W

**MODULE CHARACTERISTICS**

*T<sub>C</sub>=25°C unless otherwise specified*

Symbol	Parameter/Test Conditions		Values	Unit
T <sub>Jmax</sub>	Max. Junction Temperature		175	°C
T <sub>Jop</sub>	Operating Temperature		-40~150	
T <sub>stg</sub>	Storage Temperature		-40~125	
V <sub>isol</sub>	Isolation Breakdown Voltage	AC, 50Hz(R.M.S), t=1minute	4000	V
CTI	Comparative Tracking Index		> 200	
Torque	to heatsink	Recommended (M6)	3~5	Nm
	to terminal	Recommended (M5)	2.5~5	Nm
Weight			160	g

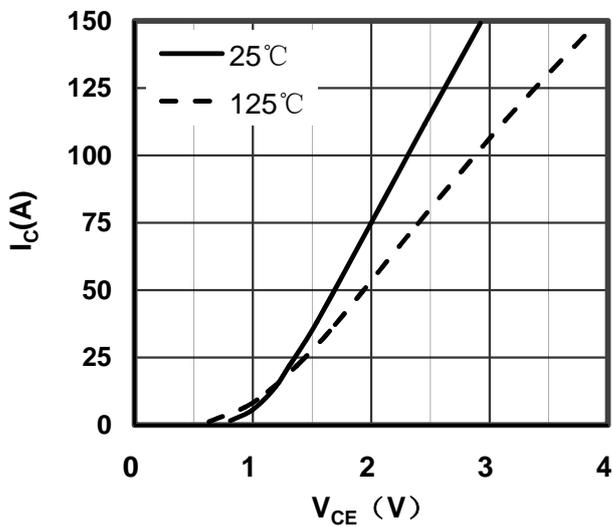


Figure 1. Typical Output Characteristics IGBT-inverter

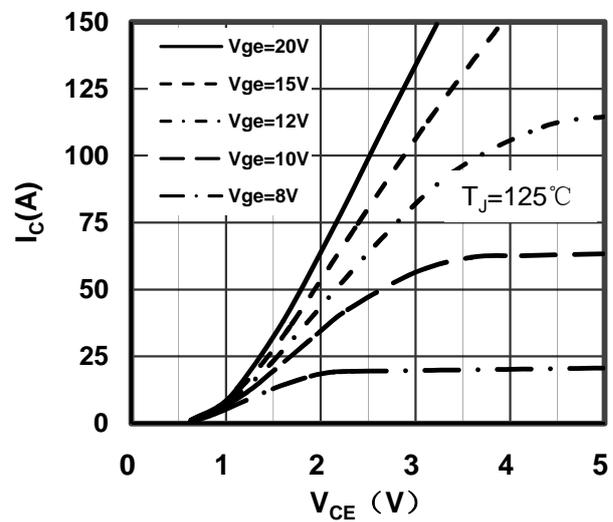


Figure 2. Typical Output Characteristics IGBT-inverter

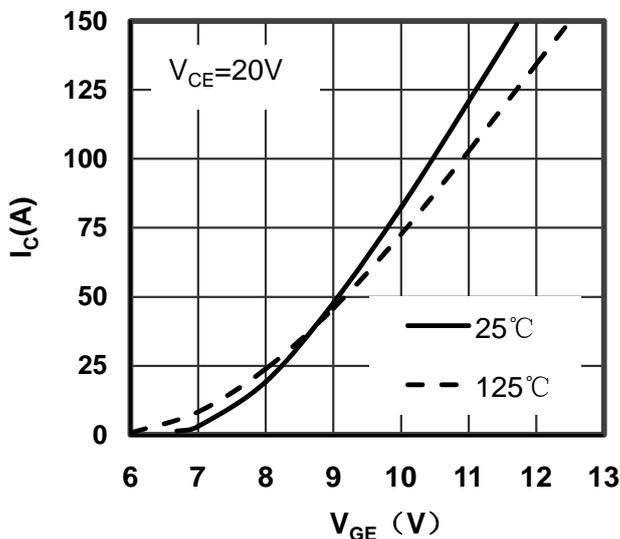


Figure 3. Typical Transfer Characteristics IGBT-inverter

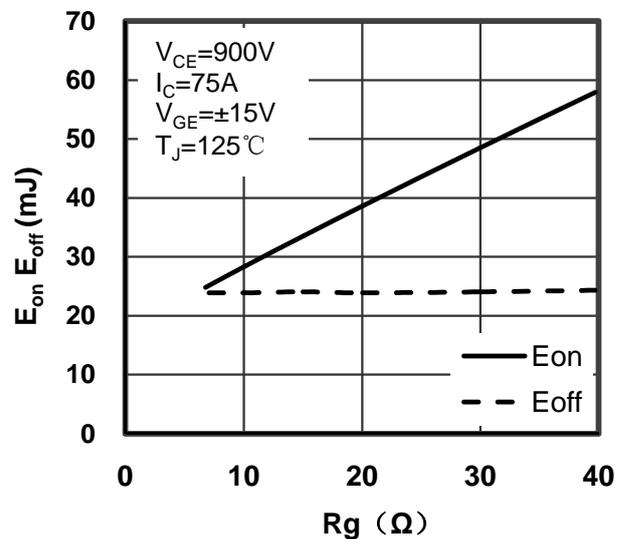


Figure 4. Switching Energy vs Gate Resistor IGBT-inverter

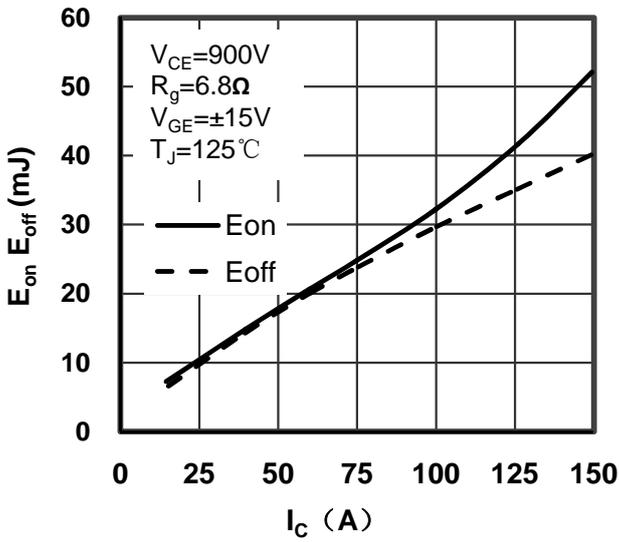


