

## 62mm module with fast Trench/Fieldstop IGBT and Fast Recovery Diode

### Features

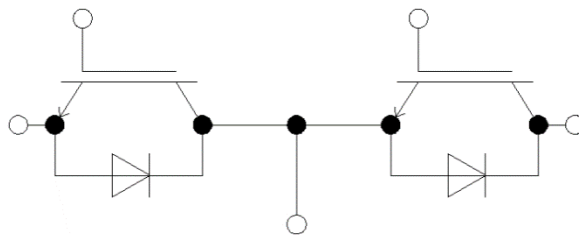
- Low Switching Losses
- Low  $V_{CEsat}$
- Low  $V_{CE(sat)}$  with Positive Temperature Coefficient

### Applications

- The inverter
- Motor control and drives
- UPS Systems



### Equivalent Circuit Schematic



### IGBT - Inverter

#### Maximum Rated Values

Symbol	Description	Conditions	Values	Unit
$V_{CES}$	Collector-Emitter Voltage	$T_{vj}=25^{\circ}C$	1200	V
$V_{GES}$	Gate-Emitter Peak Voltage	$T_{vj}=25^{\circ}C$	$\pm 20$	V
$I_C$	Continuous DC Collector Current	$T_C=100^{\circ}C$	450	A
$I_{CRM}$	Repetitive Peak Collector Current	$t_p=1ms$	900	A
$P_{tot}$	Total Power Dissipation	$T_C=25^{\circ}C, T_{vj\ max}=175^{\circ}C$	2830	W

**Characteristic Values**

Symbol	Description	Conditions	Values			Unit
			Min.	Typ.	Max.	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$V_{GE}=15V, I_C=450A, T_{vj}=25^{\circ}C$	---	1.72	--	V
		$V_{GE}=15V, I_C=450A, T_{vj}=125^{\circ}C$	---	2.06	--	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE}=V_{CE}, I_C=17mA$	5.2	5.8	6.8	V
$I_{CES}$	Collector-Emitter Cut-Off Current	$V_{CE}=1200V, V_{GE}=0V$	---	---	1	mA
$I_{GES}$	Gate-Emitter Leakage Current	$V_{GE}=20V, V_{CE}=0V$	---	---	150	nA
$R_{Gint}$	Internal gate resistor	$T_{vj}=25^{\circ}C$	---	1.8	---	$\Omega$
$C_{ies}$	Input Capacitance	$V_{CE}=25V, V_{GE}=0V, f=1MHz$	---	34.8	---	nF
$C_{res}$	Reverse Transfer Capacitance		---	1.4	---	nF
$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600V$ $V_{GE}=\pm 15V$ $I_C=450A$ $R_G=1.0\Omega$ Inductive Load $T_{vj}=25^{\circ}C$	---	214.5	---	ns
$t_r$	Turn-on Rise Time		---	98	---	ns
$t_{d(off)}$	Turn-off Delay Time		---	717	---	ns
$t_f$	Turn-off Fall Time		---	101	---	ns
$E_{on}$	Turn-on Switching Loss		---	39	---	mJ
$E_{off}$	Turn-off Switching Loss		---	50.7	---	mJ
$I_{SC}$	Short Circuit Data	$V_{GE}\leq 15V, V_{CC}=800V$ $t_p\leq 10\mu s, T_{vj}=25^{\circ}C$	---	1840	---	A
$R_{thJC}$	Thermal Resistance, Junction to Case	Per IGBT	---	0.053	---	K/W
$T_{VJOP}$	Virtual Junction Temperature	Under Switching	-40	---	150	$^{\circ}C$

**Diode - Inverter  
Maximum Rated Values**

Symbol	Description	Conditions	Values	Unit
$V_{RRM}$	Repetitive Peak Reverse Voltage	$T_{vj}=25^{\circ}C$	1200	V
$I_F$	Continuous DC Forward Current		450	A
$I_{FRM}$	Repetitive Peak Collector Current	$t_p=1ms$	900	A

