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September 2013



FGP10N60UNDF 600 V, 10 A Short Circuit Rated IGBT

Features

- Short Circuit Rated 10 us
- · High Current Capability
- High Input Impedance
- Fast Switching
- · RoHS Compliant

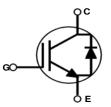
General Description

Using advanced NPT IGBT technology, Fairchild's the NPT IGBTs offer the optimum performance for low-power inverterdriven applications where low-losses and short-circuit ruggedness features are essential, such as sewing machine, CNC, motor control and home appliances.

Applications

· Sewing Machine, CNC, Home Appliances, Motor Control





Absolute Maximum Ratings

Symbol	Descriptio	n	Ratings	Unit
V _{CES}	Collector to Emitter Voltage		600	V
V _{GES}	Gate to Emitter Voltage		± 20	V
I _C	Collector Current	@ T _C = 25°C	20	A
'C	Collector Current	@ T _C = 100°C	10	A
I _{CM (1)}	Pulsed Collector Current	@ T _C = 25°C	30	A
IF	Diode Forward Current	@ T _C = 25°C	10	A
	Diode Forward Current	@ T _C = 100°C	5	А
PD	Maximum Power Dissipation	@ TC = 25oC	139	W
	Maximum Power Dissipation	@ TC = 100oC	56	W
TJ	Operating Junction Temperature		-55 to +150	°C
T _{stg}	Storage Temperature Range		-55 to +150	°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	-	0.9	°C/W
$R_{\theta JC}(Diode)$	Thermal Resistance, Junction to Case	-	3.5	°C/W
$R_{ extsf{ heta}JA}$	Thermal Resistance, Junction to Ambient (PCB Mount)(2)	-	62.5	°C/W

Notes:

2: Mountde on 1" square PCB (FR4 or G-10 material)

•		Package			Width	Quantity		
		TO-220					50ea	
Electric	al Char	acteristics of t	he IGBT T _{c = 2}	5°C unless otherwise noted				
Symbol		Parameter	Test	Test Conditions		Тур.	Max.	Unit
Off Charac	teristics							
BV _{CES}	1	to Emitter Breakdown Vo	oltage V _{GE} = 0 V, I	_C = 250 μA	600	-	-	V
ICES		Cut-Off Current	V _{CE} = V _{CES}	-	-	-	1	mA
I _{GES}	G-E Leak	age Current	V _{GE} = V _{GES}		-	-	±10	uA
			02 020					
On Charac V _{GE(th)}		shold Voltage	I _C = 10 mA,	$V_{CE} = V_{CE}$	5.5	6.8	8.5	V
			$I_{\rm C} = 10$ A, V		-	2	2.45	V
V _{CE(sat)}	Collector	ollector to Emitter Saturation Voltage		$I_{\rm C} = 10$ A, $V_{\rm GE} = 15$ V, $T_{\rm C} = 125^{\circ}$ C		2.3	-	V
Dunamia C	horostorio	tion						
Dynamic C C _{ies}	Input Cap				—	517		pF
C _{oes}		apacitance	V _{CE} = 30 V,	$V_{GE} = 0 V,$	-	65		pF
C _{res}		Fransfer Capacitance	f = 1 MHz		-	20		pF
Switching	Characteri	stics						
t _{d(on)}	1	Delay Time			-	8.0	1	ns
t _r	Rise Time)			-	6.3		ns
t _{d(off)}	Turn-Off	Delay Time	$V_{cc} = 400$ V	V _{CC} = 400 V, I _C = 10 A,		52.2		ns
t _f	Fall Time		R _G = 10 Ω,	V _{GE} = 15 V,	-	19.1	24.8	ns
E _{on}	Turn-On S	Switching Loss	Inductive Lo	bad, $T_C = 25^{\circ}C$	-	0.15		mJ
E _{off}	Turn-Off S	Switching Loss			-	0.05		mJ
E _{ts}	Total Swit	ching Loss			-	0.2		mJ
t _{d(on)}	Turn-On [Delay Time			-	8.1		ns
t _r	Rise Time				-	7.3		ns
t _{d(off)}	Turn-Off	Delay Time	V _{CC} = 400 V	√, I _C = 10 A,	-	55.1		ns
t _f	Fall Time		R _G = 10 Ω,	V _{GE} = 15 V,	-	34.2		ns
Eon	Turn-On S	Switching Loss	Inductive Lo	oad, T _C = 125°C	-	0.22		mJ
E _{off}	Turn-Off S	Switching Loss			-	0.08		mJ
E _{ts}	Total Swit	ching Loss			-	0.3		mJ
T _{sc}	Short Circ	uit Withstand Time	V _{CC} = 350 V R _G = 100 Ω T _C = 150 ^o C	, V _{GE} = 15V ,	10	-	- (μs