Figure 5. Switching Energy vs Collector Current IGBT-inverter

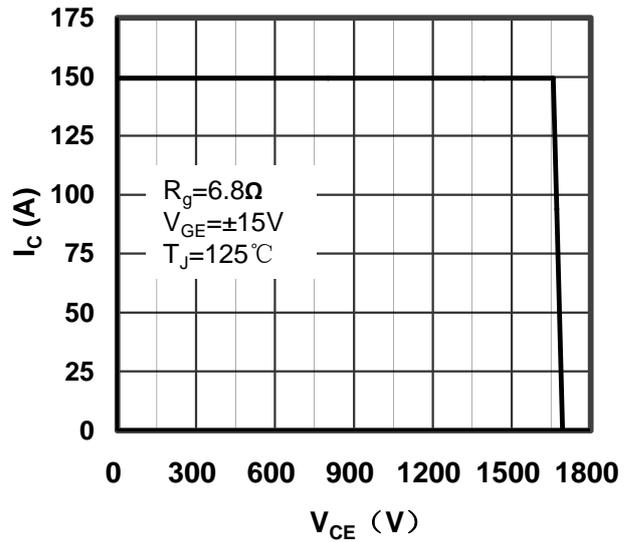


Figure 6. Reverse Biased Safe Operating Area IGBT-inverter

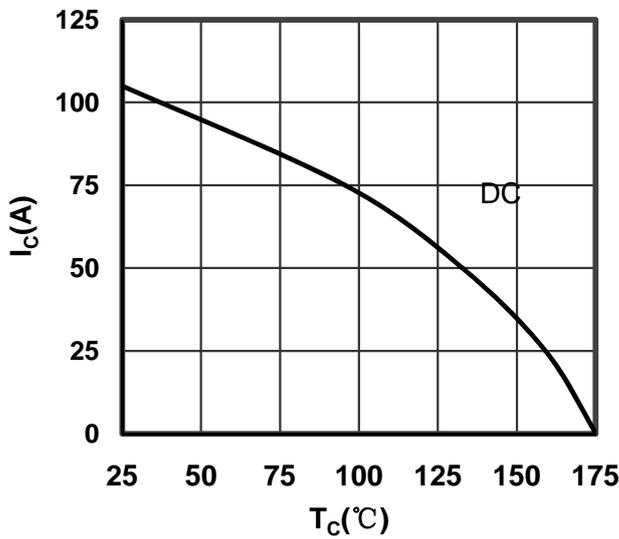


Figure 7. Collector Current vs Case temperature IGBT -inverter

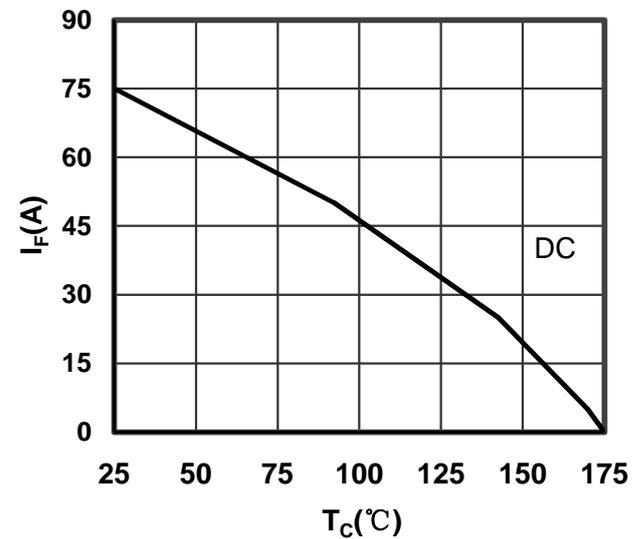


Figure 8. Forward current vs Case temperature Diode -inverter

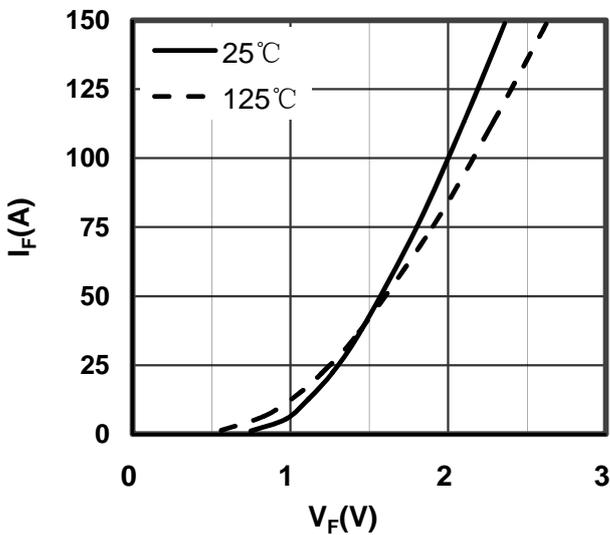


Figure 9. Diode Forward Characteristics Diode -inverter

