



# FGA25N120ANTD/FGA25N120ANTD\_F109

## 1200V NPT Trench IGBT

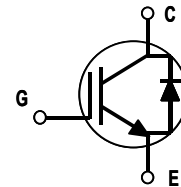
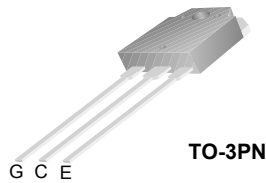
### Features

- NPT Trench Technology, Positive temperature coefficient
- Low saturation voltage:  $V_{CE(sat), typ} = 2.0V$   
@  $I_C = 25A$  and  $T_C = 25^\circ C$
- Low switching loss:  $E_{off, typ} = 0.96mJ$   
@  $I_C = 25A$  and  $T_C = 25^\circ C$
- Extremely enhanced avalanche capability

### Description

Using Fairchild's proprietary trench design and advanced NPT technology, the 1200V NPT IGBT offers superior conduction and switching performances, high avalanche ruggedness and easy parallel operation.

This device is well suited for the resonant or soft switching application such as induction heating, microwave oven, etc.



### Absolute Maximum Ratings

Symbol	Description	FGA25N120ANTD	Units
$V_{CES}$	Collector-Emitter Voltage	1200	V
$V_{GES}$	Gate-Emitter Voltage	$\pm 20$	V
$I_C$	Collector Current	@ $T_C = 25^\circ C$	50
	Collector Current	@ $T_C = 100^\circ C$	25
$I_{CM}$	Pulsed Collector Current (Note 1)	90	A
$I_F$	Diode Continuous Forward Current	@ $T_C = 100^\circ C$	25
$I_{FM}$	Diode Maximum Forward Current	150	A
$P_D$	Maximum Power Dissipation	@ $T_C = 25^\circ C$	312
	Maximum Power Dissipation	@ $T_C = 100^\circ C$	125
$T_J$	Operating Junction Temperature	-55 to +150	$^\circ C$
$T_{stg}$	Storage Temperature Range	-55 to +150	$^\circ C$
$T_L$	Maximum Lead Temp. for soldering Purposes, 1/8" from case for 5 seconds	300	$^\circ C$

### Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case for IGBT	--	0.4	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case for Diode	--	2.0	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	--	40	$^\circ C/W$

### Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FGA25N120ANTD	FGA25N120ANTD	TO-3P	--	--	30

### Electrical Characteristics of the IGBT T<sub>C</sub> = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
<b>Off Characteristics</b>						
I <sub>CES</sub>	Collector Cut-Off Current	V <sub>CE</sub> = V <sub>CES</sub> , V <sub>GE</sub> = 0V	--	--	3	mA
I <sub>GES</sub>	G-E Leakage Current	V				

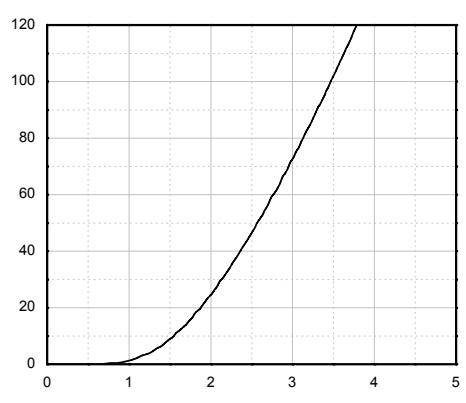
**Electrical Characteristics of DIODE**  $T_C = 25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units	
$V_{FM}$	Diode Forward Voltage	$I_F = 25\text{A}$	$T_C = 25^\circ\text{C}$	--	2.0	3.0	V
			$T_C = 125^\circ\text{C}$	--	2.1	--	
$t_{rr}$	Diode Reverse Recovery Time	$I_F = 25\text{A}$ $di/dt = 200\text{ A}/\mu\text{s}$	$T_C = 25^\circ\text{C}$	--	235	350	ns
			$T_C = 125^\circ\text{C}$	--	300	--	
$I_{rr}$	Diode Peak Reverse Recovery Current		$T_C = 25^\circ\text{C}$	--	27	40	A
			$T_C = 125^\circ\text{C}$	--	31	--	
$Q_{rr}$	Diode Reverse Recovery Charge		$T_C = 25^\circ\text{C}$	--	3130	4700	nC
			$T_C = 125^\circ\text{C}$	--	4650	--	

