

34mm module with fast Trench/Fieldstop IGBT and Fast Recovery Diode

Features

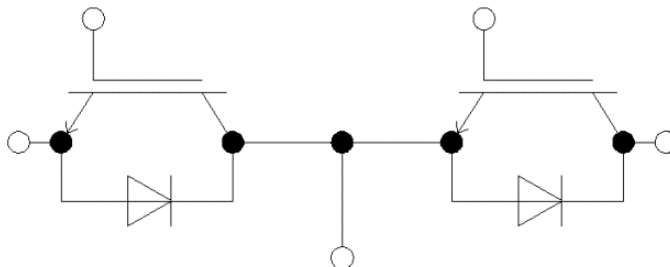
- Low Switching Losses
- Low V_{CEsat}
- Low $V_{CE(sat)}$ with Positive Temperature Coefficient

Applications

- Motor Drives
- Electromagnetic induction heating
- High Power Inverter



Equivalent Circuit Schematic



IGBT - Inverter

Maximum Rated Values

Symbol	Description	Conditions	Values	Unit
V_{CES}	Collector-Emitter Voltage	$T_{vj}=25^{\circ}C$	650	V
V_{GES}	Gate-Emitter Peak Voltage	$T_{vj}=25^{\circ}C$	± 20	V
I_C	Continuous DC Collector Current	$T_C=100^{\circ}C$	200	A
I_{CRM}	Repetitive Peak Collector Current	$t_p=1ms$	400	A
P_{tot}	Total Power Dissipation	$T_C=25^{\circ}C, T_{vj\ max}=175^{\circ}C$	735	W

Characteristic Values

Symbol	Description	Conditions	Values			Unit
			Min.	Typ.	Max.	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$V_{GE}=15V, I_C=200A, T_{vj}=25^{\circ}C$	---	2.1	--	V
		$V_{GE}=15V, I_C=200A, T_{vj}=125^{\circ}C$	---	2.3	--	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE}=V_{CE}, I_C=3.2mA$	5.2	5.7	6.8	V
I_{CES}	Collector-Emitter Cut-Off Current	$V_{CE}=650V, V_{GE}=0V$	---	---	1	μA
I_{GES}	Gate-Emitter Leakage Current	$V_{GE}=30V, V_{CE}=0V$	---	---	500	nA
R_{Gint}	Internal Gate Resistor	$T_{vj}=25^{\circ}C$	---	1.7	---	Ω
C_{ies}	Input Capacitance	$V_{CE}=25V, V_{GE}=0V, f=1MHz$	---	14.5	---	nF
C_{res}	Reverse Transfer Capacitance		---	0.26	---	nF
$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=300V$ $V_{GE}=\pm 15V$ $I_C=200A$ $R_G=8.2\Omega$ Inductive Load $T_{vj}=25^{\circ}C$	---	130	---	ns
t_r	Turn-on Rise Time		---	90	---	ns
$t_{d(off)}$	Turn-off Delay Time		---	330	---	ns
t_f	Turn-off Fall Time		---	90	---	ns
E_{on}	Turn-on Switching Loss		---	1.6	---	mJ
E_{off}	Turn-off Switching Loss		---	9.5	---	mJ
I_{SC}	Short Circuit Data	$V_{GE}\leq 15V, V_{CC}=360V$ $t_p\leq 10\mu s, T_{vj}\leq 125^{\circ}C$	---	900	---	A
R_{thJC}	Thermal Resistance, Junction to Case	Per IGBT	---	---	0.17	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	$T_{vj}=25^{\circ}C$	650	V
I_F	Continuous DC forward current		200	A
I_{FRM}	Repetitive Peak Collector Current	$t_p=1ms$	400	A

