November 2013



FGH80N60FD 600 V Field Stop IGBT

Features

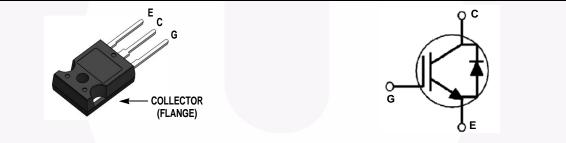
- High Current Capability
- Low Saturation Voltage: V_{CE(sat)} = 1.8 V @ I_C = 40 A
- High Input Impedance
- Fast Switching
- RoHS Complaint

Applications

Induction Heating, PFC, Telecom, ESS

General Description

Using novel field stop IGBT technology, Fairchild's field stop IGBTs offer the optimum performance for induction heating, telecom, ESS and PFC applications where low conduction and switching losses are essential.



Absolute Maximum Ratings

Symbol	Description		Ratings	Unit
V _{CES}	Collector-Emitter Voltage		600	V
V _{GES}	Gate-Emitter Voltage		± 20	V
I _C	Collector Current	@ T _C = 25°C	80	A
	Collector Current	@ T _C = 100°C	40	A
I _{CM (1)}	Pulsed Collector Current	@ T _C = 25°C	160	A
P _D	Maximum Power Dissipation	@ T _C = 25°C	290	W
·D	Maximum Power Dissipation	@ T _C = 100°C	116	W
Т _Ј	Operating Junction Temperature		-55 to +150	°C
T _{stg}	Storage Temperature Range		-55 to +150	°C
TL	Maximum Lead Temp. for soldering Purposes, 1/8" from case for 5 seconds		300	°C

Notes :

(1) Repetitive rating : Pulse width limited by max. junction temperature

Thermal Characteristics

Symbol	Parameter	Тур.	Max.	Unit
$R_{\theta JC}$ (IGBT)	Thermal Resistance, Junction-to-Case		0.43	°C/W
$R_{\theta JC}$ (Diode)	Thermal Resistance, Junction-to-Case		1.5	°C/W
$R_{ extsf{ heta}JA}$	Thermal Resistance, Junction-to-Ambient		40	°C/W