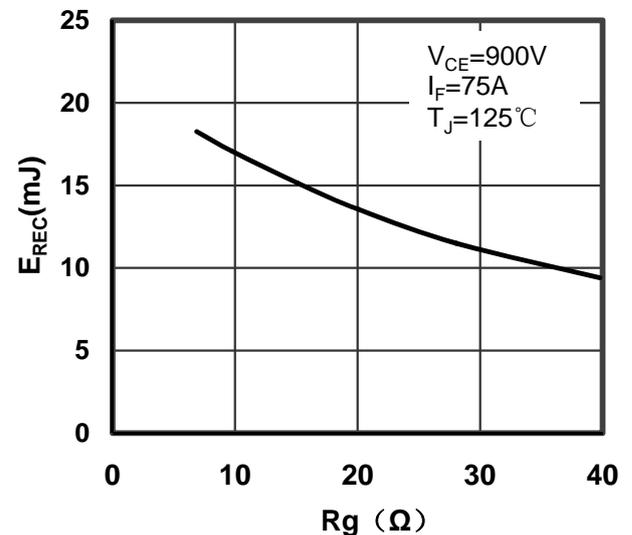


Figure 10. Switching Energy vs Gate Resistor Diode -inverter

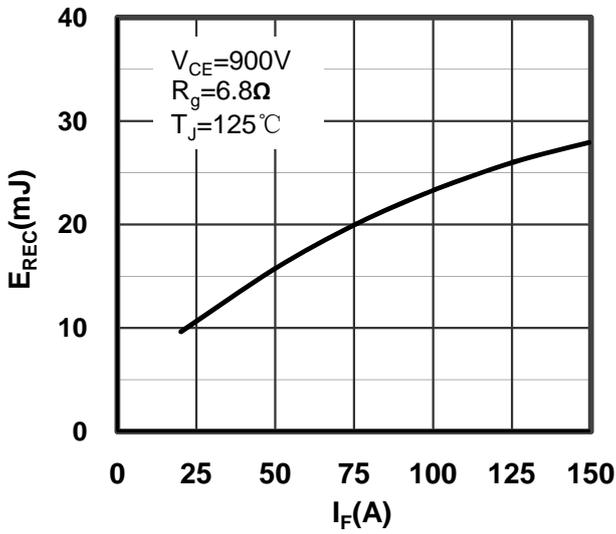


Figure 11. Switching Energy vs Forward Current Diode-inverter

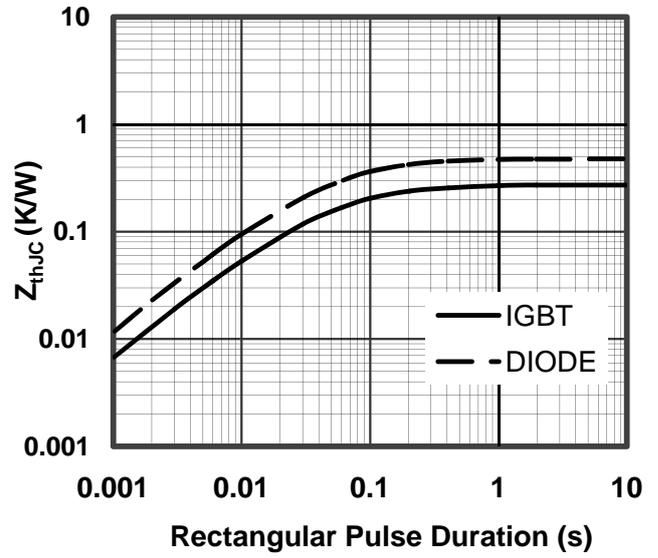


Figure 12. Transient Thermal Impedance of Diode and IGBT-inverter

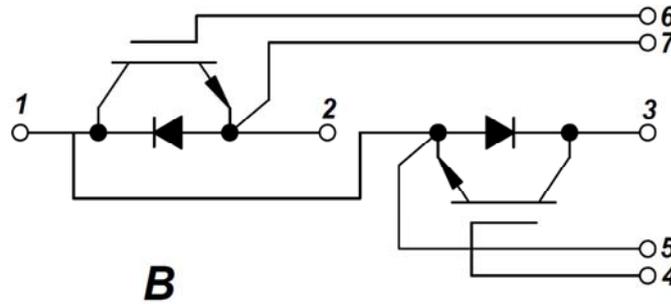
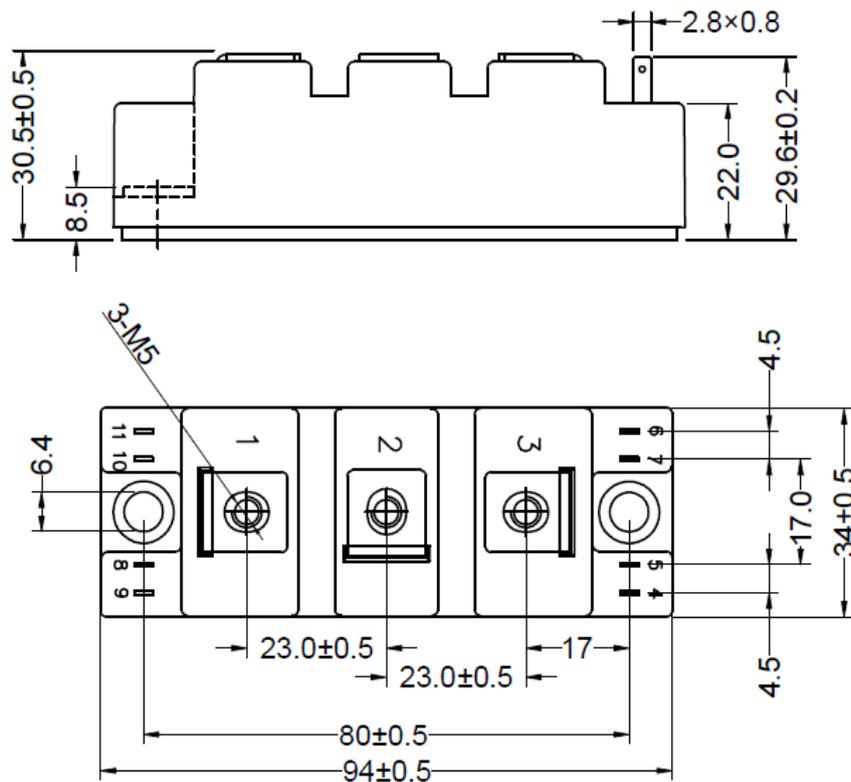


Figure 13. Circuit Diagram



Dimensions in (mm)  
Figure 14. Package Outline