

August 2010

FGPF4633 330V PDP IGBT

Features

- · High current capability
- Low saturation voltage: $V_{CE(sat)} = 1.55 \text{ V} \otimes I_C = 70 \text{A}$
- · High input impedance
- · Fast switching
- · RoHS compliant

Applications

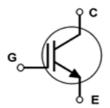
· PDP System



General Description

Using Novel Trench IGBT Technology, Fairchild's new series of trench IGBTs offer the optimum performance for PDP applications where low conduction and switching losses are essential.





Absolute Maximum Ratings

Symbol	Description		Ratings	Units	
V _{CES}	Collector to Emitter Voltage		330	V	
V _{GES}	Gate to Emitter Voltage		± 30	V	
I _{C pulse(1)*}	Collector Current	@ T _C = 25°C	300	Α	
P _D	Maximum Power Dissipation	@ T _C = 25°C	30.5	W	
· D	Maximum Power Dissipation	$@T_C = 100^{\circ}C$	12.2	W	
T_J	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	

Thermal Characteristics

Symbol	Parameter	Тур.	Max.	Units	
$R_{\theta JC}(IGBT)$	Thermal Resistance, Junction to Case	-	4.1	°C/W	
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	Ambient - 62.5 °C/W		°C/W	

Notes

(1) Half Sine Wave, D < 0.01, pluse width < 5μ sec

^{*} Ic_pluse limited by max Tj

Package Marking and Ordering Information

Device Marking	Device	Package	Packaging Type	Qty per Tube	Max Qty per Box
FGPF4633	FGPF4633TU	TO-220F	Tube	50ea	-

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

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Units
Off Charac	teristics					
BV _{CES}	Collector to Emitter Breakdown Voltage	$V_{GE} = 0V, I_{C} = 250\mu A$	330	-	-	V
$\frac{\Delta BV_{CES}}{\Delta T_J}$	Temperature Coefficient of Breakdown Voltage	V _{GE} = 0V, I _C = 250μA	-	0.3	-	V/°C
I _{CES}	Collector Cut-Off Current	$V_{CE} = V_{CES}, V_{GE} = 0V$	-	-	100	μА
I _{GES}	G-E Leakage Current	$V_{GE} = V_{GES}, V_{CE} = 0V$	-	-	±400	nA
On Charac	teristics					
V _{GE(th)}	G-E Threshold Voltage	$I_{C} = 250 \mu A, V_{CE} = V_{GE}$	2.4	3.3	4.0	V
· · · · ·		I _C = 20A, V _{GE} = 15V	-	1.1	-	V
V	Collector to Emitter	I _C = 40A, V _{GE} = 15V	-	1.35	-	
OL(OUL)	Collector to Emitter Saturation Voltage	I _C = 70A, V _{GE} = 15V, T _C = 25°C	-	1.55	1.8	V
		I _C = 70A, V _{GE} = 15V, T _C = 125°C	-	1.61	-	V
Dynamic C	haracteristics		-	1		
C _{ies}	Input Capacitance	V _{CE} = 30V, V _{GE} = 0V, f = 1MHz	-	1715	-	pF
C _{oes}	Output Capacitance		-	75	-	pF
C _{res}	Reverse Transfer Capacitance	T = TMHZ	-	55	-	pF
Switching	Characteristics					
t _{d(on)}	Turn-On Delay Time		-	8	_	ns
t _r	Rise Time	V_{CC} = 200V, I_{C} = 20A R_{G} = 5 Ω , V_{GE} = 15V Resistive Load, T_{C} = 25°C	-	30	-	ns
t _{d(off)}	Turn-Off Delay Time		-	52	-	ns
t _f	Fall Time		-	260	-	ns
t _{d(on)}	Turn-On Delay Time		-	8	-	ns
t _r	Rise Time	V_{CC} = 200V, I_{C} = 20A, R_{G} = 5 Ω , V_{GE} = 15V, Resistive Load, T_{C} = 125°C	-	32	-	ns
t _{d(off)}	Turn-Off Delay Time		-	53	-	ns
t _f	Fall Time		-	341	-	ns
Qg	Total Gate Charge	V = 200V I = 20A	-	60	-	nC
Q _{ge}	Gate to Emitter Charge	$V_{CE} = 200V, I_{C} = 20A$ $V_{GE} = 15V$	-	8	-	nC
Q _{gc}	Gate to Collector Charge		-	20	-	nC