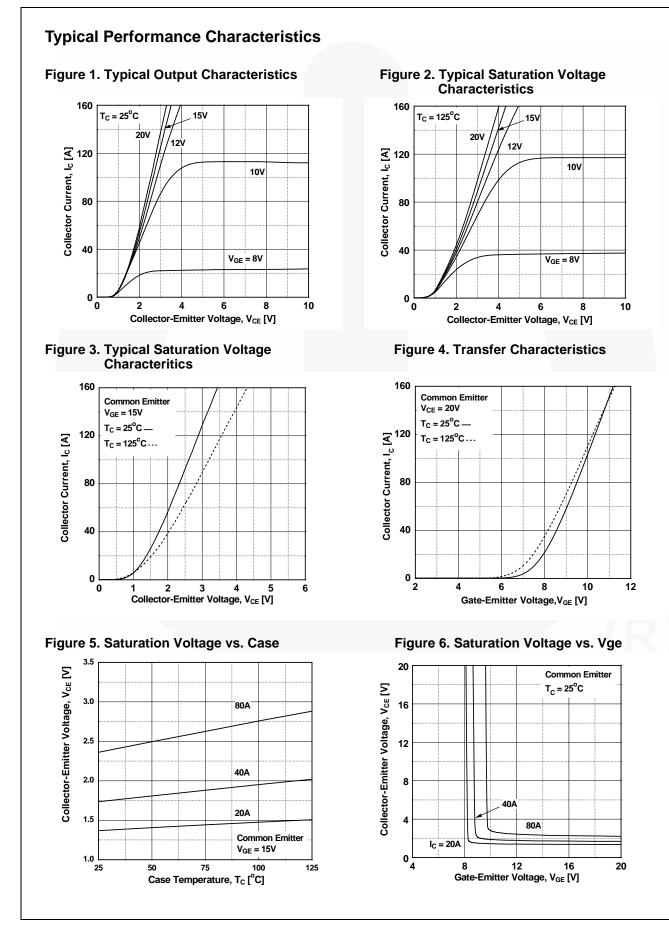
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Part NumberTop MarkPackageFGH80N60FDTUFGH80N60FDTO-247		Package	Packing Method	Reel Size	Tape Wi	dth Q	uantity	
		Tube	N/A	N/A		30		
Electric	al Cha	aracteristics	of the IG	BT $T_{C} = 25^{\circ}C$ unless otherw	vise noted			
Symbol		Parameter		Test Condition	s Min.	Тур.	Max.	Unit
Off Charac	teristics							
BV _{CES}		r-Emitter Breakdov	n Voltage	V _{GE} = 0 V, I _C = 250 uA	600			V
ΔBV _{CES} / ΔT _{.1}		ature Coefficient of		$V_{GE} = 0 V, I_C = 250 uA$		0.6		V/°C
ICES	Collecto	r Cut-Off Current		V _{CE} = V _{CES} , V _{GE} = 0 V			250	uA
I _{GES}	G-E Lea	kage Current		$V_{GE} = V_{GES}, V_{CE} = 0 V$			±400	nA
On Charac	teristics		¥		l.			
V _{GE(th)}		eshold Voltage		I _C = 250 uA, V _{CE} = V _{GE}	4.5	5.5	7.0	V
GE(III)	_		-	$I_{\rm C} = 40$ A, $V_{\rm GE} = 15$ V		1.8	2.4	V
V _{CE(sat)}	Collector to Emitter Saturation Voltage			$I_{C} = 40 \text{ A}, V_{GE} = 15 \text{ V},$ $T_{C} = 125^{\circ}\text{C}$		2.05		V
Dynamic C	haracteri	istics	I		I			
C _{ies}		apacitance				2110		pF
C _{oes}		Capacitance		$V_{CE} = 30 V, V_{GE} = 0 V,$		200		pF
C _{res}	Reverse	Transfer Capacita		f = 1 MHz		60		pF
Switching	Characte	ristics	U		L			
t _{d(on)}	Turn-On Delay Time Rise Time				21		ns	
t _r					56		ns	
t _{d(off)}	Turn-Off	n-Off Delay Time		V _{CC} = 400 V, I _C = 40 A,		126		ns
4(0.1) t _f	Fall Tim			$R_{G} = 10 \Omega$, $V_{GE} = 15 V$,		50	100	ns
E _{on}	Turn-On	Switching Loss		Inductive Load, $T_C = 25^{\circ}C$		1	1.5	mJ
E _{off}	Turn-Off	Switching Loss				0.52	0.78	mJ
E _{ts}	Total Sw	vitching Loss				1.52	2.28	mJ
t _{d(on)}	Turn-On	Delay Time				20		ns
t _r	Rise Tim	ne				54		ns
t _{d(off)}	Turn-Off	Turn-Off Delay Time Fall Time Turn-On Switching Loss		V _{CC} = 400 V, I _C = 40 A,		131		ns
t _f	Fall Tim			$R_G = 10 \Omega$, $V_{GE} = 15 V$,		70		ns
E _{on}	Turn-On			Inductive Load, $T_C = 125^\circ$		1.1		mJ
E _{off}	Turn-Off	Switching Loss				0.78		mJ
E _{ts}	Total Sw	vitching Loss				1.88		mJ
Qg	Total Ga	te Charge				120		nC
Q _{ge}	Gate-En	nitter Charge		$V_{CE} = 400 \text{ V}, I_{C} = 40 \text{ A},$ $V_{GE} = 15 \text{ V}$		14		nC
Q _{gc}	Gate-Co	llector Charge		GE - IO V		58		nC

