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SGH10N60RUFD 600V, 10 A Short Circuit Rated IGBT

Features

- Short Circuit Rated 10 us @ $T_C = 100^{\circ}C$, $V_{GE} = 15 V$
- High Speed Switching
- Low Saturation Voltage : V_{CE(sat)} = 2.2 V @ I_C = 10 A
- High Input Impedance
- CO-PAK, IGBT with FRD : t_{rr} = 42 ns (typ.)

Applications

AC & DC Motors Controls, General Purpose Inverters, and Robotics, and Servo Controls

Description

Fairchild's RUFD series of insulated gate bipolar transistors (IGBTs) provide low conduction and switching losses as well as short circuit ruggedness. The RUFD series is designed for applications such as motor control, uninterrupted power supplies (UPS) and general inverters where short circuit ruggedness is a required feature.





Absolute Maximum Ratings T_c = 25°C unless otherwise noted.

Symbol	Description		Ratings	Unit
Collector-Emitter Voltage		600	V	
V _{GES}	Gate-Emitter Voltage		± 20	V
	Collector Current @ $T_{C} = 25^{\circ}C$		16	A
I _C Collector Current		@ T _C = 100°C	10	A
I _{CM (1)}	(1) Pulsed Collector Current		30	A
IF	Diode Continuous Forward Current @ $T_C = 100^{\circ}C$		12	A
FM Diode Maximum Forward Current		92	A	
T _{SC} P _D	Short Circuit Withstand Time @ $T_c = 100^{\circ}C$		10	us
P _D	Maximum Power Dissipation	@ T _C = 25°C	75	W
	Maximum Power Dissipation	@ T _C = 100°C	30	W
TJ	Operating Junction Temperature		-55 to +150	°C
T _J T _{stg}	Storage Temperature Range		-55 to +150	°C
TL	Maximum Lead Temp. for Soldering Purposes, 1/8" from Case for 5 Second	300	°C	

Notes :

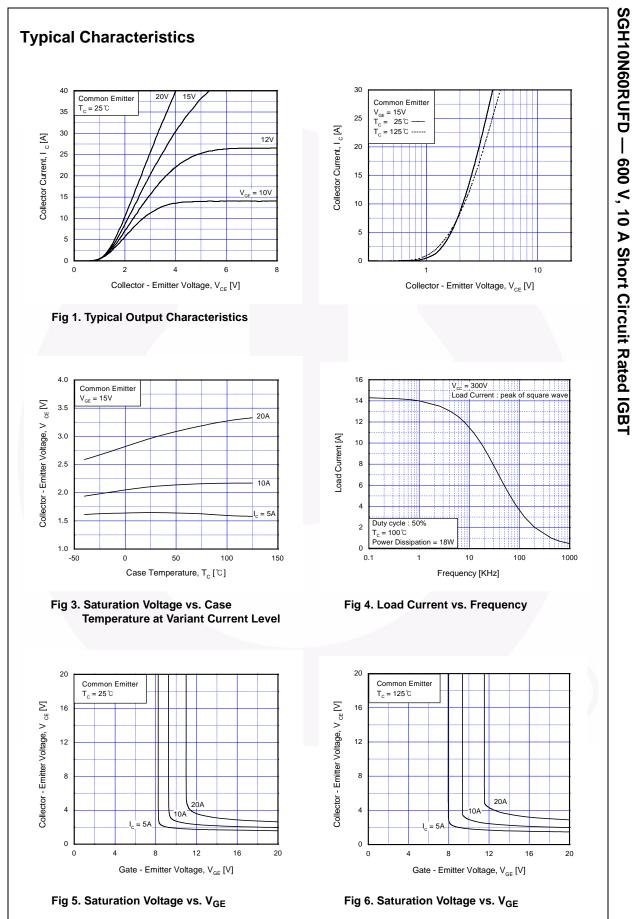
(1) Repetitive rating : Pulse width limited by max. junction temperature

Thermal Characteristics

Symbol	Parameter	Тур.	Max.	Unit
R _{θJC} (IGBT)	Thermal Resistance, Junction-to-Case		1.6	°C/W
R _{0JC} (DIODE) Thermal Resistance, Junction-to-Case			2.5	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient		40	°C/W