### Typical Performance Characteristics

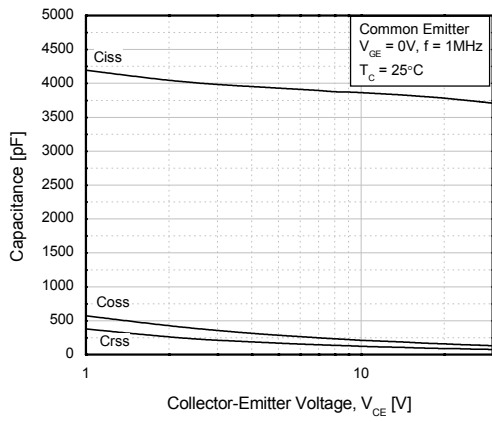
Figure 1. Typical Output Characteristics

Figure 2. Typical Saturation Voltage

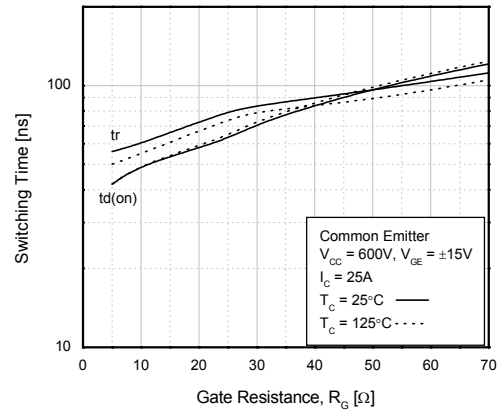


**Typical Performance Characteristics** (Continued)

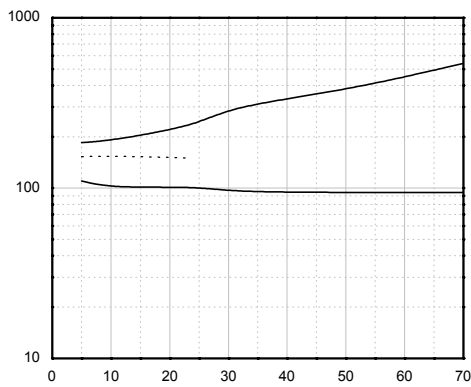
**Figure 7. Capacitance Characteristics**



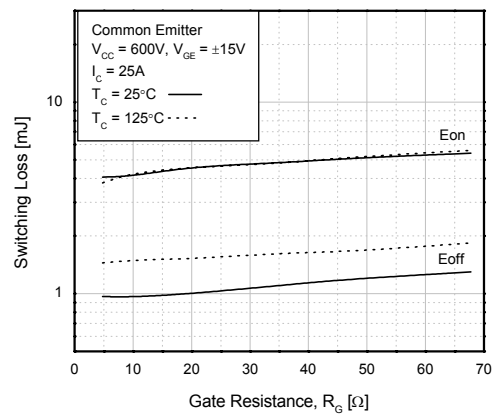
**Figure 8. Turn-On Characteristics vs. Gate Resistance**



