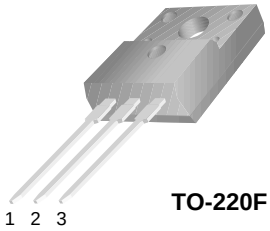
FAIRCHILD
SEMICONDUCTOR®

FKPF12N60 / FKPF12N80

Application Explanation

- Switching mode power supply, light dimmer, electric flasher unit, hair drier
- TV sets, stereo, refrigerator, washing machine
- Electric blanket, solenoid driver, small motor control
- Photo copier, electric tool



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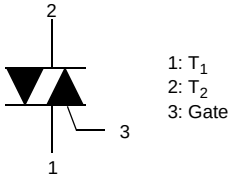


Bi-Directional Triode Thyristor Planar Silicon

Absolute Maximum Ratings T_C=25°C unless otherwise noted

Symbol	Parameter	Rating		Units
		FKPF12N60	FKPF12N80	
V_{DRM}	Repetitive Peak Off-State Voltage (Note1)	600	800	V

Symbol	Parameter	Conditions	Rating	Units
$I_{T\ (RMS)}$	RMS On-State Current	Commercial frequency, sine full wave 360° conduction, T_C=82°C	12	A
I_{TSM}	Surge On-State Current	60Hz sinewave 1 full cycle, peak value, non-repetitive	120	A
I^2t	I^2t for Fusing	Value corresponding to 1 cycle of halfwave 60Hz, surge on-state current	60	A^2s
di/dt	Critical Rate of Rise of On-State Current	I_G = 2x I_{GT}, tr ≤ 100ns	50	A/µs
P_{GM}	Peak Gate Power Dissipation	T_C = +80°C, Pulse Width = 1.0µs	5	W
$P_{G\ (AV)}$	Average Gate Power Dissipation	T_C = +80°C, t = 8.3ms	0.5	W
V_{GM}	Peak Gate Voltage		10	V
I_{GM}	Peak Gate Current	Pulse Width ≤ 1.0µsec; T_C = 90°C	2	A
T_J	Junction Temperature		- 40 ~ 125	°C
T_{STG}	Storage Temperature		- 40 ~ 125	°C
V_{iso}	Isolation Voltage	Ta=25°C, AC 1 minute, T_1 T_2 G terminal to case	1500	V

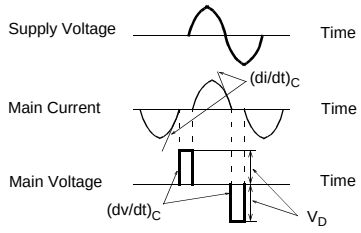
Thermal Characteristic

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$R_{th(J-C)}$	Thermal Resistance	Junction to case (Note 4)	-	-	3.0	°C/W

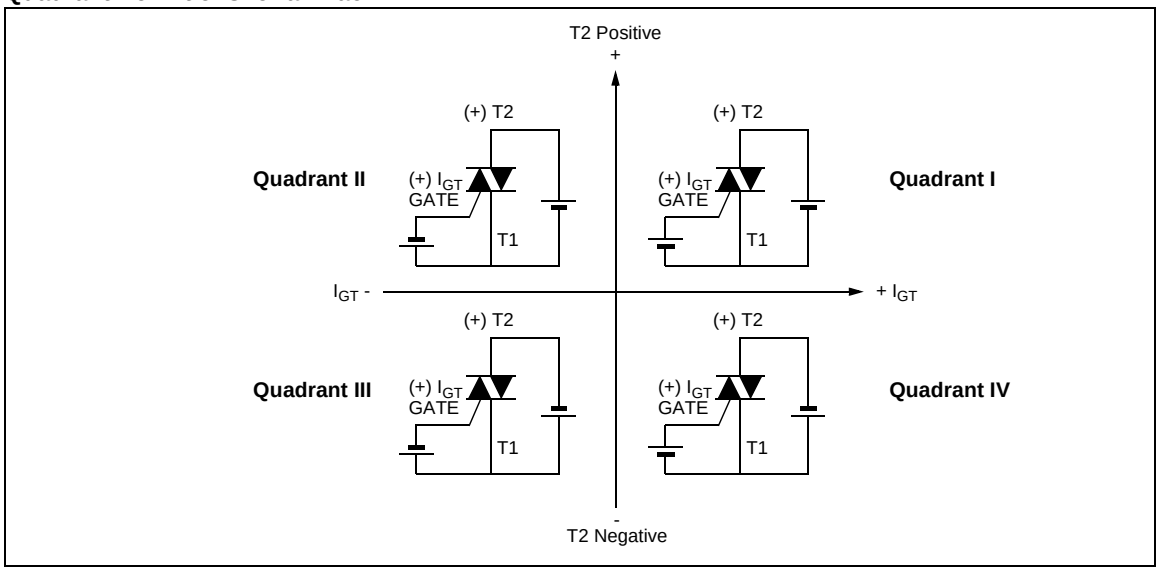
Electrical Characteristics T_C=25°C unless otherwise noted

