

## **SGH80N60UFD**

### **Ultrafast IGBT**

#### **General Description**

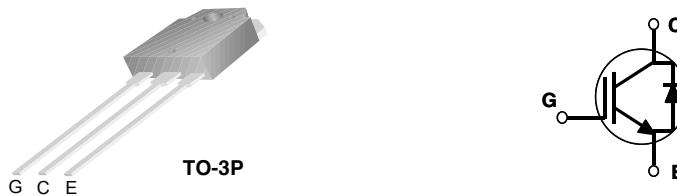
Fairchild's UFD series of Insulated Gate Bipolar Transistors (IGBTs) provides low conduction and switching losses. The UFD series is designed for applications such as motor control and general inverters where high speed switching is a required feature.

#### **Features**

- High speed switching
- Low saturation voltage :  $V_{CE(sat)} = 2.1 \text{ V}$  @  $I_C = 40\text{A}$
- High input impedance
- CO-PAK, IGBT with FRD :  $t_{rr} = 50\text{ns}$  (typ.)

#### **Applications**

AC & DC motor controls, general purpose inverters, robotics, and servo controls.



#### **Absolute Maximum Ratings**

$T_C = 25^\circ\text{C}$  unless otherwise noted

Symbol	Description	SGH80N60UFD	Units
$V_{CES}$	Collector-Emitter Voltage	600	V
$V_{GES}$	Gate-Emitter Voltage	$\pm 20$	V
$I_C$	Collector Current @ $T_C = 25^\circ\text{C}$	80	A
	Collector Current @ $T_C = 100^\circ\text{C}$	40	A
$I_{CM(1)}$	Pulsed Collector Current	220	A
$I_F$	Diode Continuous Forward Current @ $T_C = 100^\circ\text{C}$	25	A
$I_{FM}$	Diode Maximum Forward Current	280	A
$P_D$	Maximum Power Dissipation @ $T_C = 25^\circ\text{C}$	195	W
	Maximum Power Dissipation @ $T_C = 100^\circ\text{C}$	78	W
$T_J$	Operating Junction Temperature	-55 to +150	$^\circ\text{C}$
$T_{stg}$	Storage Temperature Range	-55 to +150	$^\circ\text{C}$
$T_L$	Maximum Lead Temp. for Soldering Purposes,/8" from Case for 5 Seconds	300	$^\circ\text{C}$

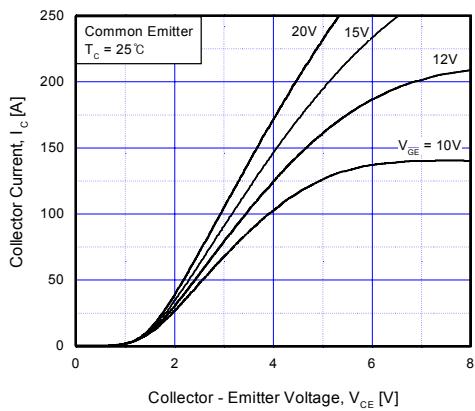
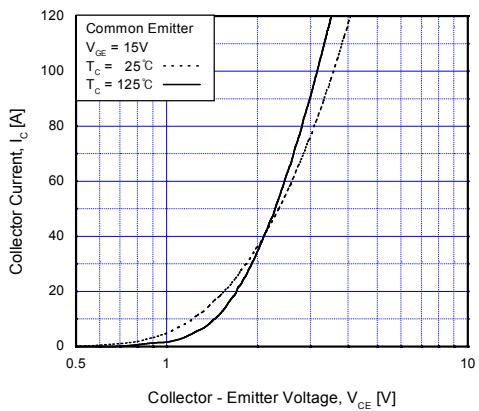
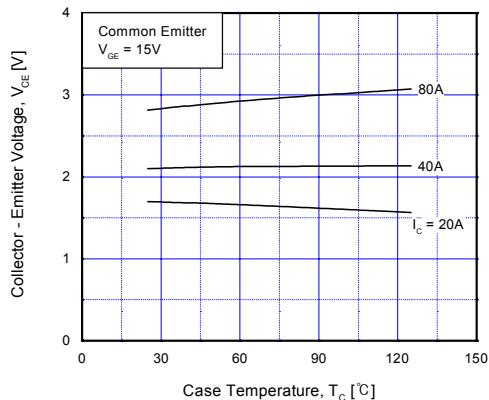
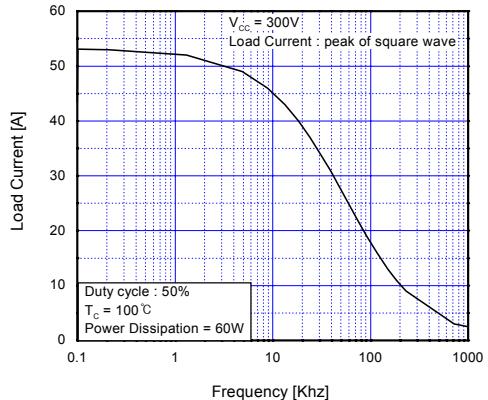
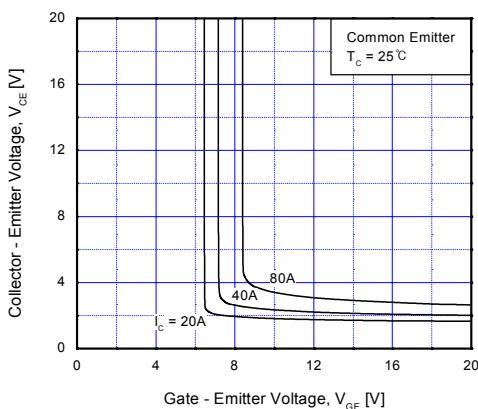
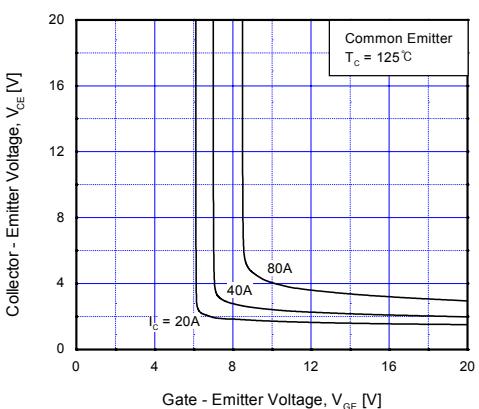
**Notes :**