**Figure 9. Turn-Off Characteristics vs. Gate Resistance**

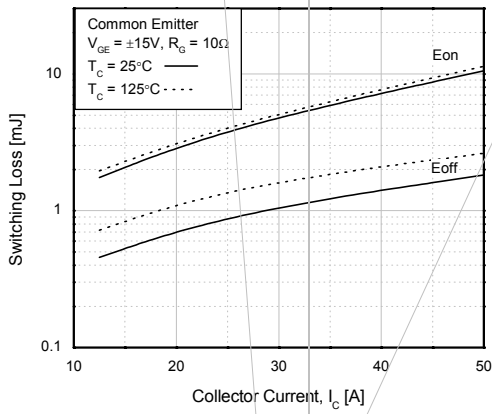


**Figure 10. Switching Loss vs. Gate Resistance**

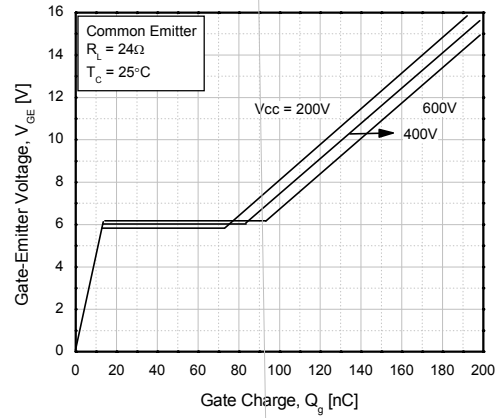


**Typical Performance Characteristics (Continued)**

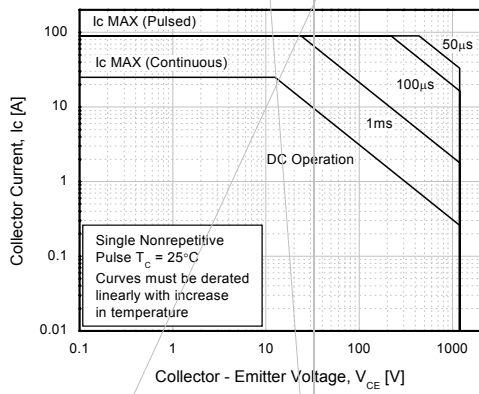
**Figure 13. Switching Loss vs. Collector Current**



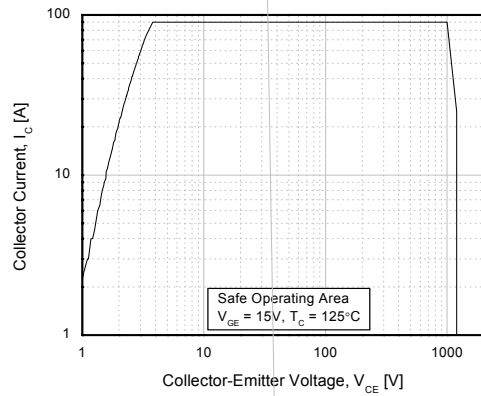
**Figure 14. Gate Charge Characteristics**