Figure 1. Typical Output Characteristics

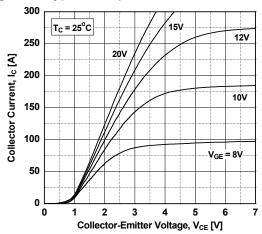


Figure 3. Typical Saturation Voltage Characteristics

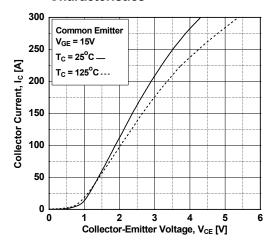


Figure 5. Saturation Voltage vs. Case
Temperature at Variant Current Level

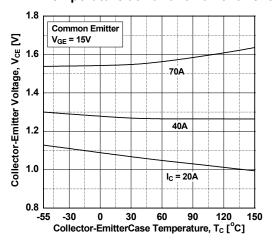


Figure 2. Typical Output Characteristics

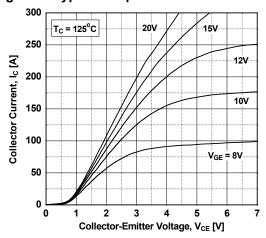


Figure 4. Transfer Characteristics

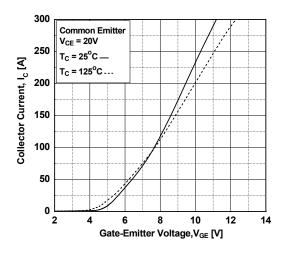


Figure 6. Saturation Voltage vs. V_{GE}

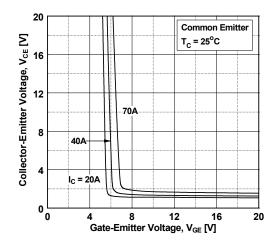


Figure 7. Saturation Voltage vs. V_{GE}

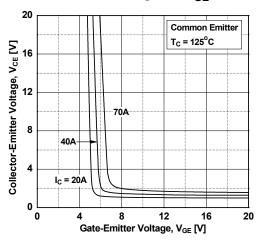


Figure 9. Gate charge Characteristics

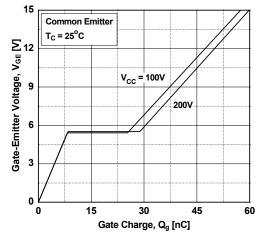


Figure 11. Turn-on Characteristics vs.
Gate Resistance

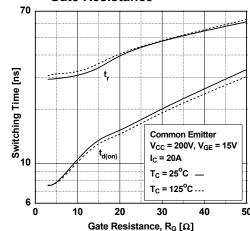


Figure 8. Capacitance Characteristics

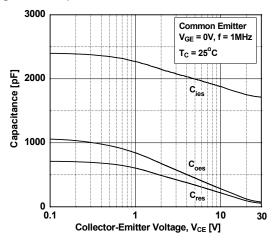


Figure 10. SOA Characteristics

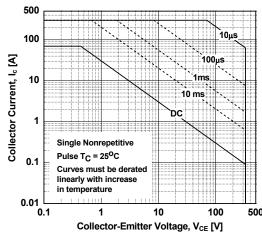


Figure 12. Turn-off Characteristics vs. Gate Resistance

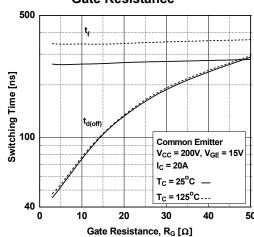


Figure 13. Turn-on Characteristics vs. Collector Current

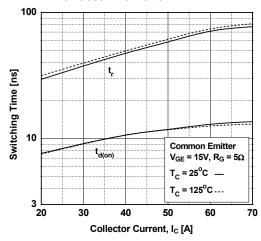


Figure 14. Turn-off Characteristics vs.
Collector Current

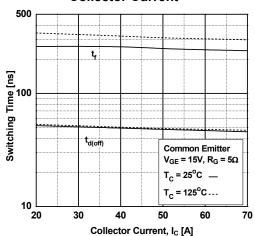


Figure 15. Switching Loss vs. Gate Resistance

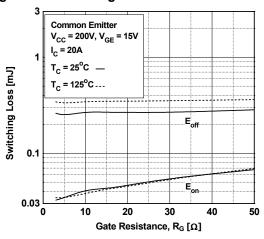


Figure 16. Switching Loss vs. Collector Current

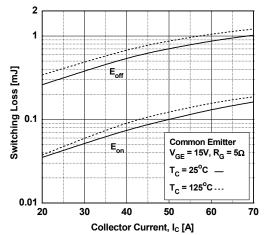
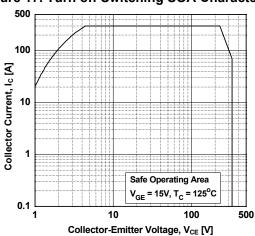
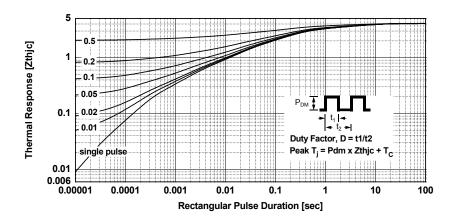


Figure 17. Turn off Switching SOA Characteristics



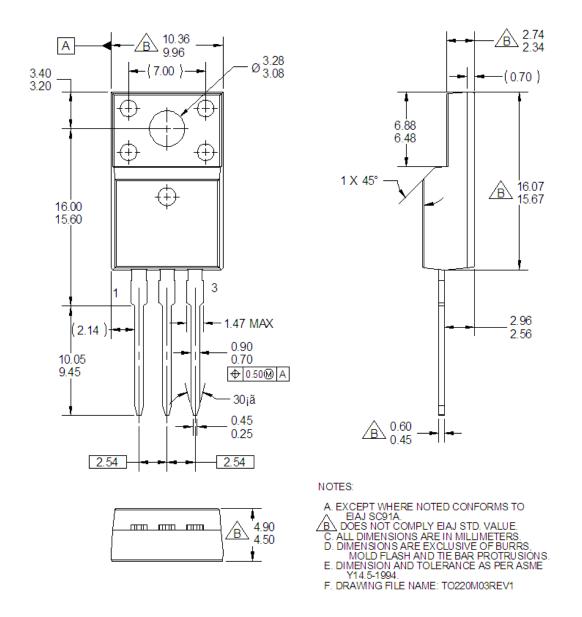
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Package Dimensions

TO-220F (Retractable)



* Front/Back Side Isolation Voltage : AC 2700V

Dimensions in Millimeters





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