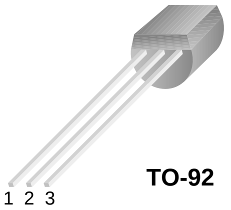
FAIRCHILD
SEMICONDUCTOR®

August 2006

FKN1N60SA
TRIAC (Silicon Bidirectional Thyristor)

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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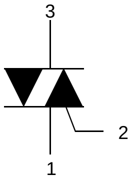


1: T_1
2: Gate
3: T_2

Absolute Maximum Ratings T_a = 25°C unless otherwise noted

Symbol	Parameter	Value		Rating	Units
V_{DRM} V_{RRM}	Peak Repetitive Off-State Voltage	Sine Wave 50 to 60Hz, Gate Open		600	V
$I_{T\ (RMS)}$	RMS On-State Current	Commercial frequency, sine full wave 360° conduction, Tc= 70 ℃		1.0	A
I_{TSM}	Surge On-State Current	Sinewave 1 full cycle, peak value, non-repetitive	50Hz	9	A
			60Hz	10	A
I^2t	I^2t for Fusing	Value corresponding to 1 cycle of halfwave, surge on-state current, tp=8.4ms		0.41	A^2s
P_{GM}	Peak Gate Power Dissipation			5	W
$P_{G\ (AV)}$	Average Gate Power Dissipation			0.1	W
V_{GM}	Peak Gate Voltage			5	V
I_{GM}	Peak Gate Current			1	A
T_J	Junction Temperature			- 40 ~ 125	°C
T_{STG}	Storage Temperature			- 40 ~ 125	°C

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case (note1)	40	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (note2)	160	°C/W

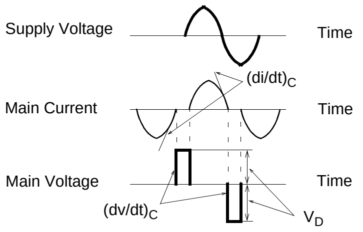
Note1: Infinite cooling condition.

Note2: JESD51-10 (Test Borad: FR4 3.0”*4.5”*0.062”, Minimum land pad)

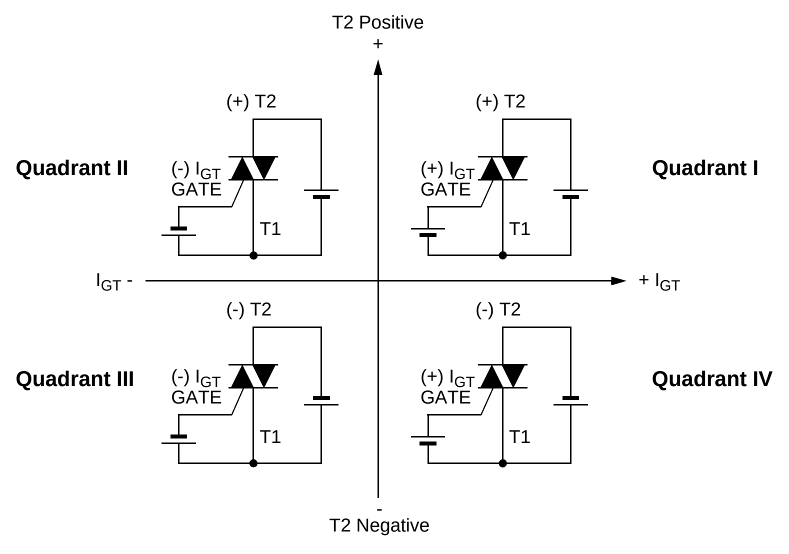
Electrical Characteristics T_C = 25°C unless otherwise noted

Symbol	Parameter		Test Condition		Min.	Typ.	Max.	Units
I_{DRM} I_{RRM}	Repetieive Peak Off-State Current		V_{DRM}/V_{RRM} applied		-	-	100	μA
V_{TM}	On-State Voltage		T_C=25°C, I_{TM}=1.12A Instantaneous measurement		-	-	1.8	V
V_{GT}	Gate Trigger Voltage	I	V_D=12V, R_L=100Ω	T2(+), Gate (+)	-	-	2.0	V
		II		T2(+), Gate (-)	-	-	2.0	V
		III		T2(-), Gate (-)	-	-	2.0	V
I_{GT}	Gate Trigger Current	I	V_D=12V, R_L=100Ω	T2(+), Gate (+)	-	-	5	mA
		II		T2(+), Gate (-)	-	-	5	mA
		III		T2(-), Gate (-)	-	-	5	mA
V_{GD}	Gate Non-Trigger Voltage		T_J=125°C, V_D=1/2V_{DRM}		0.2	-	-	V
I_H	Holding Current (I, II,III)		V_D = 12V, I_{TM} = 200mA		-	-	15	mA
I_L	Latching Current	I, III	V_D = 12V, I_G = 10mA		-	-	15	mA
		II			-	-	20	mA
dv/dt(s)	Critical Rate of Rise of Off-State Voltag		V_{DRM} = 63% Rated, T_j = 125°C, Exponential Rise		20	-	-	V/μs
dv/dt(c)	Critical-Rate of Rise of Off-State Commutating Voltage (di/dt=-0.7A/uS)				3.0	-	-	V/μs