**Figure 15. SOA Characteristics**



**Figure 16. Turn-Off SOA**



**Figure 17. Transient Thermal Impedance of IGBT**

### Typical Performance Characteristics (Continued)

Figure 18. Forward Characteristics

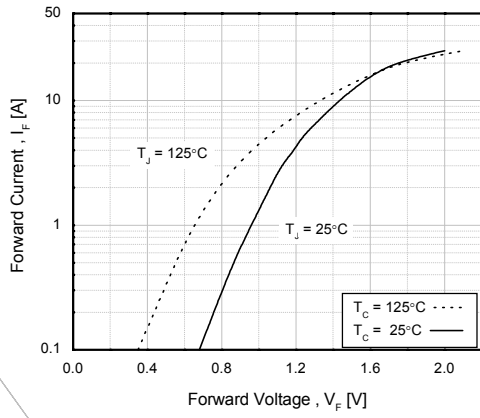
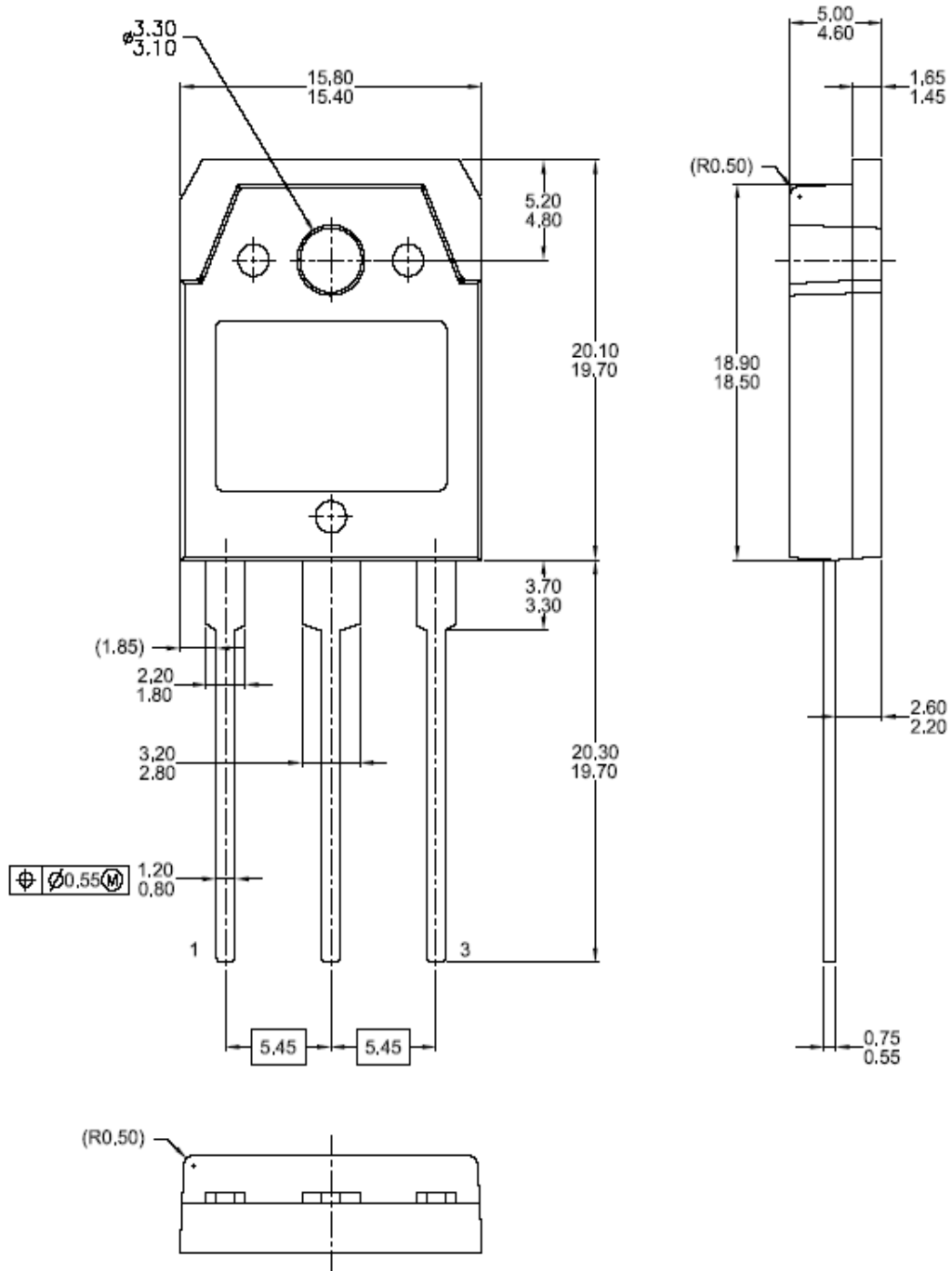


Figure 19. Reverse Recovery Current

Mechanical Dimensions (continued)

TO-3PN



Dimensions in Millimeters



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FAST <sub>r</sub> ™	MicroPak™	QT Optoelectronics™	TinyPWM™	
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