Electrical Characteristics of the IGBT T _c = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min.	Тур.	Max	Unit
Qg	Total Gate Charge		-	37		nC
Q _{ge}	Gate to Emitter Charge	V _{CE} = 400 V, I _C = 10 A, V _{GE} = 1 V	-	5		nC
Q _{gc}	Gate to Collector Charge	GE - I V	-	21		nC

Electrical Characteristics of the Diode $T_{C} = 25^{\circ}C$ unless otherwise noted

Symbol	Parameter	Test Conditions		Min.	Тур.	Max	Unit
V _{FM} Diode Forward Vol	Diode Forward Voltage	ge I _F = 10 A	$T_{\rm C} = 25^{\rm o}{\rm C}$	-	1.8	2.2	V
	2.000 Formard Formage		T _C = 125°C	-	1.7		
t	Diode Reverse Recovery Time	I _F = 10 A, dI _F /dt = 200 A/μs	$T_{C} = 25^{\circ}C$	-	37.7		ns
۲r			$T_{\rm C} = 125^{\rm o}{\rm C}$	-	78.9		
Q	Q _{rr} Diode Reverse Recovery Charge		$T_{\rm C} = 25^{\rm o}{\rm C}$	-	75		nC
~m			T _C = 125°C	-	221		

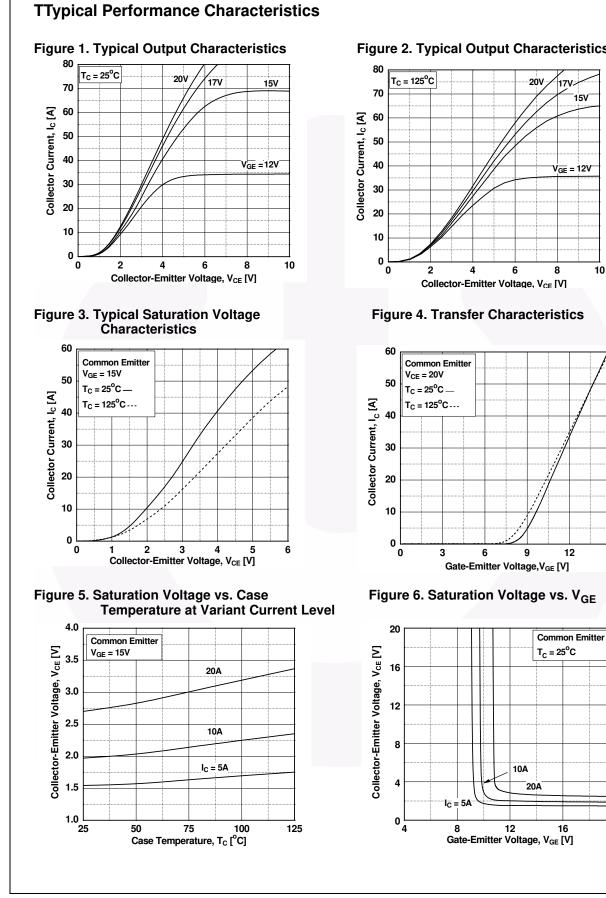
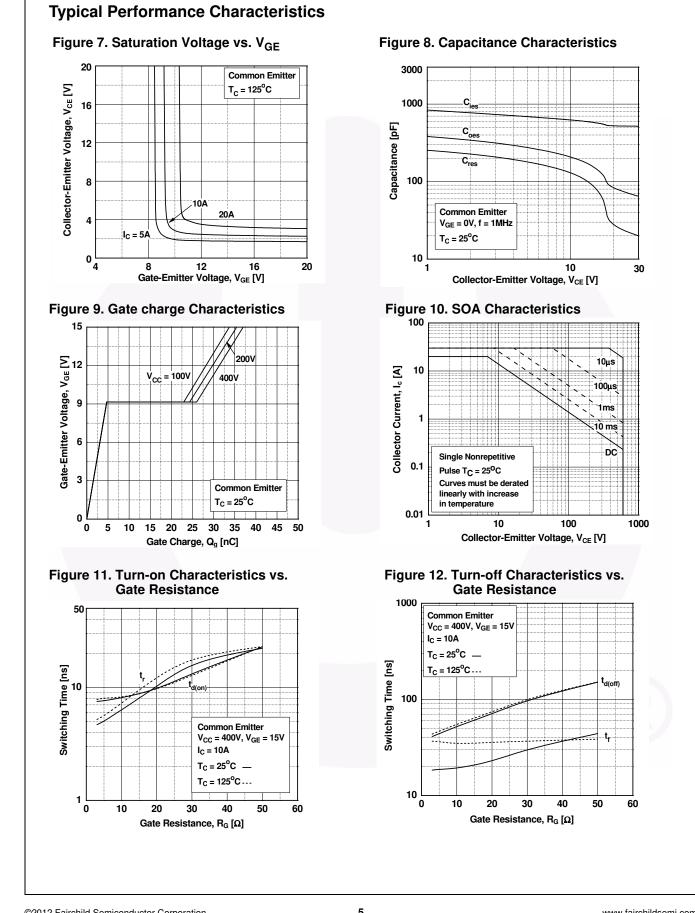