Characteristic Values

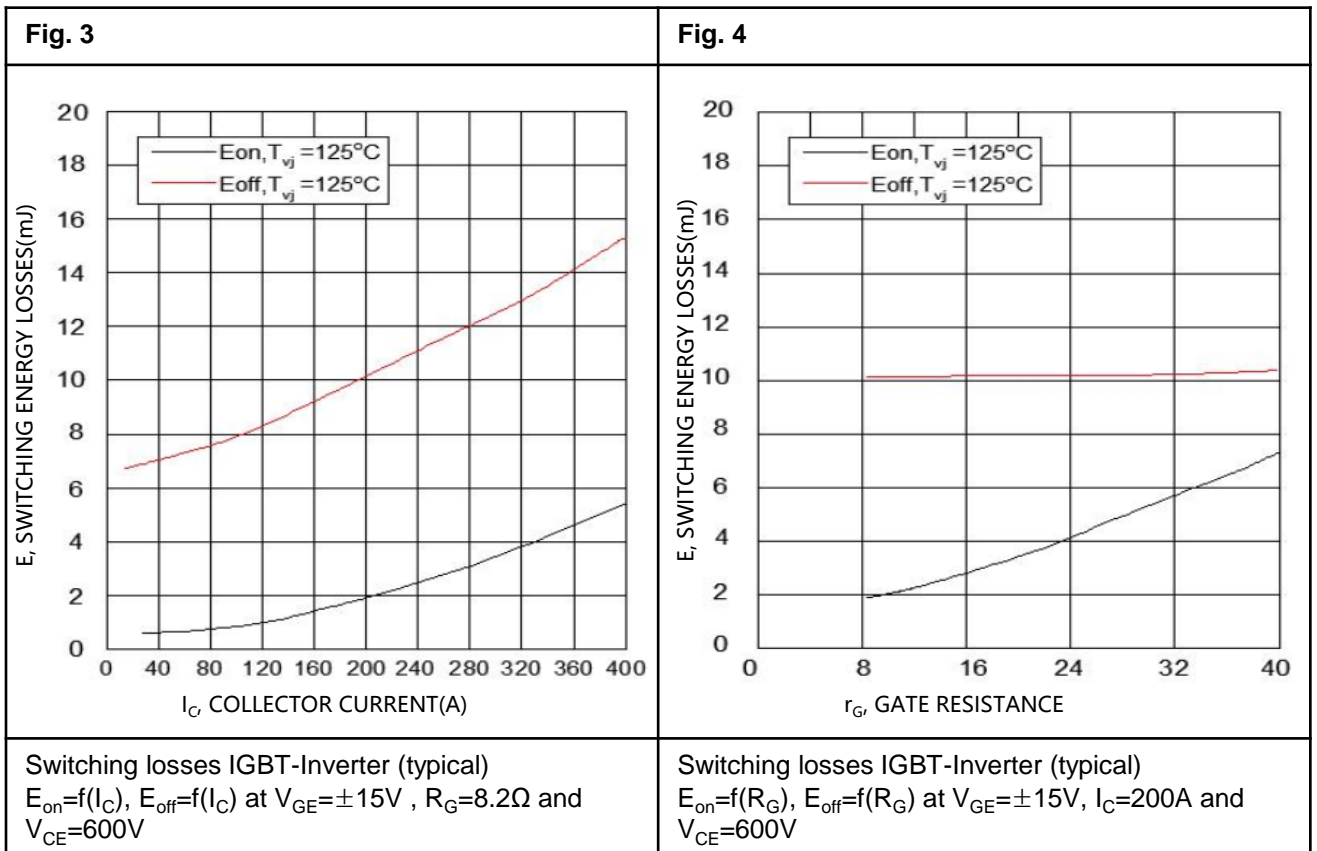
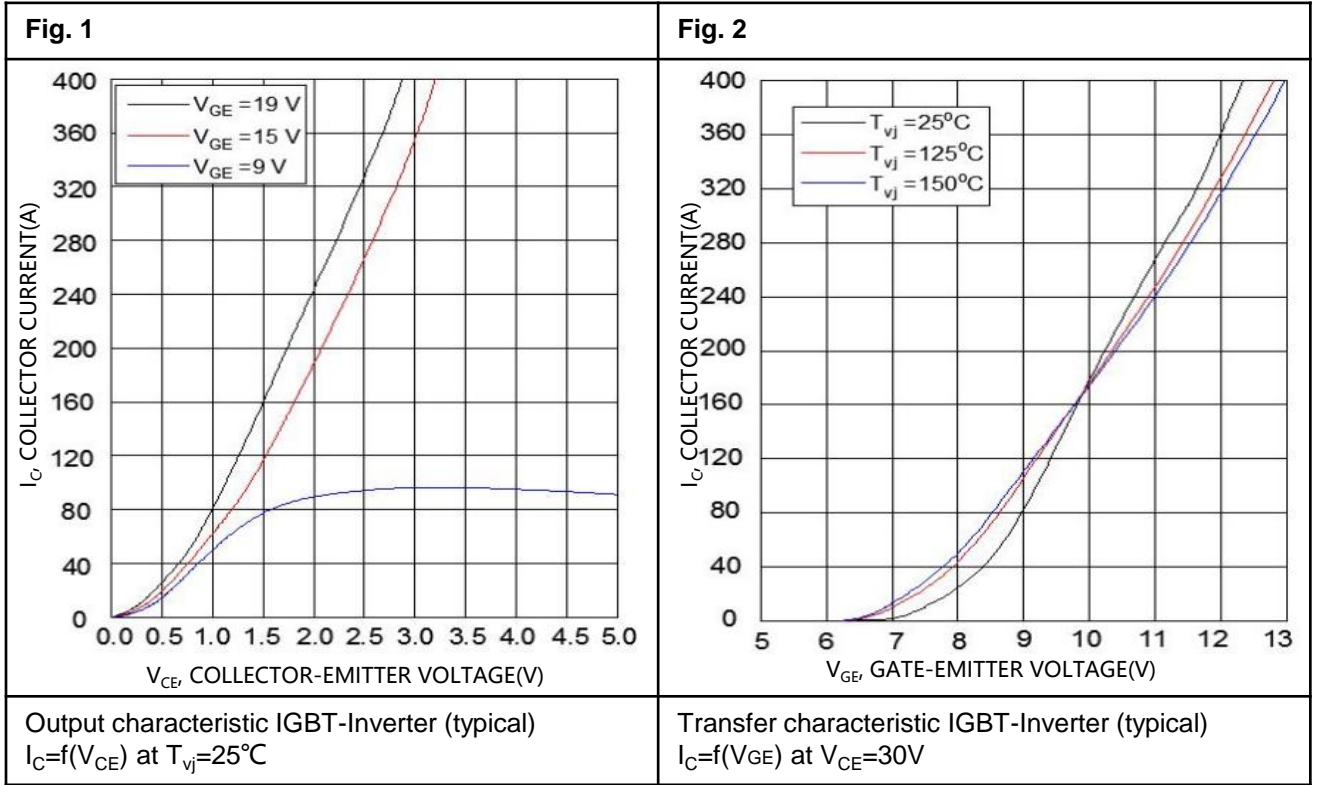
Symbol	Description	Conditions	Values			Unit
			Min.	Typ.	Max.	
V _F	Forward Voltage	I _F =200A, V _{GE} =0V, T _{vj} =25°C	---	1.71	---	V
		I _F =200A, V _{GE} =0V, T _{vj} =125°C	---	1.66	---	V
I _{RM}	Peak Reverse Recovery Current	I _F =200A, V _R =300V, V _{GE} =-15V T _{vj} =25°C	---	154	---	A
Q _r	Recovered Charge		---	12.2	---	uC
E _{rec}	Reverse Recovery Energy		---	3.5	---	mJ
R _{thJC}	Thermal Resistance, Junction to Case	Per Diode	---	---	0.29	K/W
T _{VJ OP}	Virtual Junction Temperature	Under Switching	-40	---	150	°C

