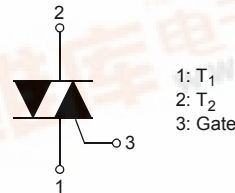
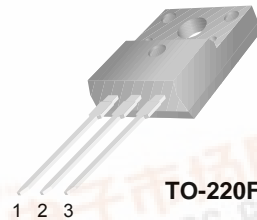




FKPF12N80

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



Bi-Directional Triode Thyristor Planar Silicon

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

Symbol	Parameter	Rating	Units
V_{DRM}	Repetitive Peak Off-State Voltage (Note 1)	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	Sinewave 1 full cycle, peak value, non-repetitive	50Hz	120	A
			60Hz	132	A
I ² t	I ² t for Fusing	Value corresponding to 1 cycle of halfwave, surge on-state current, tp=10ms		72	A ² s
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			5	W
P _{G (AV)}	Average Gate Power Dissipation			0.5	W
V _{GM}	Peak Gate Voltage			10	V
I _{GM}	Peak Gate Current			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
$R_{\text{th(J-C)}}$	Thermal Resistance	Junction to case (Note 4)	-	-	3.0	$^{\circ}\text{C}/\text{W}$

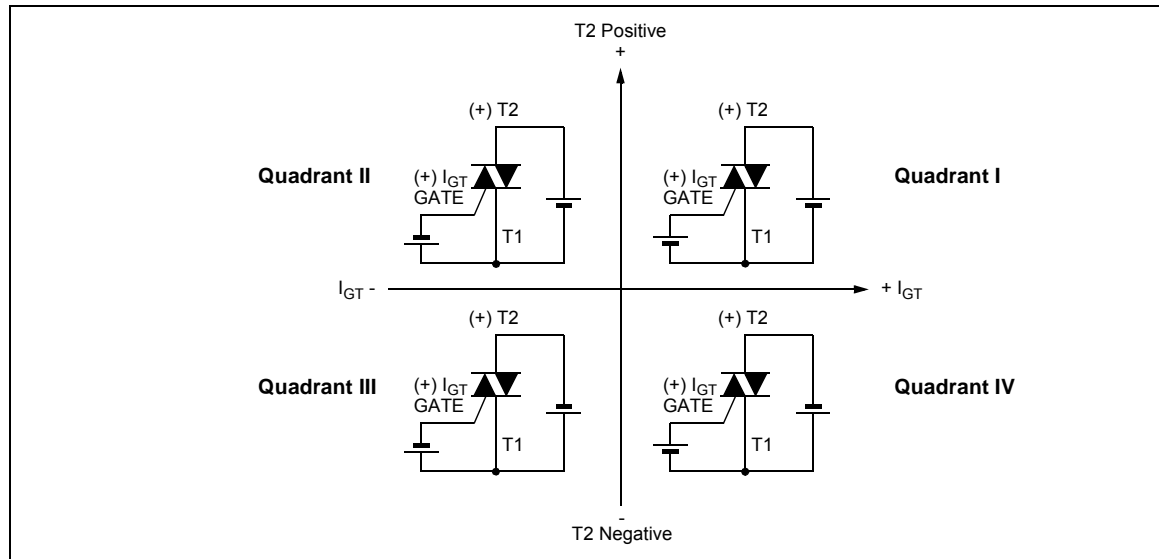
Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise noted

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 =12V, R _L =20Ω	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 =12V, R _L =20Ω	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:

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

V_{DRM} (V)	Test Condition	Commutating voltage and current waveforms (inductive load)
FKPF12N80	1. Junction Temperature $T_J=125^\circ\text{C}$ 2. Rate of decay of on-state commutating current $(di/dt)_\text{C} = -6.5\text{A/ms}$ 3. Peak off-state voltage $V_{\text{D}} = 400\text{V}$	