Figure 2. Typical Output Characteristics

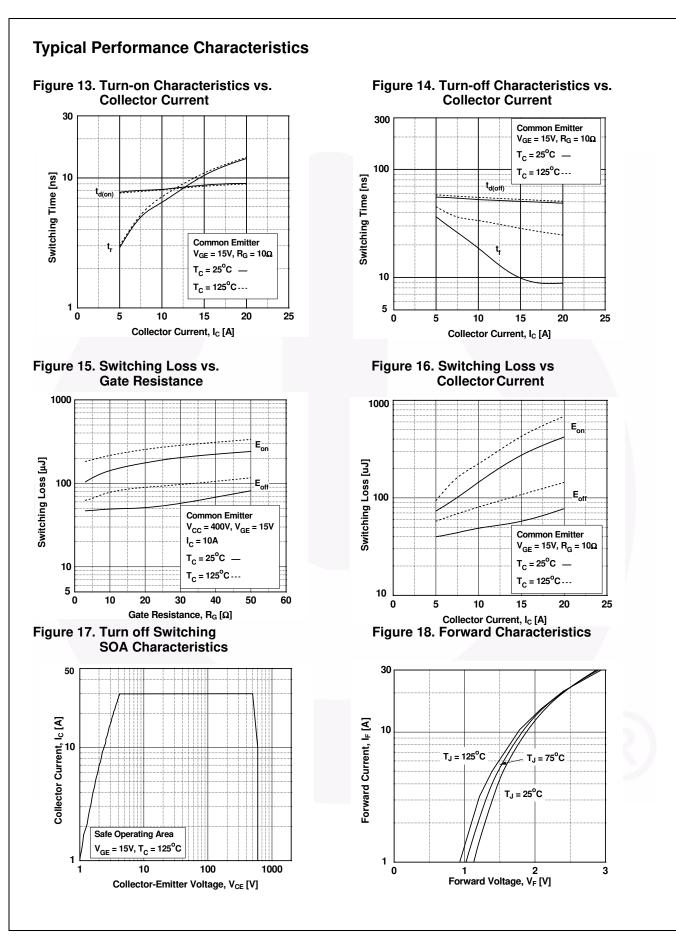
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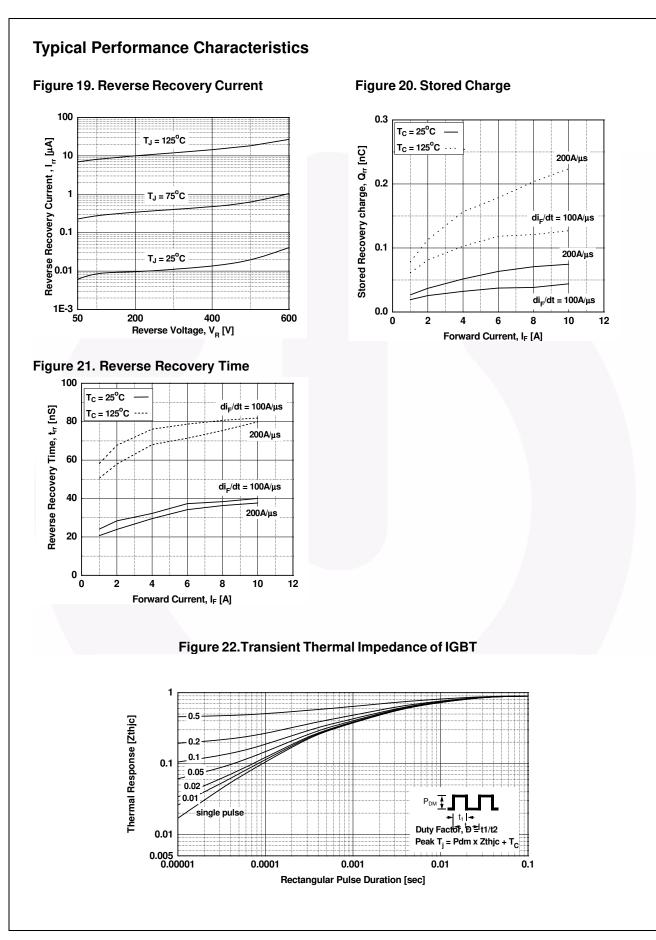
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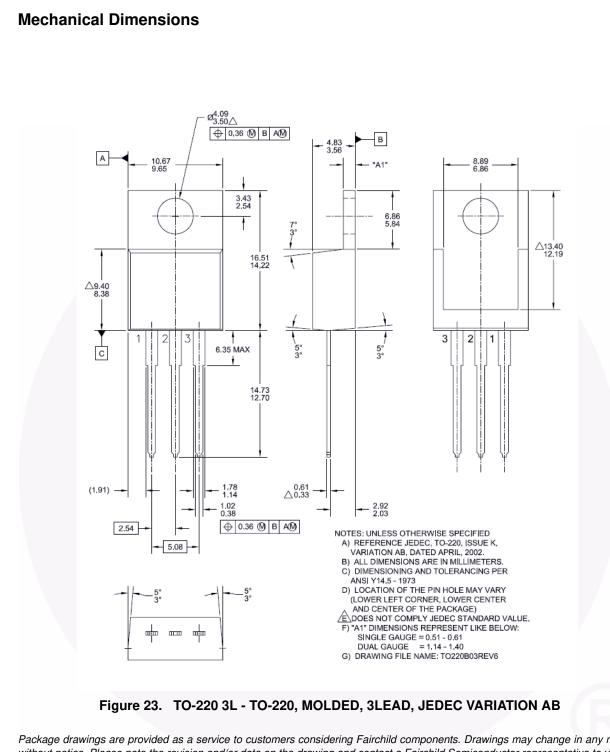


FGP10N60UNDF — 600 V, 10 A Short Circuit Rated IGBT



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Dimensions in Millimeters



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FGP10N60UNDF — 600 V, 10 A Short Circuit Rated IGBT

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