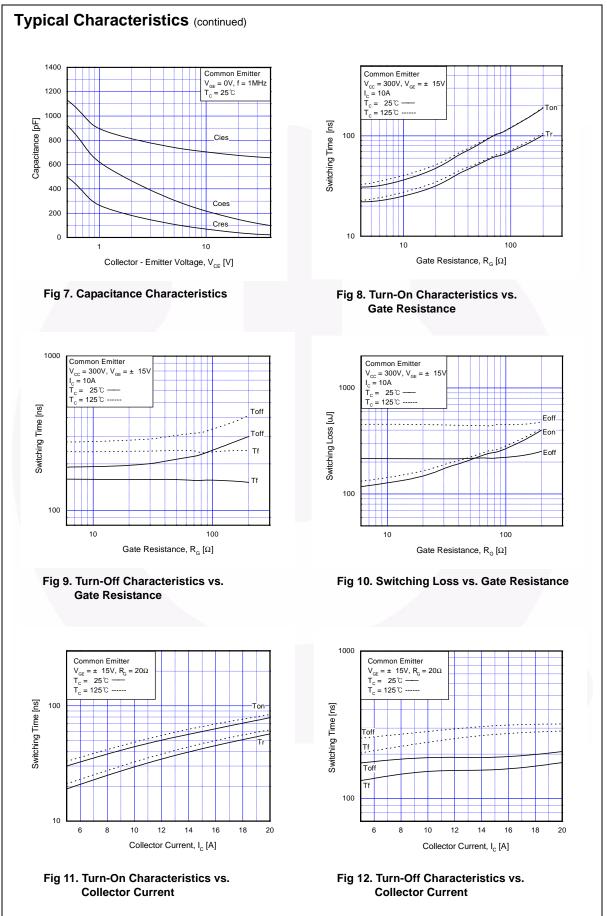
December 2013

Part NumberTop MarkPackageGGH10N60RUFDSGH10N60RUFDTO-3PN		Package	Packing Method Reel Size		e T	ape Widt	h C	Quantity 30 units	
		Tube	N/A		N/A	3			
		i				•			
lectric	al Cł	naracteristics o	of the l	GBT $T_{C} = 25^{\circ}C$ unles	s otherwise noted.				
Symbol		Parameter		Test Condi	tions	Min.	Тур.	Max.	Unit
Off Char	actor	istics							
BV _{CES}		ctor-Emitter Breakdown	Voltage	V _{GE} = 0 V, I _C = 25	50 uA	600			V
AB _{VCES}		erature Coefficient of Br	0						
ΔT_J	Volta	ge		$V_{GE} = 0 V, I_{C} = 1$			0.6		V/∘C
CES		ctor Cut-Off Current		$V_{CE} = V_{CES}, V_{GE} = 0 V$				250	uA
GES	G-E Leakage Current		$V_{GE} = V_{GES}, V_{CE}$	= 0 V			± 100	nA	
On Char	actor	istics							
		Threshold Voltage	-	I _C = 10 mA, V _{CE}	- Vor	5.0	6.0	8.5	V
V _{GE(th)}		ctor to Emitter		$I_{\rm C} = 10$ MA, $V_{\rm CE}$ $I_{\rm C} = 10$ A, $V_{\rm GE}$			2.2	2.8	V
/ _{CE(sat)}		ation Voltage		$I_{\rm C} = 16 \text{ A}, V_{\rm GE}$			2.5		V
		0							
Dynamio	c Cha	racteristics							
Cies	Input	Capacitance			0.1/		660		pF
C _{oes}		ut Capacitance		− V _{CE} = 30 V, V _{GE} = − f = 1 MHz	- U V,		115	-	pF
S _{res}	Reve	rse Transfer Capacitanc	e				25		pF
Ditabin		ava ataviatian							
	. —	aracteristics	_				15		
d(on)	Rise	On Delay Time	_	-	-		15 30		ns
r		Off Delay Time	-	V 200 V I	10.4		36	50	ns ns
d(off)	Fall T	,	-	$V_{CC} = 300 \text{ V}, \text{ I}_{C} = \text{R}_{G} = 20 \Omega, \text{ V}_{GE} =$	10 A, 15 V		158	200	ns
f on		On Switching Loss	-	Inductive Load, T			141		uJ