Commutation dv/dt test

Device	Test Condition	Commutating voltage and current waveforms (inductive load)
FKN1N60SA	1. Junction Temperature T_J=125°C 2. Rate of decay of on-state commutating current (di/dt)$_C$ 3. Peak off-state voltage V_D = 300V	

Quadrant Definitions for a Triac



Package Marking and Ordering Information

Device Marking	Device	Package	Packing	Tape Width	Quantity
K1N60SA	FKN1N60SA	TO-92	Bulk	--	--

Typical Performance Characteristics

Figure 1. On-State Characteristics

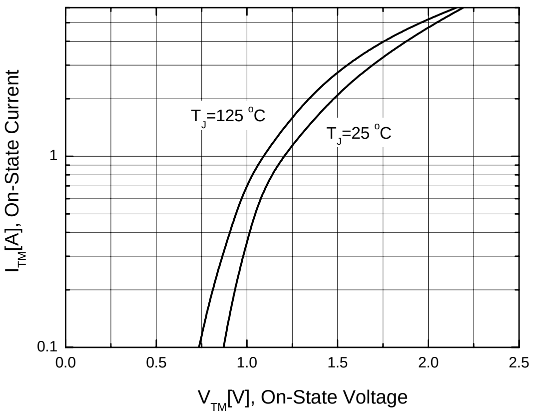


Figure 2. Power Dissipation

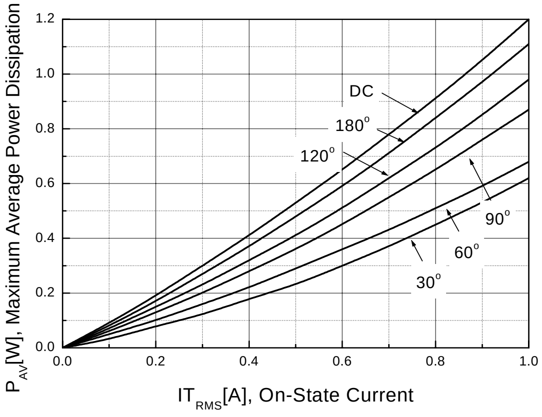


Figure 3. RMS Current Rating

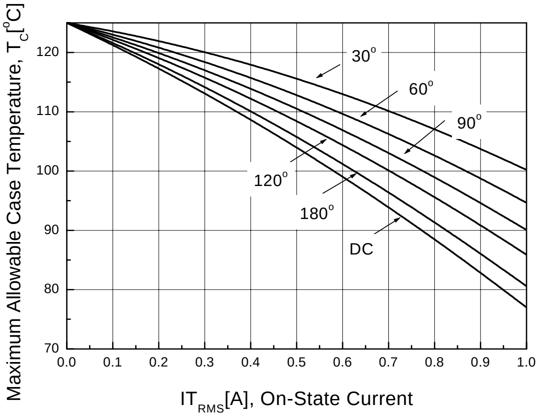


Figure 4. Typical Gate Trigger Current vs Junction Temperature

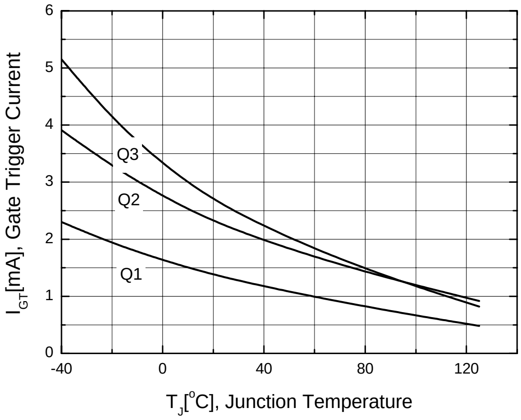


Figure5. Typical Gate Voltage vs Junction Temperarure

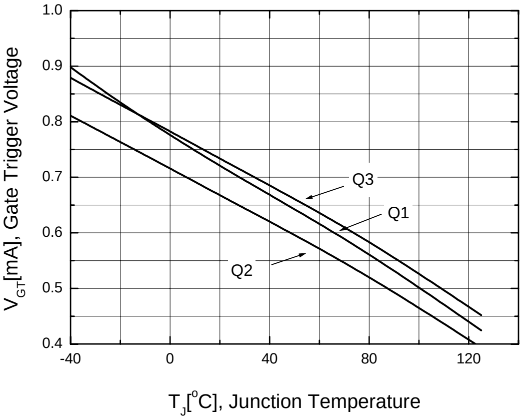
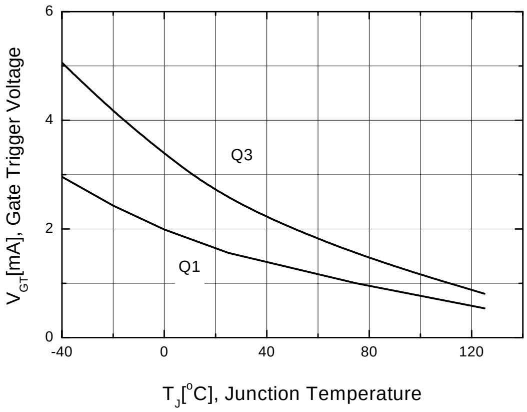