Symbol	Parameter		Test Condition		Min.	Typ.	Max.	Units
I_{DRM}	Repetieive Peak Off-State Current		V_{DRM} applied		-	-	20	μA
V_{TM}	On-State Voltage		T_C=25°C, I_{TM}=17A Instantaneous measurement		-	-	1.5	V
V_{GT}	Gate Trigger Voltage (Note 2)	I	V_D=6V, R_L=6Ω, R_G=330Ω	T2(+), Gate (+)	-	-	1.5	V
		II		T2(+), Gate (-)	-	-	1.5	V
		III		T2(-), Gate (-)	-	-	1.5	V
I_{GT}	Gate Trigger Current (Note 2)	I	V_D=6V, R_L=6Ω, R_G=330Ω	T2(+), Gate (+)	-	-	30	mA
		II		T2(+), Gate (-)	-	-	30	mA
		III		T2(-), Gate (-)	-	-	30	mA
V_{GD}	Gate Non-Trigger Voltage		T_J=125°C, V_D=1/2V_{DRM}		0.2	-	-	V
I_H	Holding Current		V_D = 12V, I_{TM} = 1A				50	mA
I_L	Latching Current	I, III	V_D = 12V, I_G = 1.2I_{GT}				50	mA
		II					70	mA
dv/dt	Critical Rate of Rise of Off-State Voltag		V_{DRM} = Rated, T_j = 125°C, Exponential Rise			300		V/μs
$(dv/dt)_C$	Critical-Rate of Rise of Off-State Commutating Voltage (Note 3)				10	-	-	V/μs

Notes:
1. Gate Open
2. Measurement using the gate trigger characteristics measurement circuit
3. The critical-rate of rise of the off-state commutating voltage is shown in the table below
4. The contact thermal resistance $R_{TH(c-f)}$ in case of greasing is 0.5 °C/W

V_{DRM} (V)	Test Condition	Commutating voltage and current waveforms (inductive load)
FKPF12N60	1. Junction Temperature T_J=125°C 2. Rate of decay of on-state commutating current $(di/dt)_C$ = - 6.0A/ms 3. Peak off-state voltage V_D = 400V	
FKPF12N80		