## Characteristic Values

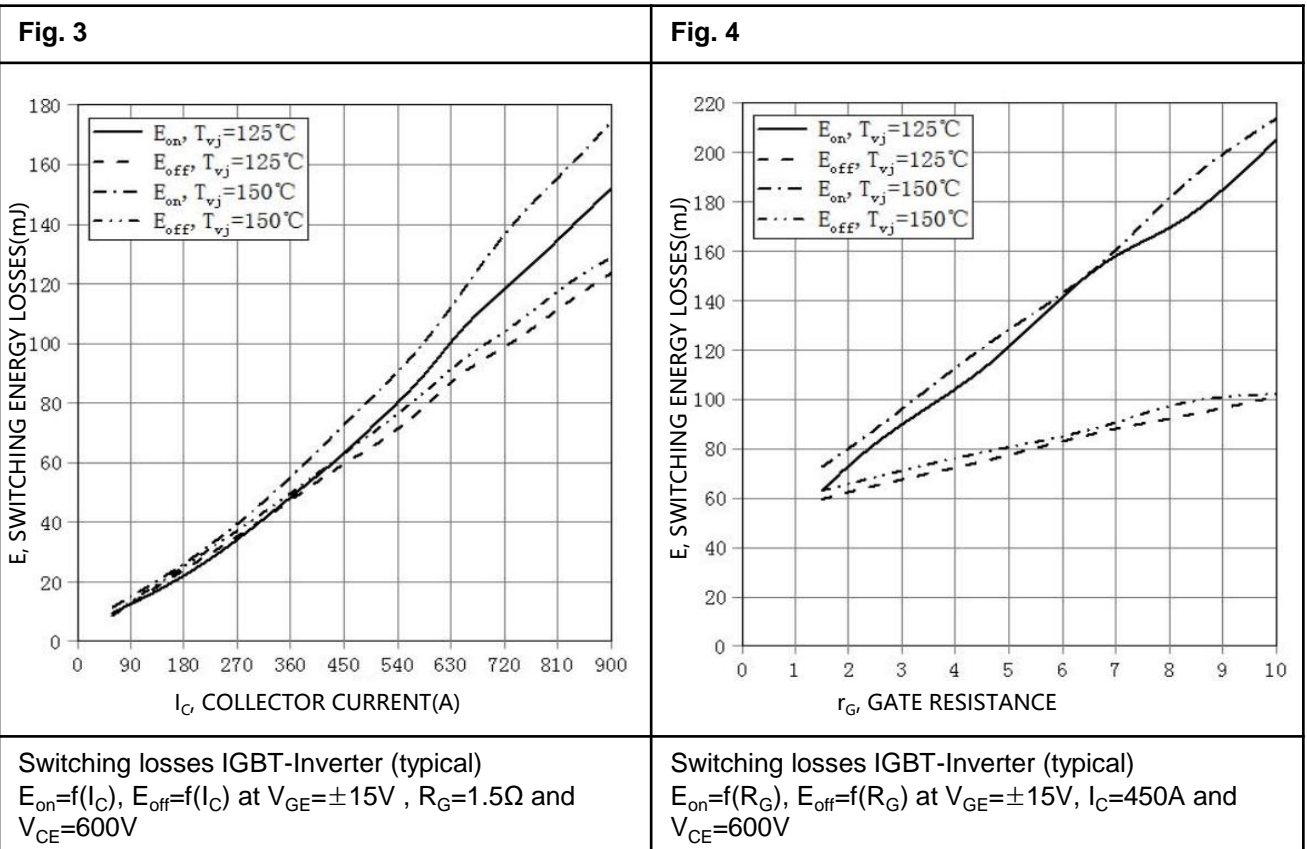
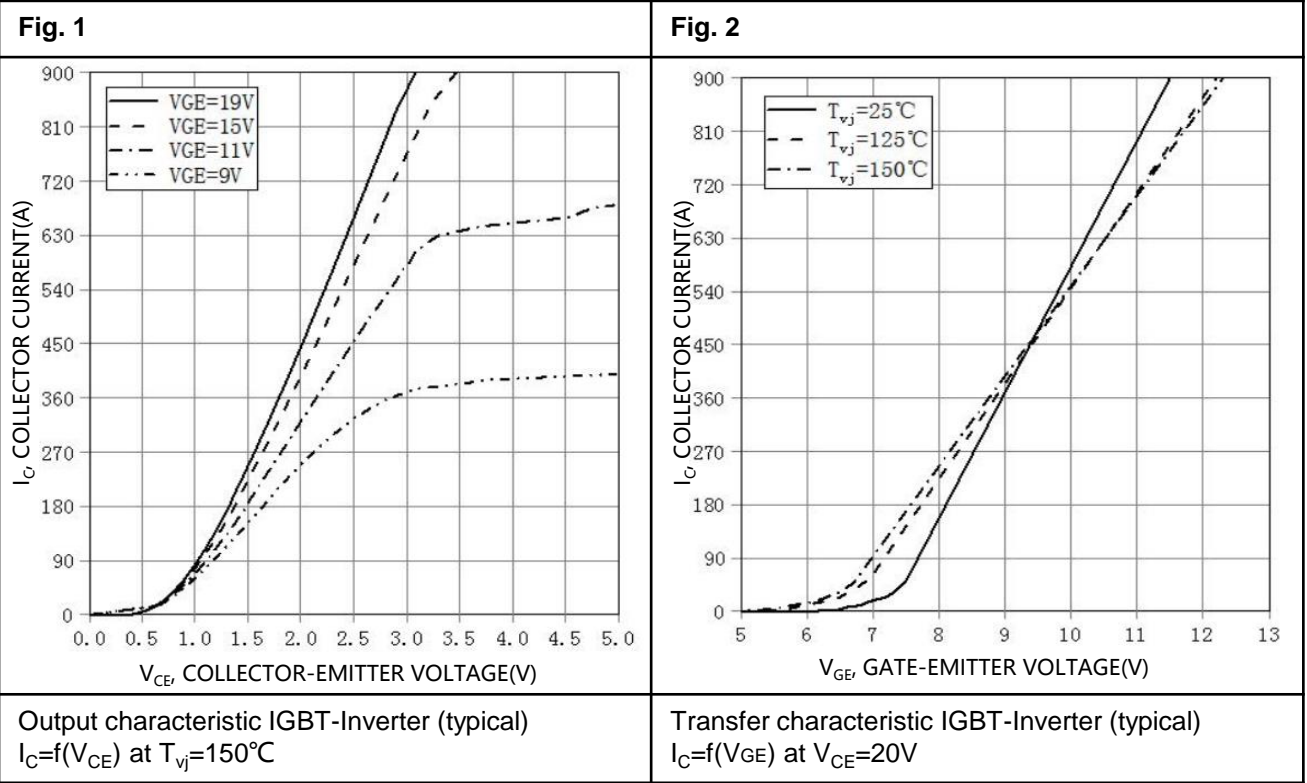
Symbol	Description	Conditions	Values			Unit
			Min.	Typ.	Max.	
V <sub>F</sub>	Forward Voltage	I <sub>F</sub> =450A, V <sub>GE</sub> =0V, T <sub>vj</sub> =25°C	---	2.09	---	V
		I <sub>F</sub> =450A, V <sub>GE</sub> =0V, T <sub>vj</sub> =125°C	---	1.81	---	V
I <sub>RM</sub>	Peak Reverse Recovery Current	I <sub>F</sub> =450A, V <sub>R</sub> =600V, V <sub>GE</sub> =-15V T <sub>vj</sub> =25°C	---	192	---	A
Q <sub>r</sub>	Recovered Charge		---	47	---	uC
E <sub>rec</sub>	Reverse Recovery Energy		---	21.8	---	mJ
T <sub>VJ OP</sub>	Virtual Junction Temperature	Under Switching	-40	---	150	°C