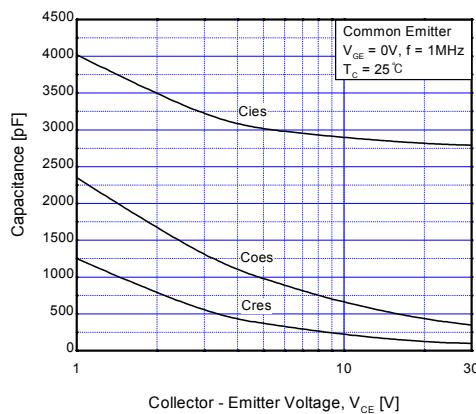
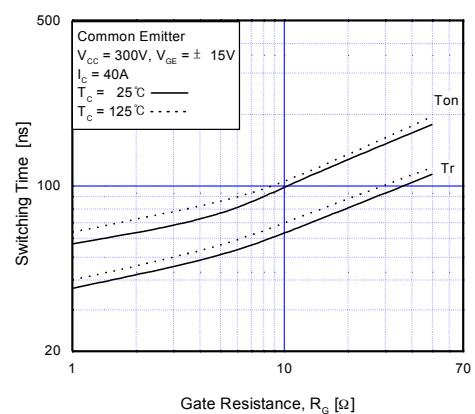
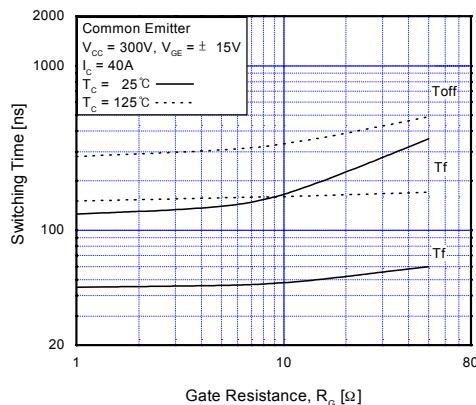
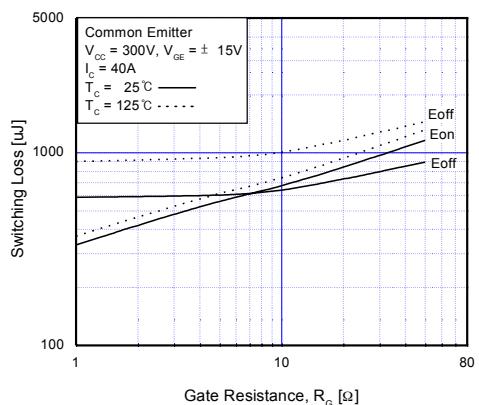
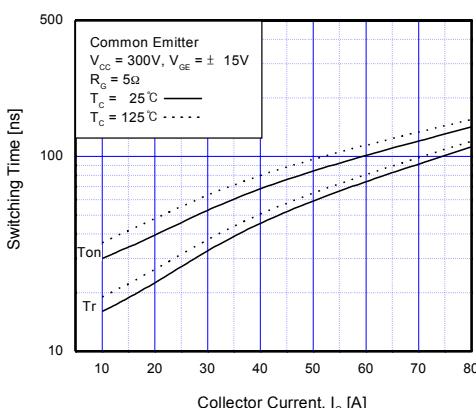
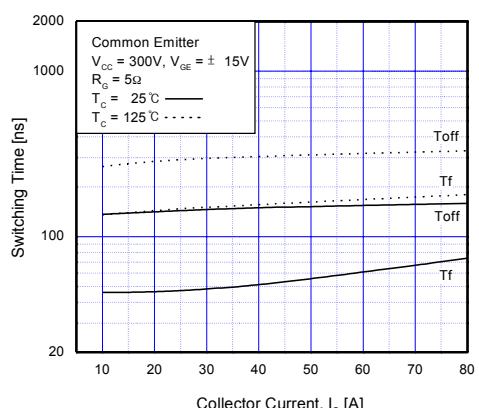
(1) Repetitive rating : Pulse width limited by max. junction temperature