Quadrant Definitions for a Triac



Typical Curves

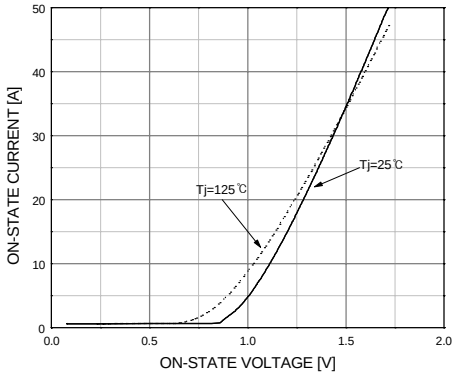


Figure 1. Maximum On-state Characteristics

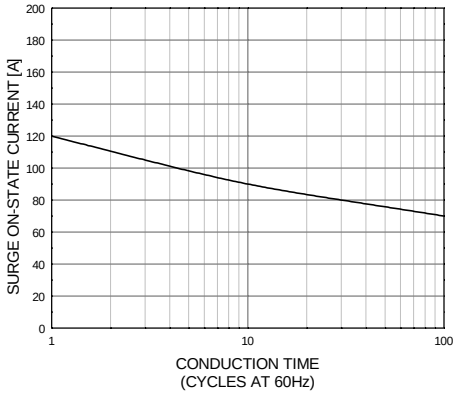


Figure 2. Rated Surge On-state Current

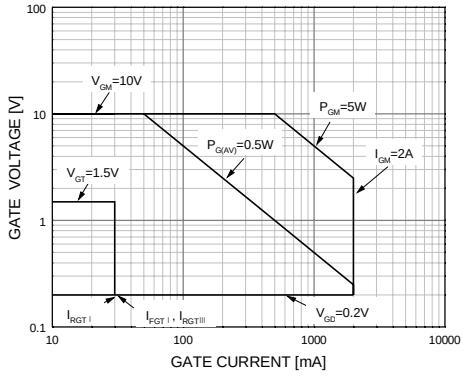


Figure 3. Gate Characteristics

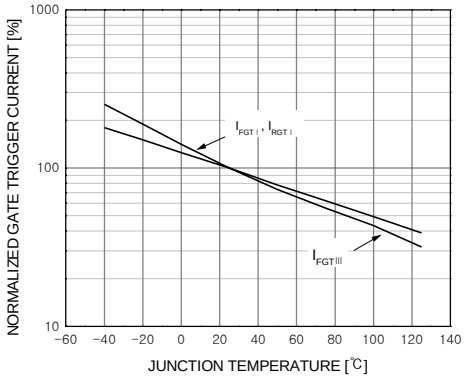


Figure 4. Gate Trigger Current vs Tj

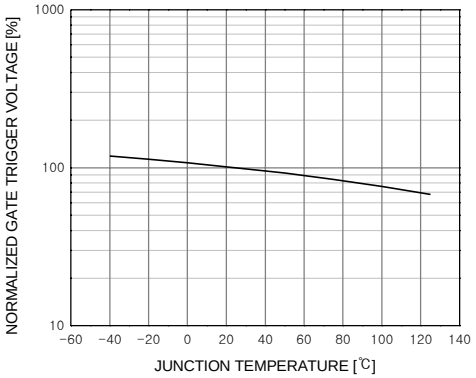


Figure 5. Gate Trigger Voltage vs Tj

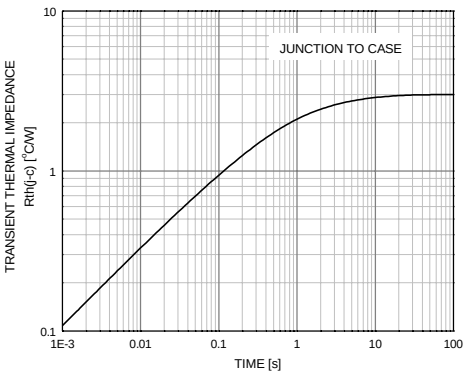


Figure 6. Transient Thermal Impedance

Typical Curves (Continues)