Quadrant Definitions for a Triac

Typical Curves

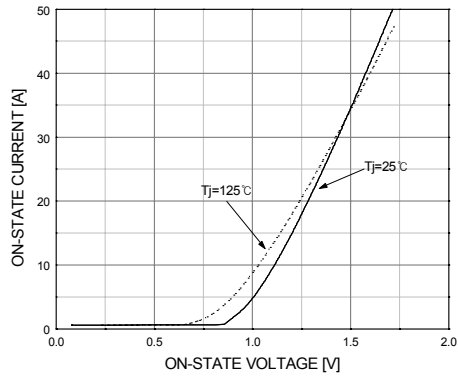


Figure 1. Maximum On-state Characteristics

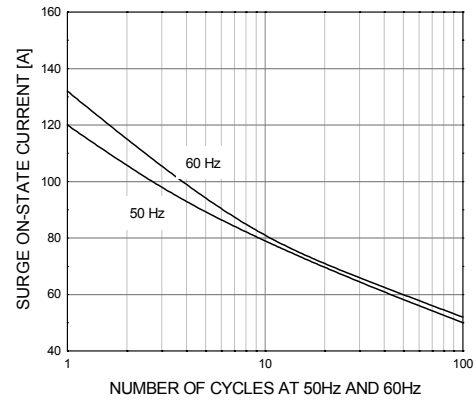


Figure 2. Rated Surge On-state Current

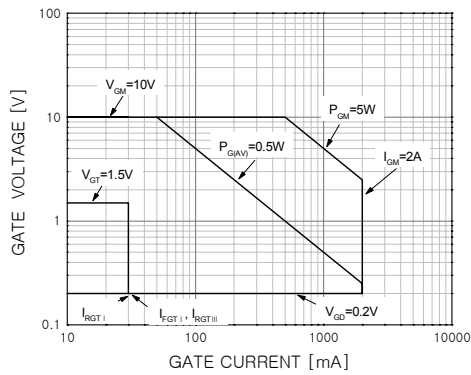


Figure 3. Gate Characteristics

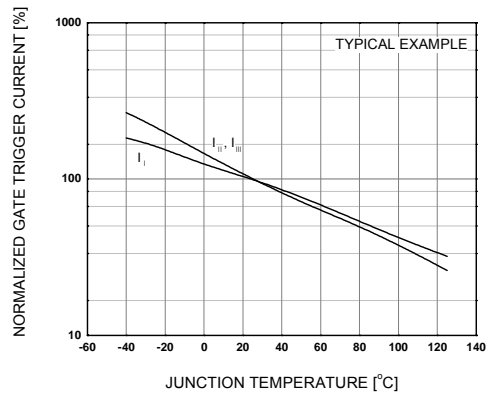


Figure 4. Gate Trigger Current vs T_j

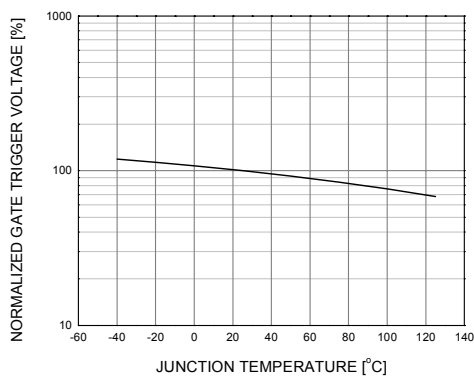


Figure 5. Gate Trigger Voltage vs T_j

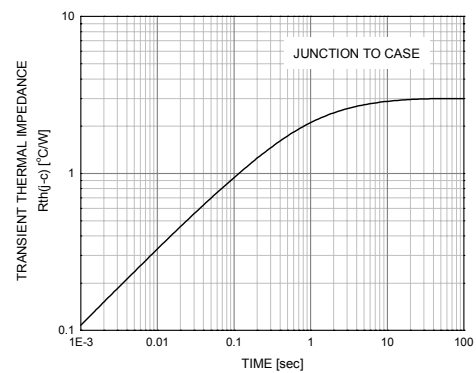


Figure 6. Transient Thermal Impedance

Typical Curves (Continues)