Figure6. Typical Latching Currrent vs Junction Temperature



Typical Performance Characteristics (Continued)

Figure7. Typical Holding Current vs Junction Temperature

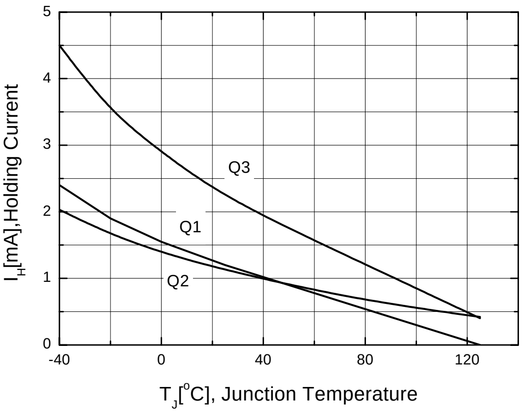
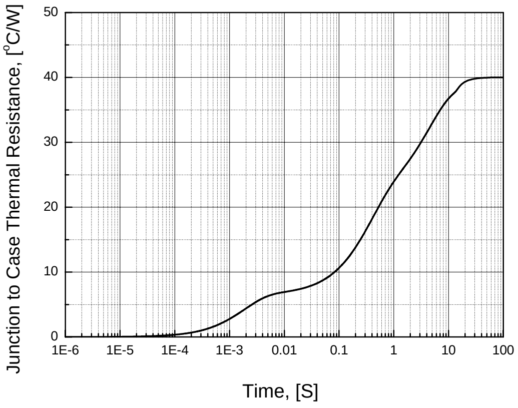
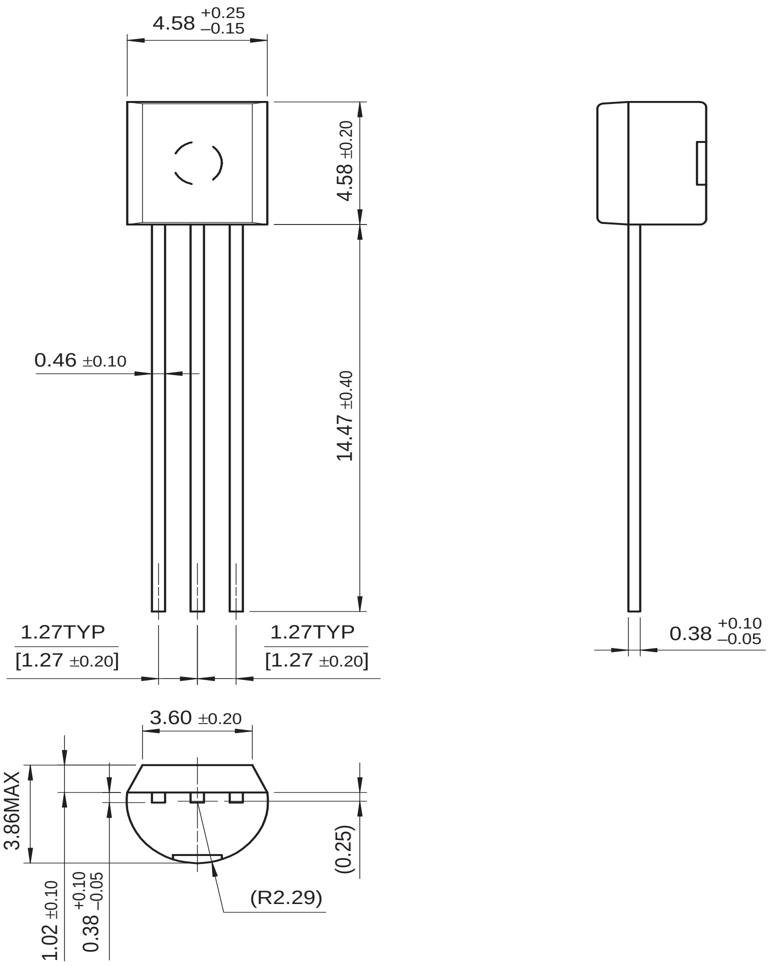


Figure8. Junction to Case Thermal Resistance



Package Dimension

TO-92



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