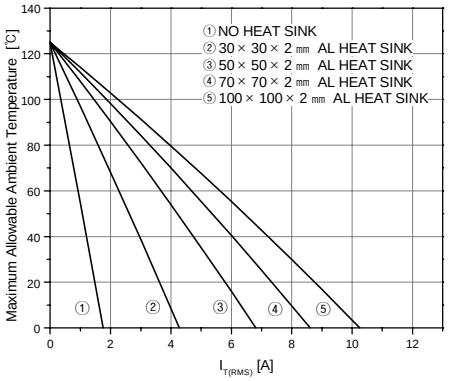


Figure 7. Allowable Ambient Temperature vs Rms On-state Current

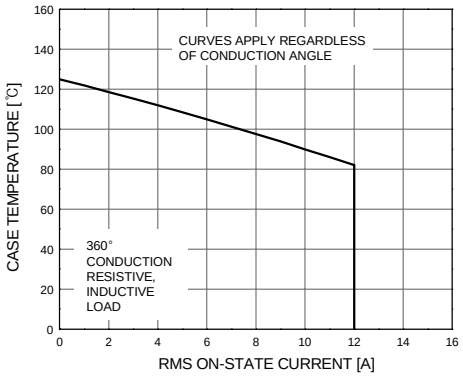


Figure 8. Allowable Case Temperature vs Rms On-state Current

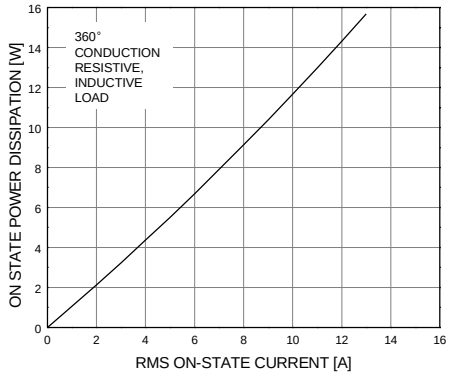


Figure 9. Maximum On-state Power Dissipation

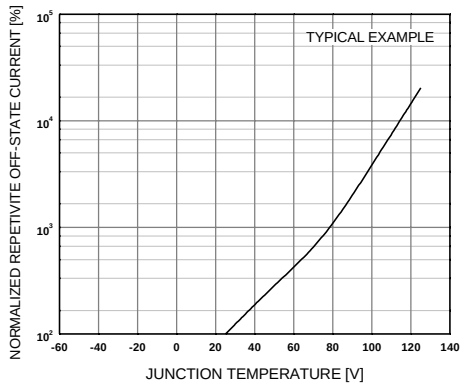


Figure 10. Repetitive Peak Off-state Current vs Junction Temperature

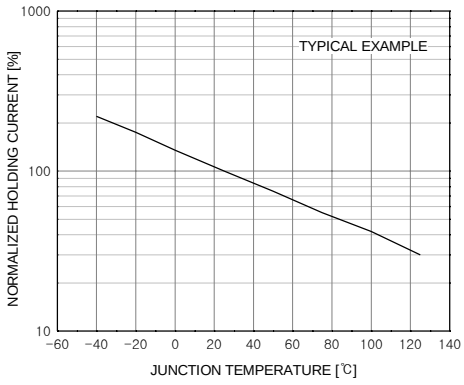


Figure 11. Holding Current vs Junction Temperature

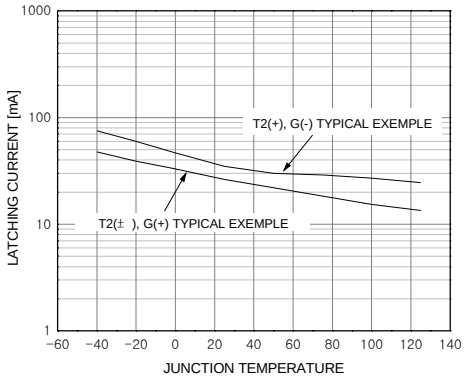


Figure 12. Laching Current vs Junction Temperature

Typical Curves (Continues)