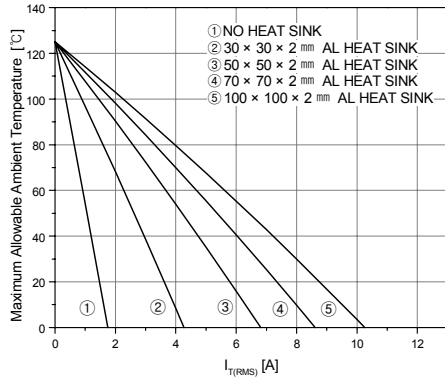


Figure 7. Allowable Ambient Temperature vs Rms On-state Current

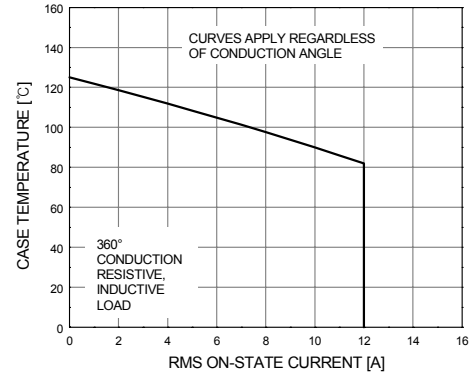


Figure 8. Allowable Case Temperature vs Rms On-state Current

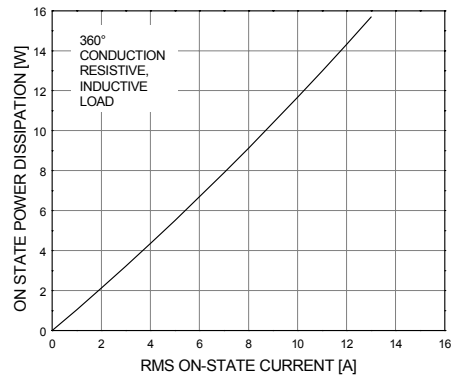


Figure 9. Maximum On-state Power Dissipation

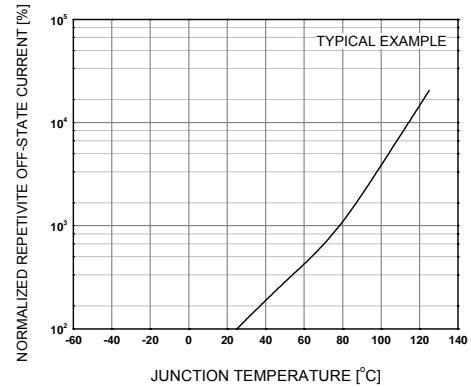


Figure 10. Repetitive Peak Off-state Current vs Junction Temperature

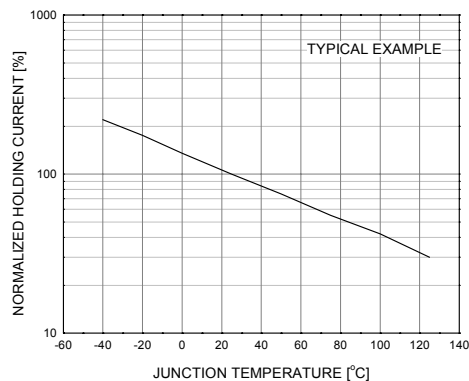


Figure 11. Holding Current vs Junction Temperature

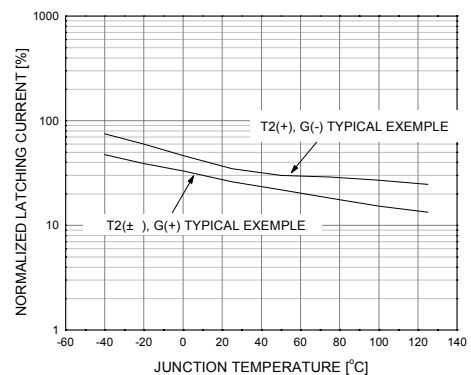


Figure 12. Latching Current vs Junction Temperature

Typical Curves (Continues)