#### **Thermal Characteristics**

Symbol	Parameter	Typ.	Max.	Units
$R_{0JC}(\text{IGBT})$	Thermal Resistance, Junction-to-Case	--	0.64	$^\circ\text{C}/\text{W}$
$R_{0JC}(\text{DIODE})$	Thermal Resistance, Junction-to-Case	--	0.83	$^\circ\text{C}/\text{W}$
$R_{0JA}$	Thermal Resistance, Junction-to-Ambient	--	40	$^\circ\text{C}/\text{W}$



**Fig 1. Typical Output Characteristics****Fig 2. Typical Saturation Voltage Characteristics****Fig 3. Saturation Voltage vs. Case Temperature at Variant Current Level****Fig 4. Load Current vs. Frequency****Fig 5. Saturation Voltage vs.  $V_{GE}$** **Fig 6. Saturation Voltage vs.  $V_{GE}$**

**Fig 7. Capacitance Characteristics****Fig 8. Turn-On Characteristics vs. Gate Resistance****Fig 9. Turn-Off Characteristics vs. Gate Resistance****Fig 10. Switching Loss vs. Gate Resistance****Fig 11. Turn-On Characteristics vs. Collector Current****Fig 12. Turn-Off Characteristics vs. Collector Current**

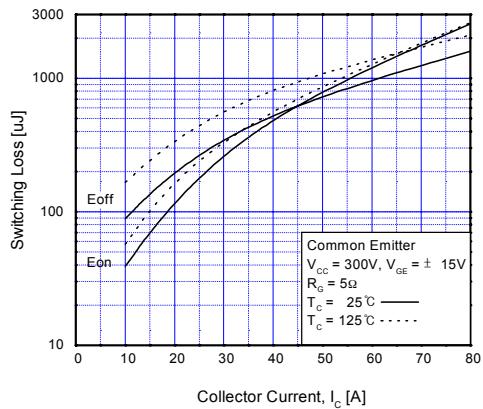


Fig 13. Switching Loss vs. Collector Current

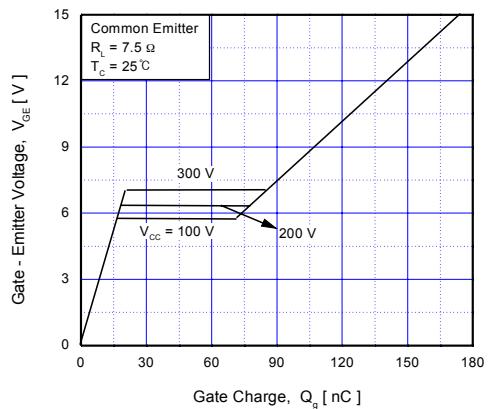


Fig 14. Gate Charge Characteristics

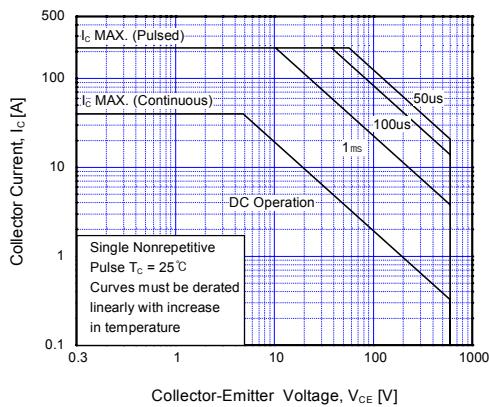


Fig 15. SOA Characteristics

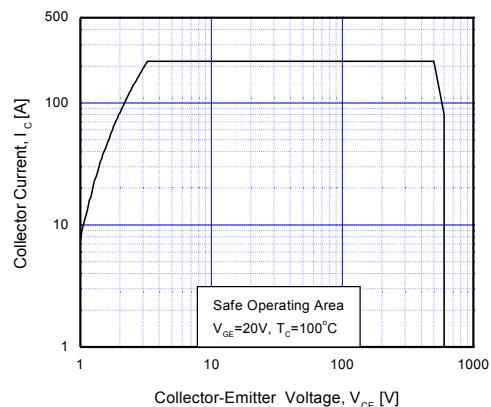


Fig 16. Turn-Off SOA Characteristics

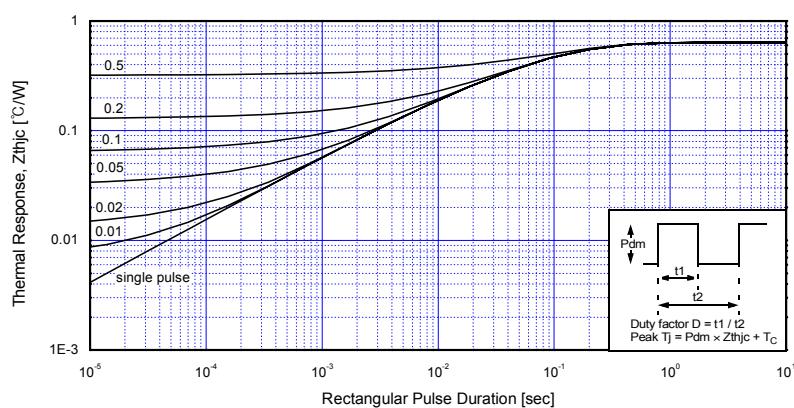
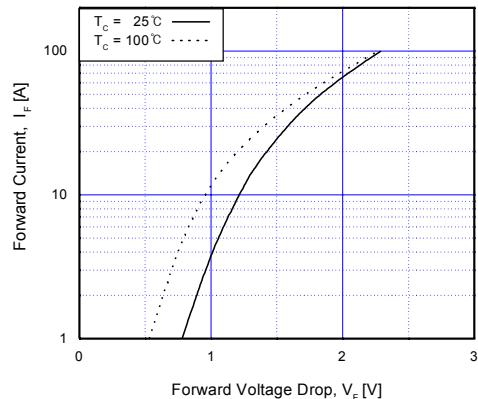
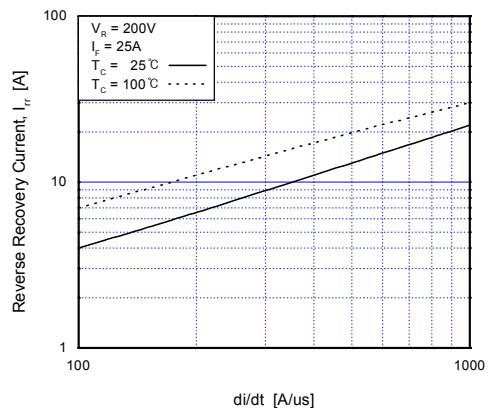
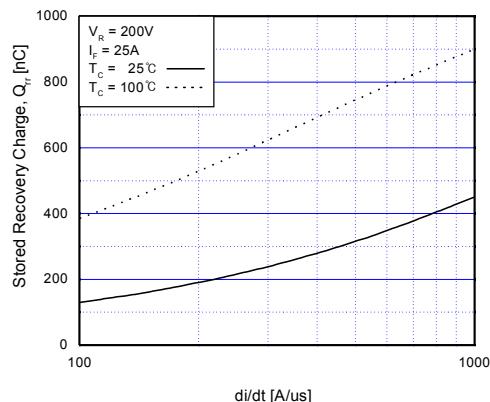
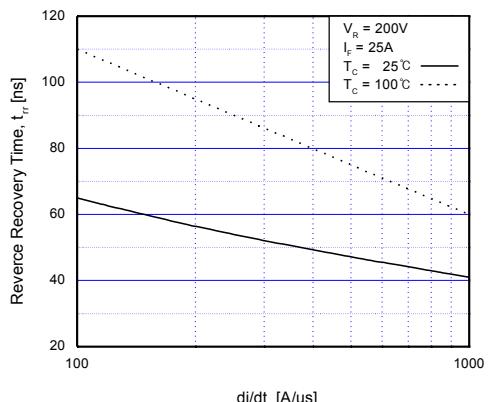