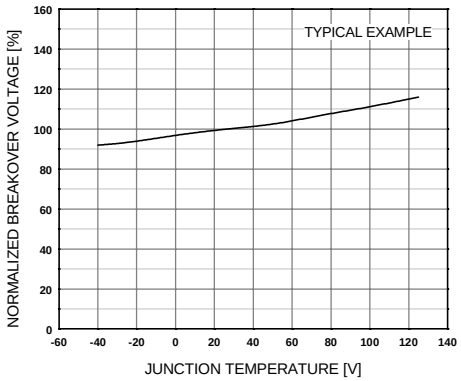


Figure 13. Breakover Voltage vs. Junction Temperature

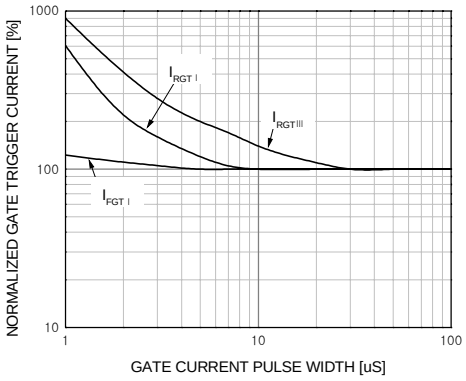


Figure 14. Gate Trigger Current vs. Gate Current Pulse Width

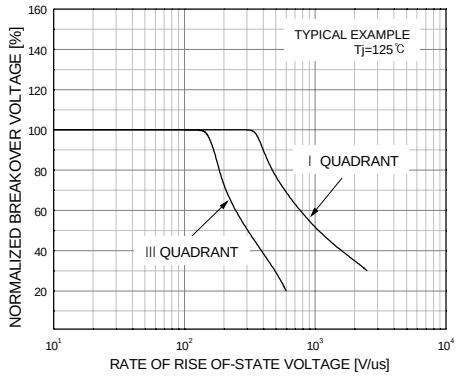


Figure 15. Breakover Voltage vs. Rate of Rise of Off-State Voltage

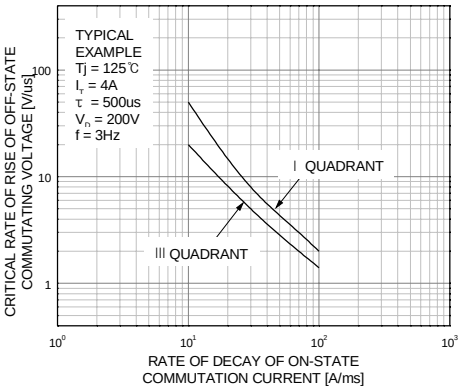


Figure 16. Commutation Characteristics

Package Dimension

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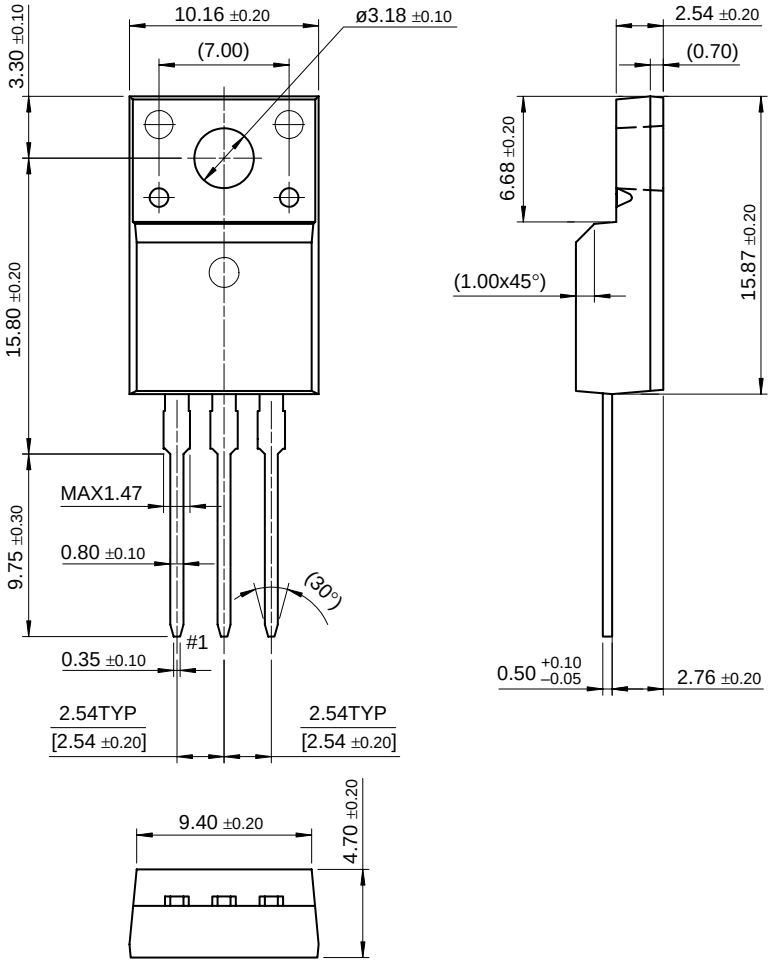

Dimensions in Millimeters

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