-on = off		Off Switching Loss					215		uJ
=ts	1	Switching Loss	-	-	_		356	500	uJ
d(on)		On Delay Time					16		ns
r	Rise			-	-	/	33		ns
d(off)	Turn-	Off Delay Time		$V_{CC} = 300 \text{ V}, \text{ I}_{C} = 10 \text{ A},$ $R_{G} = 20\Omega, V_{GE} = 15 \text{ V},$			42	60	ns
f	Fall T	ïme					242	350	ns
on		On Switching Loss		Inductive Load, T	_C = 125°C		161		uJ
off	Turn-	Off Switching Loss		_			452		uJ
ts	Total	Switching Loss					613	860	uJ
Г _{sc}	Short	Circuit Withstand Time		V _{CC} = 300 V, V _{GE} @ T _C = 100°C	= 15 V	10			us
ζ _a	Total	Gate Charge					30	45	nC
<u>∽g</u> Ω _{ge}		Emitter Charge		$V_{CE} = 300 \text{ V}, \text{ I}_{C} = 10 \text{ A},$ - $V_{GE} = 15 \text{ V}$			5	10	nC
ຊ _{gc}		Collector Charge					8	16	nC
-e	Interr	al Emitter Inductance		Measured 5mm fr	om PKG		14	ł	nH
lectric	al Cł	naracteristics o	of DIOD)E $T_{C} = 25^{\circ}C$ unless oth	erwise noted.				
Symbol		Parameter		Test Condit	ions	Min.	Тур.	Max.	Unit
			<u> </u>	10.4	$T_{C} = 25^{\circ}C$		1.4	1.7	
V _{FM}	Diode	Diode Forward Voltage		_F = 12 A	T _C = 100°C		1.3		V
t _{rr}					$T_{\rm C} = 25^{\circ}{\rm C}$		42	60	
	Diode Reverse Recovery Time	ne		$T_{\rm C} = 100^{\circ}{\rm C}$		60		ns	
	Diode Peak Reverse Recovery	rv L	12 Δ	$T_{\rm C} = 25^{\circ}{\rm C}$		3.5	6.0		
rr	-			$I_F = 12 \text{ A},$ di/dt = 200 A/us $T_C = 25^{\circ}C$ $T_C = 100^{\circ}C$			5.6		A
	Jano		^u	_				190	30
λ _{rr} C	D	Diode Reverse Recovery Charge		$T_{\rm C} = 25^{\circ}{\rm C}$ $T_{\rm C} = 100^{\circ}{\rm C}$	-C- 20 C		80	180	nC