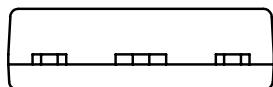
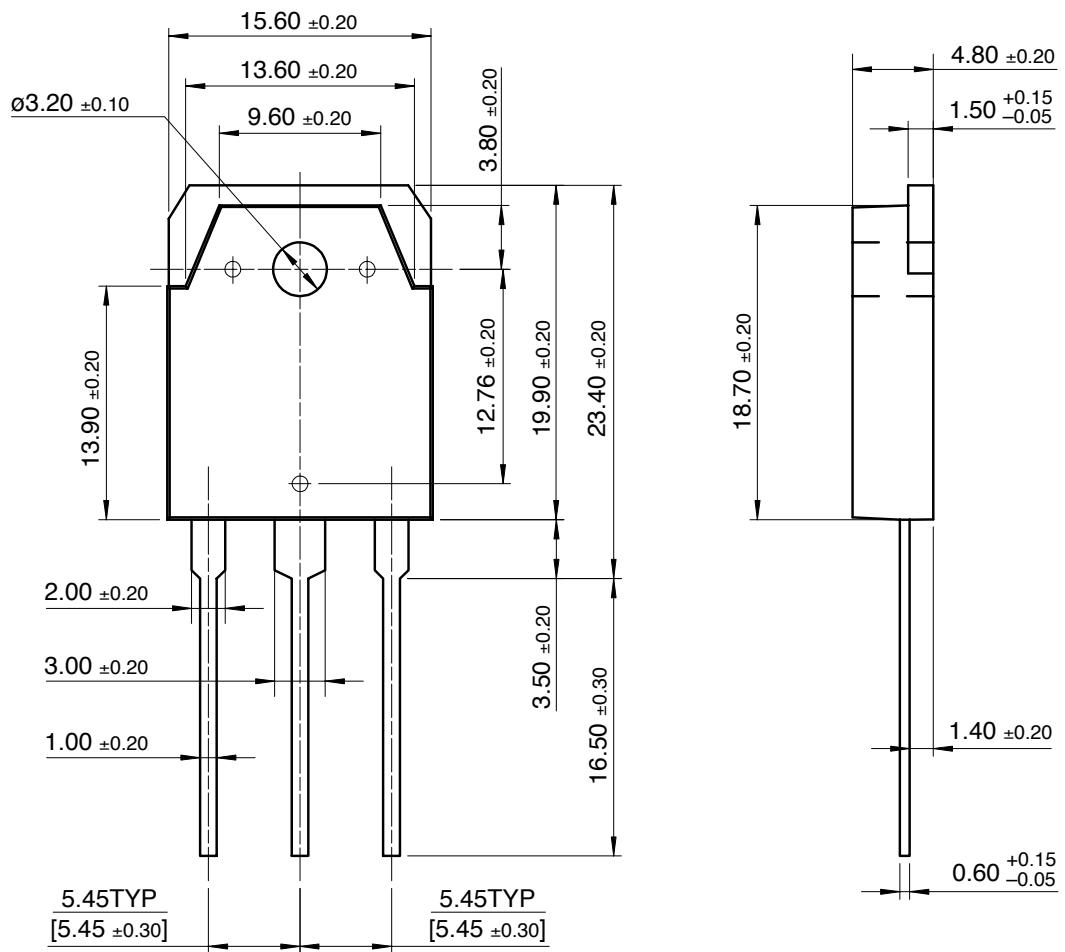
Fig 17. Transient Thermal Impedance of IGBT

**Fig 18. Forward Characteristics****Fig 19. Reverse Recovery Current****Fig 20. Stored Charge****Fig 21. Reverse Recovery Time**

SGH80N60UFD

**Package Dimension**

**TO-3P**



Dimensions in Millimeters

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CoolFET™	FASTR™	MicroFET™	PowerTrench®	SuperSOT™-6
CROSSVOLT™	FRFET™	MicroPak™	QFET™	SuperSOT™-8
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