



GT75FF170T6H

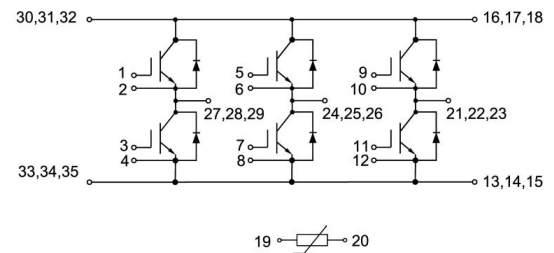
IGBT Module

Preliminary Datasheet

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
- UPS Systems

IGBT, Inverter

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

V _{CES}	Collector-Emitter Blocking Voltage		1700	V
V _{GES}	Gate-Emitter Voltage		±20	V
I _C	Continuous Collector Current	T _C =100°C	75	A
		T _C =25°C	150	A
I _{CM}	Peak Collector Current Repetitive	t _p =1ms	150	A
P _D	Maximum Power Dissipation (IGBT)	T _C =25°C T _{Jmax} =175°C	694	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	$I_C=3\text{mA}$, $V_{CE}=V_{GE}$	5.0		6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=75\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^{\circ}\text{C}$	1.80		V
			$T_J=125^{\circ}\text{C}$	2.20		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	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{kHz}$		6.70		nF
C_{oes}	Output Capacitance			TBD		nF
C_{res}	Reveres Transfer Capacitance			0.03		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=900V, I_c=75A,$ $R_{Gon}=6.8\Omega, V_{GE}=\pm 15V,$ Inductive Load	$T_J=25^{\circ}C$		140		ns
			$T_J=125^{\circ}C$		150		
t_r	Rise Time		$T_J=25^{\circ}C$		120		ns
			$T_J=125^{\circ}C$		125		
$t_{d(off)}$	Turn-off Delay Time	$V_{CC}=900V, I_c=75A,$ $R_{Goff}=6.8\Omega, V_{GE}=\pm 15V,$ Inductive Load	$T_J=25^{\circ}C$		420		ns
			$T_J=125^{\circ}C$		470		
t_f	Fall Time		$T_J=25^{\circ}C$		360		ns
			$T_J=125^{\circ}C$		460		
E_{on}	Turn-on Switching Loss	$V_{CC}=900V, I_c=75A,$ $R_{Gon}=6.8\Omega, V_{GE}=\pm 15V,$ $di/dt=TDBA/\mu s,$ Inductive Load	$T_J=25^{\circ}C$		30		mJ
			$T_J=125^{\circ}C$		35		
E_{off}	Turn-off Switching Loss		$T_J=25^{\circ}C$		16		mJ
			$T_J=125^{\circ}C$		20		
Q_g	Total Gate Charge	$V_{GE}=+15V...-15V$	$T_J=25^{\circ}C$		TBD		nC
$R_{G(int)}$	Internal Gate Resistor		$T_J=25^{\circ}C$		6.0		Ω
I_{SC}	$V_{CC}=900V, V_{GE}=\pm 15V, T_J=150^{\circ}C$			10			μs
$R_{\theta JC}$	Thermal Resistance: Junction-to-Case (per IGBT)					0.22	$^{\circ}C/W$



Diode, Inverter

Maximum Rated Values ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

V_{RRM}	Repetitive Peak Reverse Voltage	$T_J=25^{\circ}\text{C}$	1700	V
I_F	Diode Continuous Forward Current		75	A
I_{FM}	Peak Diode Current Repetitive	$t_p=1\text{ms}$	150	A

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

Symbol	Description	Conditions		Min.	Typ.	Max.	Units	
V _{FM}	Forward Voltage	I _F =75A	T _J =25°C		1.85		V	
			T _J =125°C		2.15			
t _{rr}	Reverse Recovery Time	I _F =75A, -diF/dt=1685A/μs, V _R =900V, V _{GE} =-15V	T _J =25°C		294		ns	
			T _J =125°C		721			
I _{rr}	Peak Reverse Recovery Current		T _J =25°C		78.8		A	
			T _J =125°C		92.5			
Q _{rr}	Reverse Recovery Charge		T _J =25°C		10.3		μC	
			T _J =125°C		19.8			
E _{rec}	Reverse Recovery Energy		T _J =25°C		6.0		mJ	
			T _J =125°C		13.4			
R _{θJC}	Thermal Resistance: Junction-to-Case (per Diode)					0.55	°C/W	

Internal NTC-Thermistor Characteristics

Symbol	Description	Min.	Typ.	Max.	Units
R_{25}	$T_C=25^{\circ}\text{C}$		5		$\text{k}\Omega$
$\Delta R/R$	$T_C=100^{\circ}\text{C}$, $R_{100}=465\Omega$	-5		5	%
P_{25}	$T_C=25^{\circ}\text{C}$			10	mW
$B_{25/50}$	$R_2=R_{25} \exp[B_{25/50}(1/T_2-1/(298.15\text{K}))]$		3380		K
$B_{25/80}$	$R_2=R_{25} \exp[B_{25/80}(1/T_2-1/(298.15\text{K}))]$		3440		K
$B_{25/100}$	$R_2=R_{25} \exp[B_{25/100}(1/T_2-1/(298.15\text{K}))]$		3545		K



Module

Symbol	Description	Conditions	Min.	Typ.	Max.	Units
V _{iso}	Isolation Voltage (All Terminals Shorted)	f=50Hz, 1minute	3400			V
T _J	Maximum Junction Temperature				175	°C
T _{JOP}	Maximum Operating Junction Temperature Range		-40		+150	°C
T _{stg}	Storage Temperature		-40		+125	°C
CTI	Comparative Tracking Index		200			
R _{θCS}	Case-to-Sink Thermally (Conductive Grease Applied)				0.03	°C/W
T	Mounting Screw:M5		3.0		6.0	N·m
G	Weight			300		g

Ordering Information Table

Device code	G	T	75	FF	170	T6	H
	①	②	③	④	⑤	⑥	⑦

- ① - IGBT Module
- ② - Trench, Low Switching Losses IGBT
- ③ - Rated Current (75=75A)
- ④ - Circuit Configuration (Full Bridge)
- ⑤ - Rated Voltage (170=1700V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)



Revision	Notes
01	Initial Release

Announcement

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The datasheet with “REV.” + “Arabic numerals” is based on engineering data for initial reference purpose only.

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