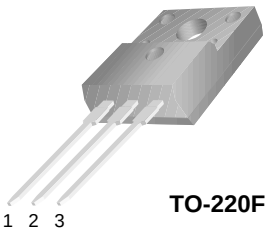
FKPF12N60 / FKPF12N80

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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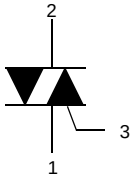


1: T_1
2: T_2
3: Gate

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

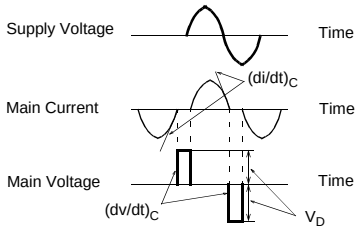
Thermal Characteristic

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