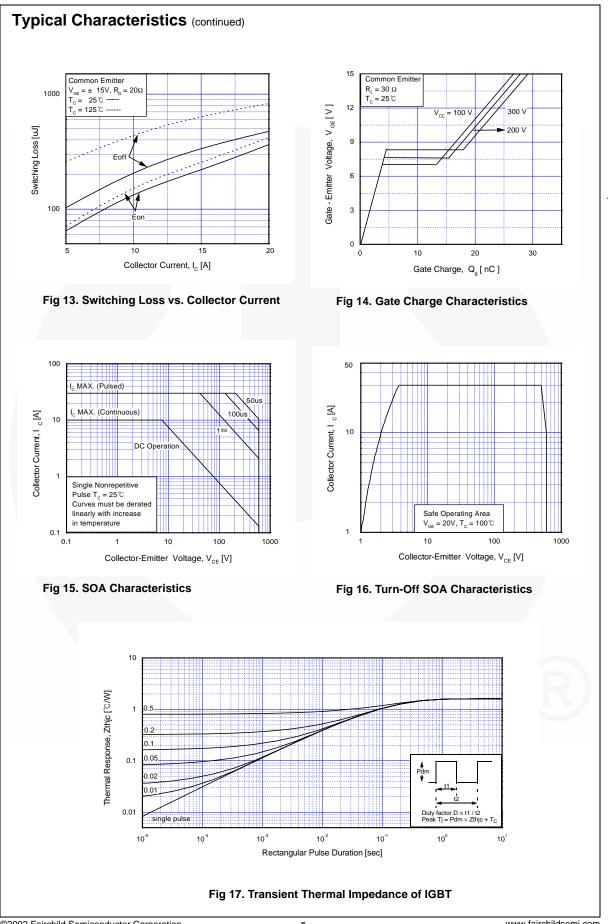


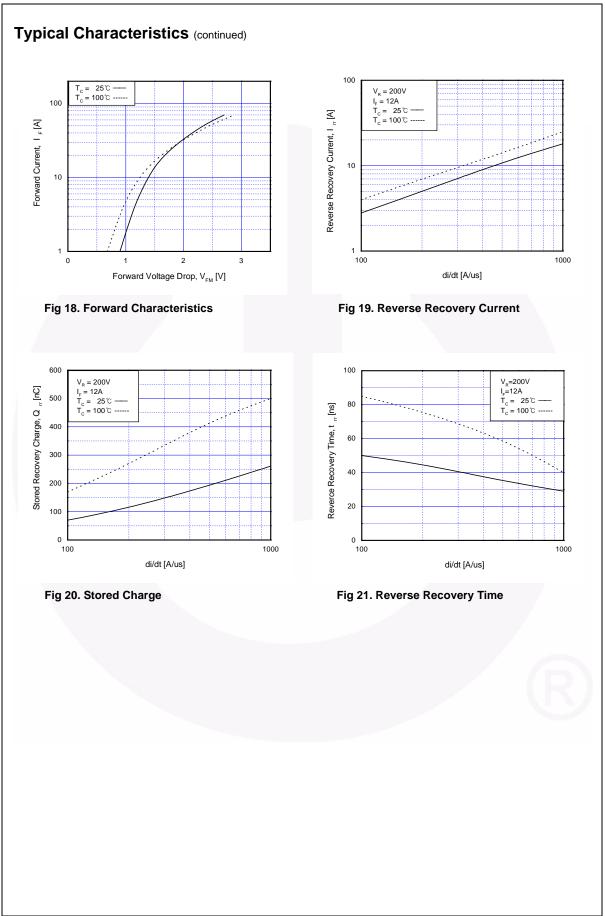
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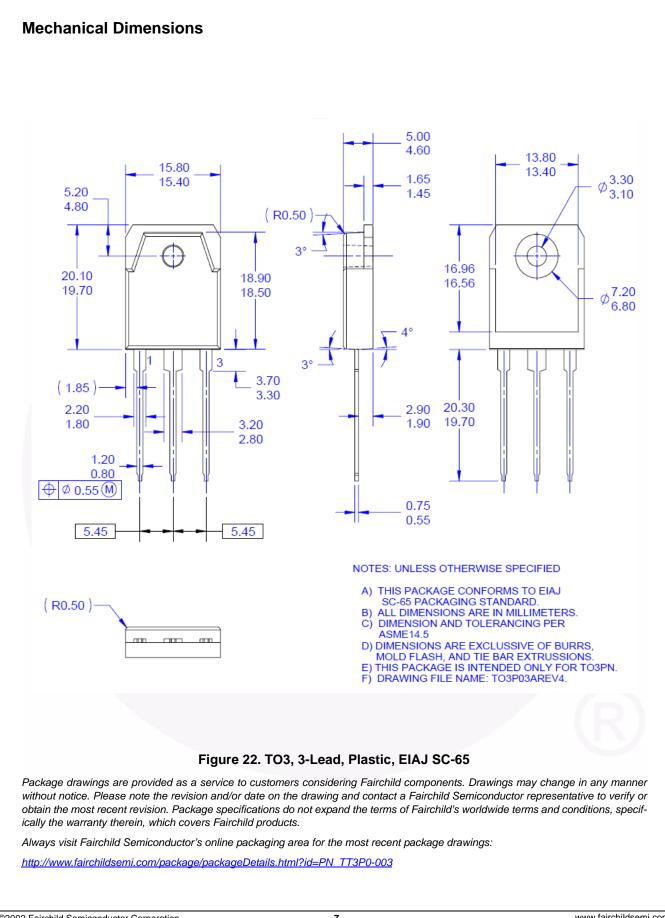
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SGH10N60RUFD — 600 V, 10 A Short Circuit Rated IGBT

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