Module

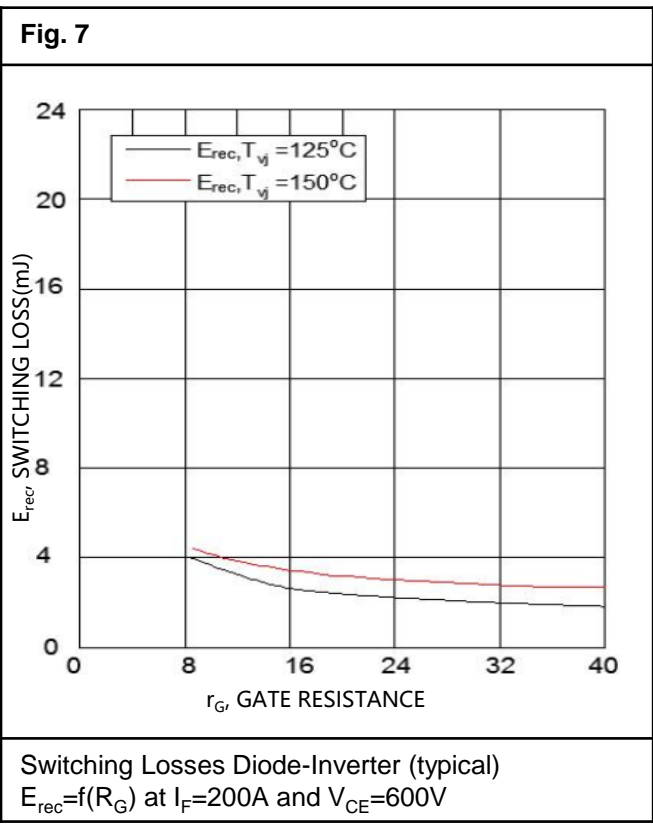
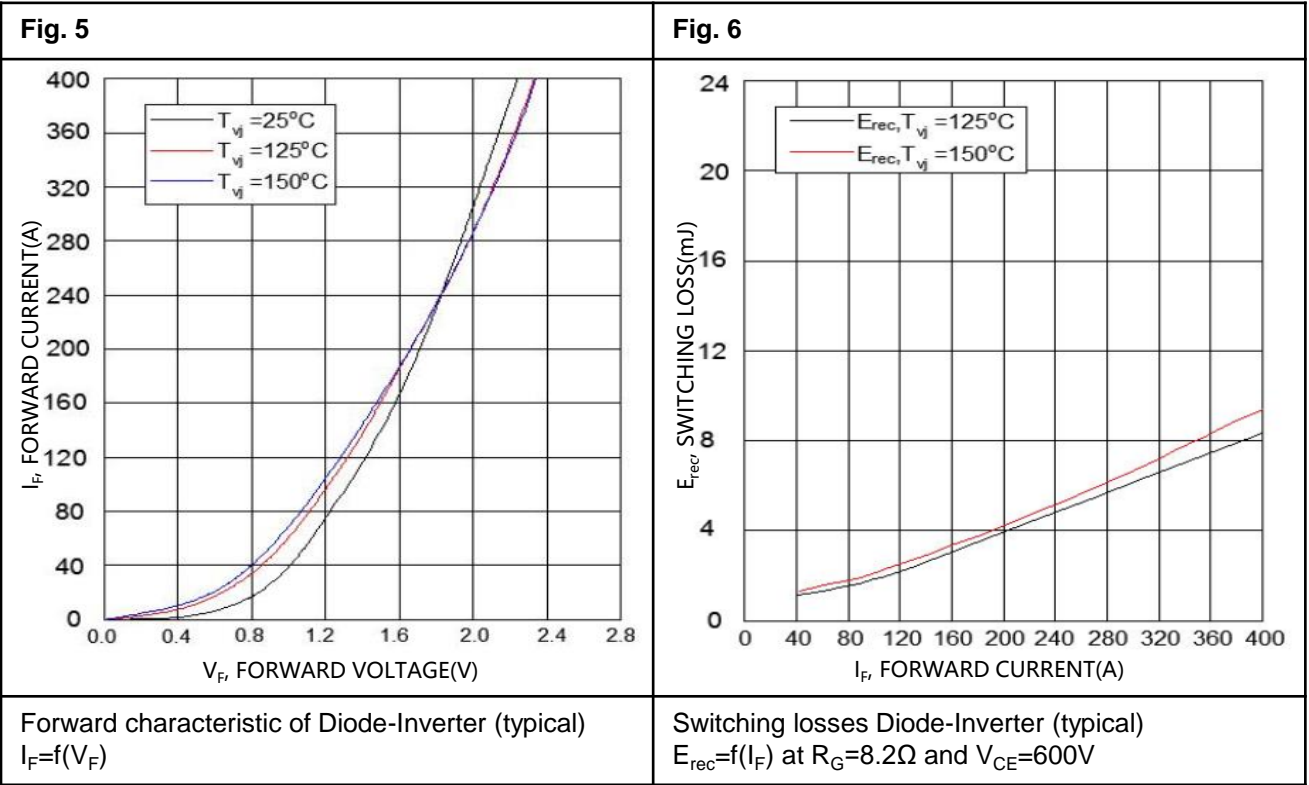
Symbol	Description	Conditions	Values	Unit
V _{ISOL}	Isolation Test Voltage	RMS, f=50Hz, t=1min	3.0	KV
	Material of Module Baseplate		Cu	
	Internal Isolation	Basic Insulation (Class 1, IEC 61140)	Al ₂ O ₃	
	Creepage Distance	Terminal to Heatsink	17.1	mm
		Terminal to Terminal	20.1	
	Clearance	Terminal to Heatsink	17.1	mm
		Terminal to Terminal	9.5	
CTI	Comparative Tracking Index		> 200	