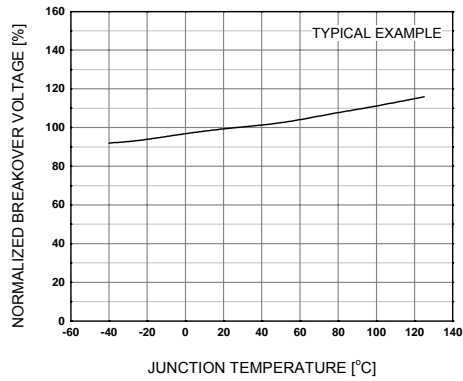


Figure 13. Breakover Voltage vs. Junction Temperature

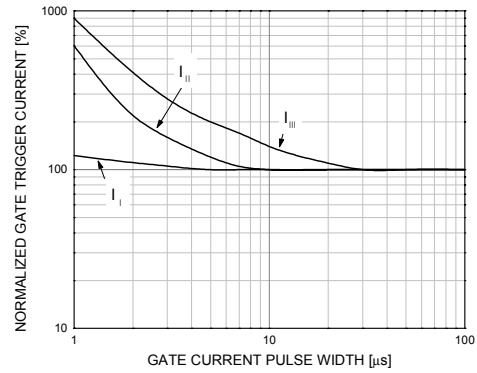


Figure 14. Gate Trigger Current vs. Gate Current Pulse Width

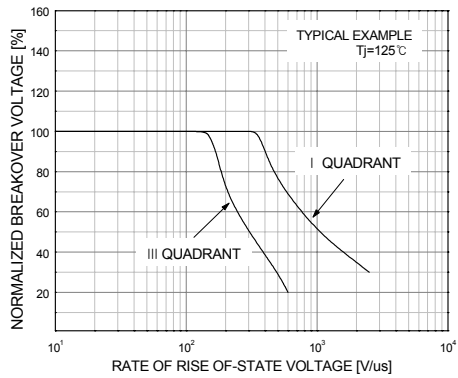


Figure 15. Breakover Voltage vs. Rate of Rise of Off-State Voltage

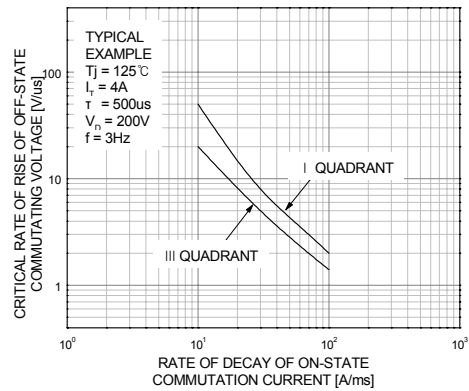
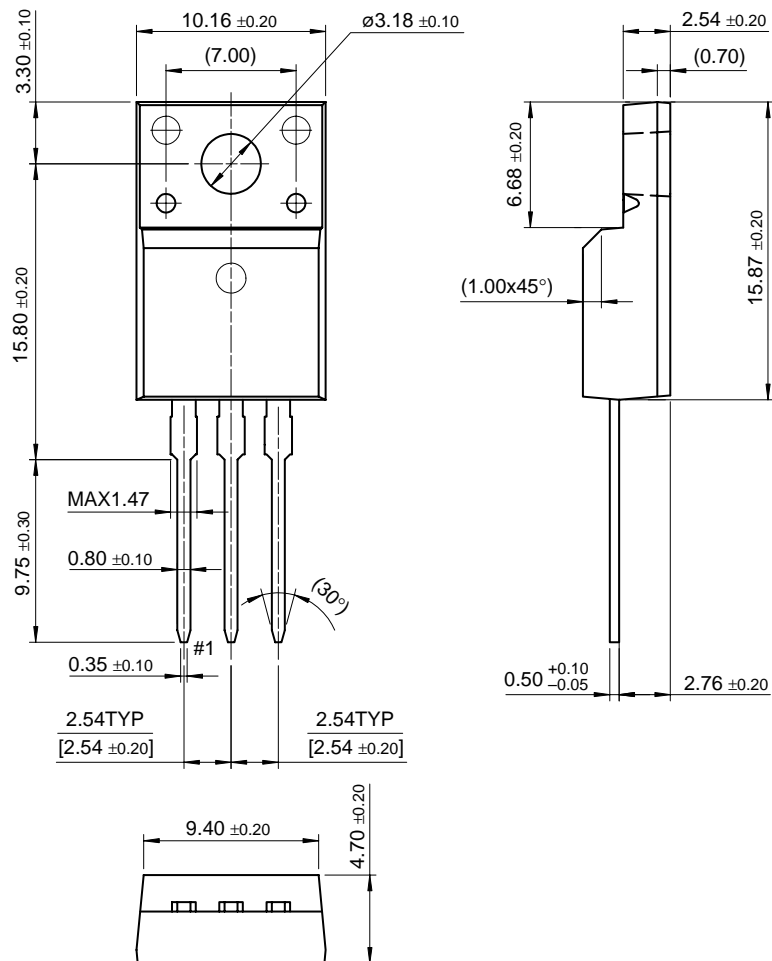


Figure 16. Commutation Characteristics

Package Dimension

TO-220F

FKPF12N80



Dimensions in Millimeters

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