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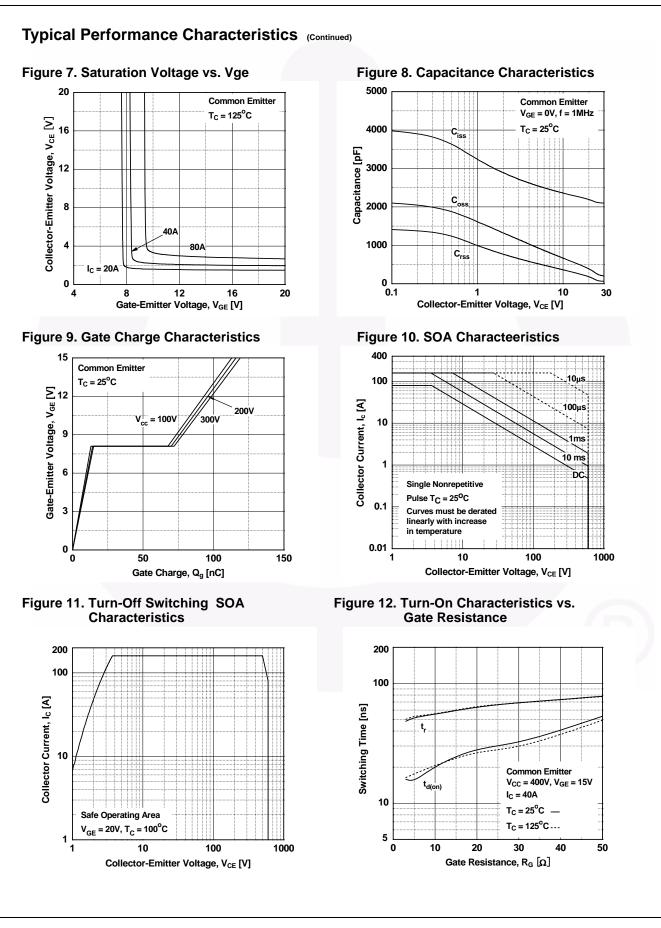
Symbol	Parameter	Test Condition	ons	Min.	Тур.	Max	Unit
V _{FM} Diode Forward Voltage	Diode Forward Voltage	I _F = 20 A	T _C = 25°C	-	2.3	2.8	V
	1F - 20 A	T _C = 125°C	-	1.7	-]	
t _{rr}	Diode Reverse Recovery Time	I _F =20 A, di _F / dt = 200 A/μs	T _C = 25°C	-	36	-	ns A
-11			T _C = 125°C	-	105	-	
l	Diode Reverse Recovery Current		T _C = 25°C	-	2.6	-	
rr			T _C = 125°C	-	7.8	-	
Q _{rr}	Diode Reverse Recovery Charge		T _C = 25°C	-	46.8	-	nC
			T _C = 125°C	-	409	-	