Symbol	Description	Conditions	Values			Unit
			Min.	Typ.	Max.	
R _{thCH}	Thermal Resistance, Case to Heatsink	Per Module λ _{Paste} =1W/(m·k) / λ _{Grease} =1W/(m·k)	---	0.05	---	K/W
L _{sCE}	Stray inductance module		---	29.2	---	nH
R _{CC'+EE'}	Module lead resistance, terminals-chip	Per switch, T _C =25°C	---	0.66	---	mΩ
T _{stg}	Storage Temperature		-40	---	125	°C
M	Mounting Torque for Modul Mounting		3.0	---	5	Nm
G	Weight		---	158	---	g

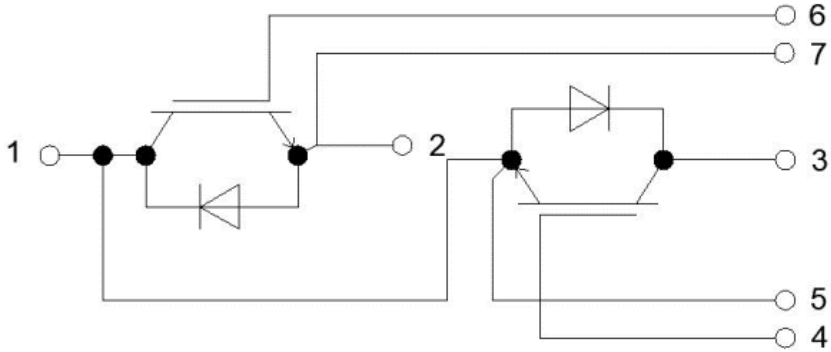
Typical Characteristics



Typical Characteristics



Circuit Diagram



Package Outlines (mm)