## Module

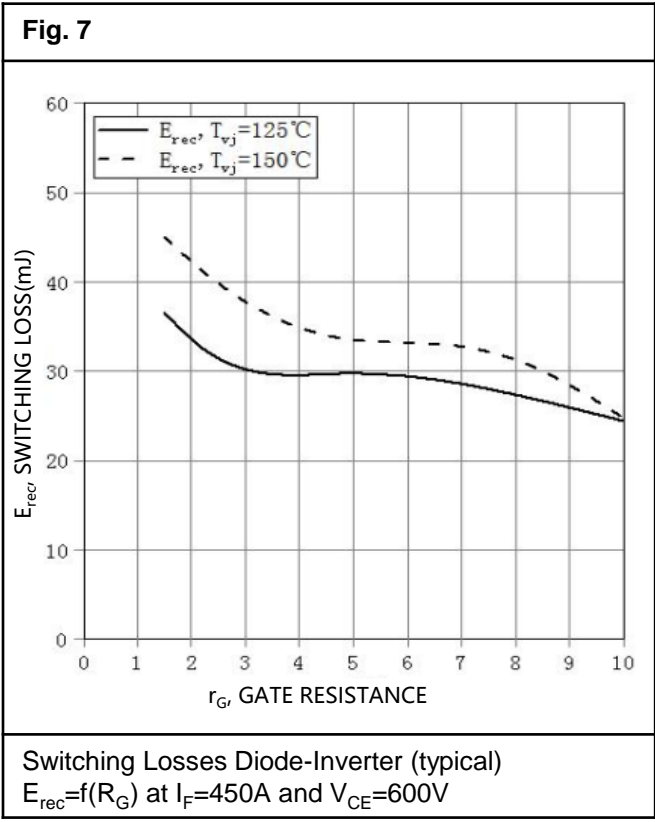
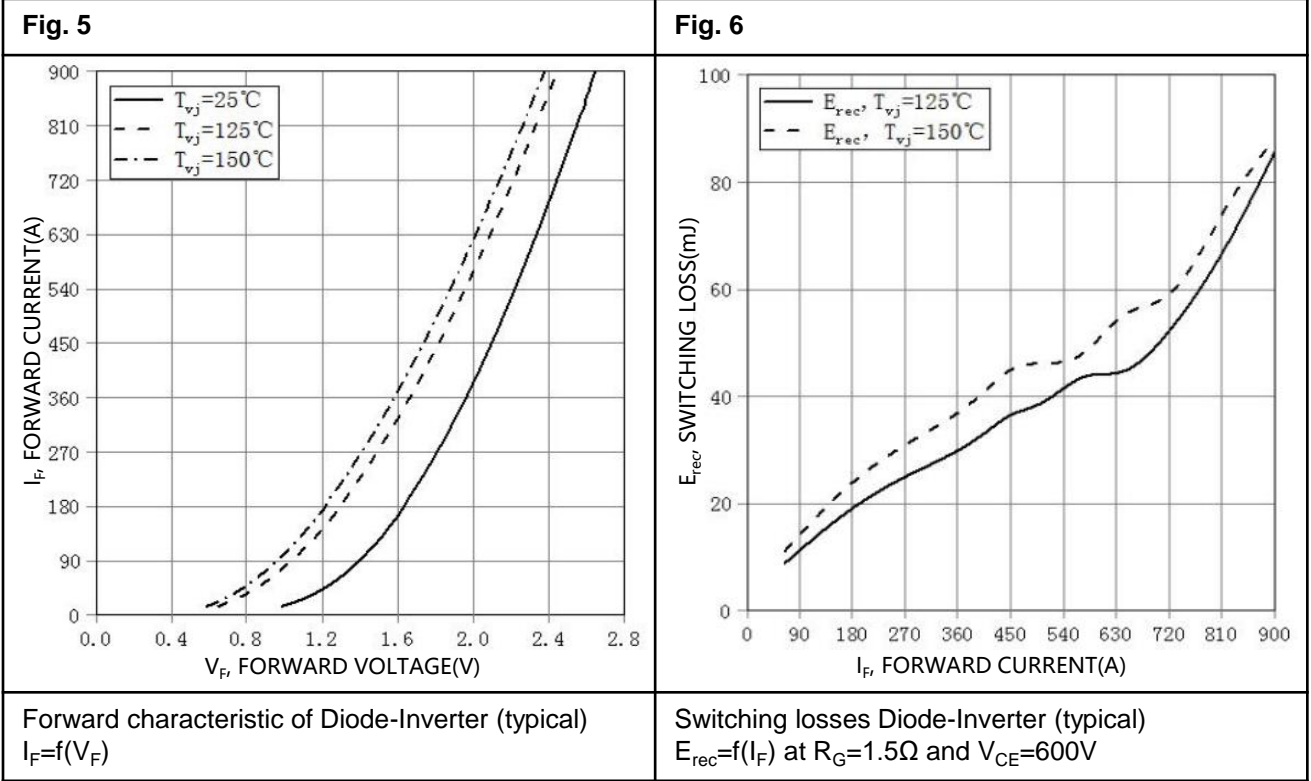
Symbol	Description	Conditions	Values	Unit
V <sub>ISOL</sub>	Isolation Test Voltage	RMS, f=50Hz, t=1min	4.0	KV
	Material of Module Baseplate		Cu	
	Internal Isolation	Basic Insulation (Class 1, IEC 61140)	Al <sub>2</sub> O <sub>3</sub>	
	Creepage Distance	Terminal to Terminal	23.1	mm
	Clearance	Terminal to Terminal	11	mm
CTI	Comparative Tracking Index		> 400	

Symbol	Description	Conditions	Values			Unit
			Min.	Typ.	Max.	
L <sub>sCE</sub>	Stray inductance module		---	22	---	nH
R <sub>CC'+EE'</sub>	Module lead resistance, terminals-chip	Per switch, T <sub>C</sub> =25°C	---	0.8	---	mΩ
T <sub>stg</sub>	Storage Temperature		-40	---	125	°C
M	Mounting Torque for Modul Mounting		3.0	---	6.0	Nm
G	Weight		---	324	---	g

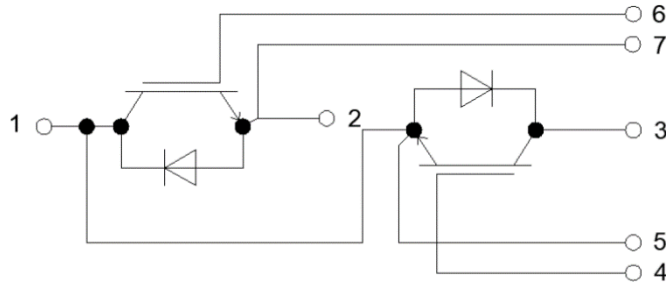
# Typical Characteristics



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## Circuit Diagram



## Package Outlines (mm)