FGH80N60FD — 600 V Field Stop IGBT

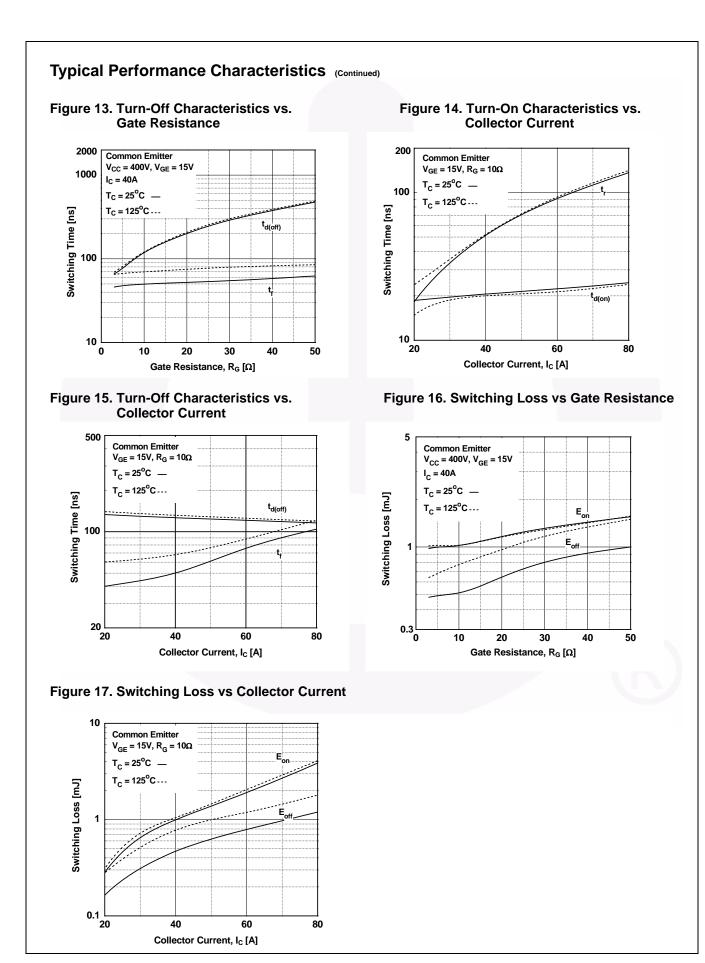


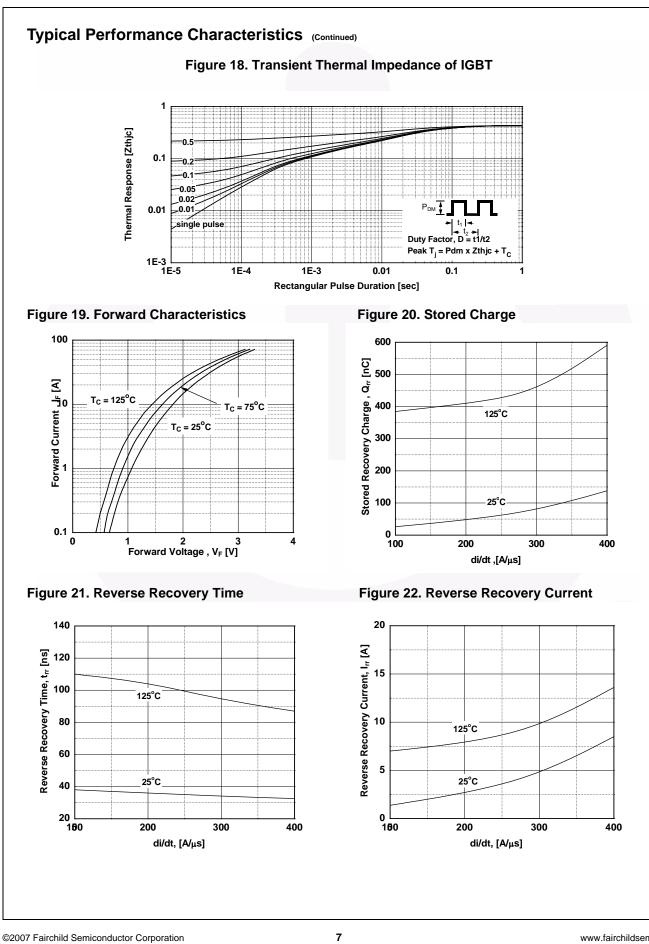
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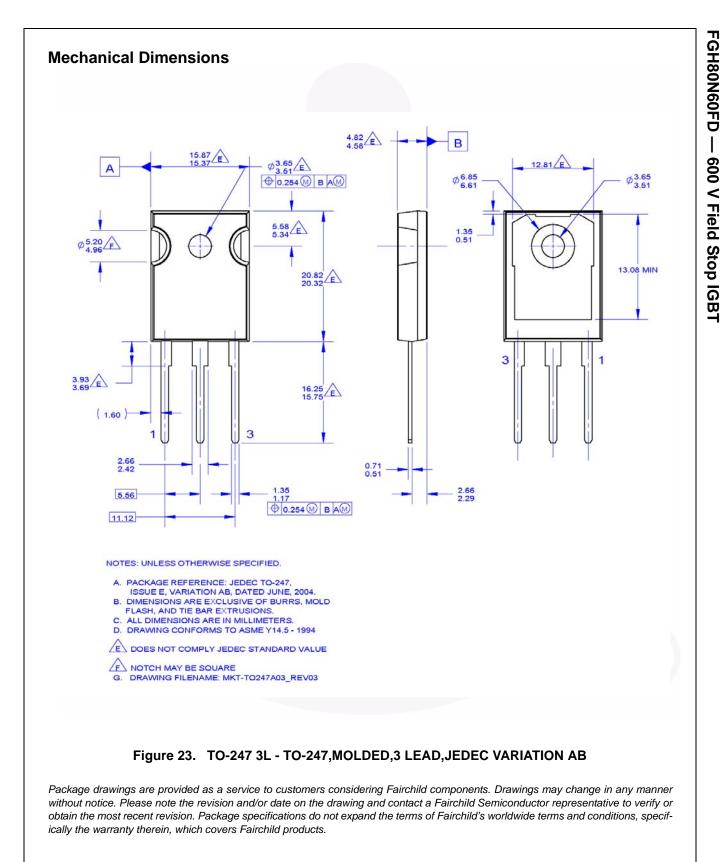


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