TAIWAN SEMICONDUCTOR

Pb **RoHS COMPLIANCE**

FR101S - FR107S
1.0 AMP. Fast Recovery Rectifiers
A-405

Features

✧ High efficiency, Low VF
✧ High current capability
✧ High reliability
✧ High surge current capability
✧ Low power loss.
✧ Green compound with suffix "G" on packing code & prefix "G" on datecode.

Mechanical Data

✧ Cases: Molded plastic
✧ Epoxy: UL 94V-0 rate flame retardant
✧ Lead: Pure tin plated, Lead free., solderable per MIL-STD-202, Method 208 guaranteed
✧ Polarity: Color band denotes cathode end
✧ High temperature soldering guaranteed: $260^{o}C/10$ seconds/.375",(9.5mm) lead lengths at 5 lbs.,(2.3kg) tension
✧ Weight: 0.22grams

.107 (2.7) .080 (2.0) DIA.
1.0 (25.4) MIN.
.205 (5.2) .166 (4.2)
1.0 (25.4) MIN.
.025 (.64) .021 (.53) DIA.
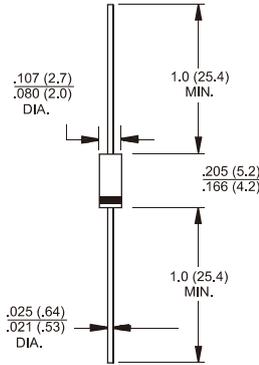
Dimensions in inches and (millimeters)

Marking Diagram

FR10XS SGYWW

FR10XS = Specific Device Code
G = Green Compound
Y = Year
WW = Work Week

Maximum Ratings and Electrical Characteristics

Rating at 25 ^{o}C ambient temperature unless otherwise specified.
Single phase, half wave, 60 Hz, resistive or inductive load.
For capacitive load, derate current by 20%

Type Number	Symbol	FR 101S	FR 102S	FR 103S	FR 104S	FR 105S	FR 106S	FR 107S	Units
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum Average Forward Rectified Current .375"(9.5mm) Lead Length @T_A = 55 ^{o}C	$I_{F(AV)}$	1.0							A
Peak Forward Surge Current, 8.3 ms Single Half Sine-wave Superimposed on Rated Load (JEDEC method)	I_{FSM}	30							A
Maximum Instantaneous Forward Voltage @ 1.0A	V_F	1.2							V
Maximum DC Reverse Current at @ T_A=25 ^{o}C Rated DC Blocking Voltage (Note 1) @ T_A=125 ^{o}C	I_R	5.0 150							uA uA
Maximum Reverse Recovery Time (Note 4)	Trr	150					250	500	nS
Typical Junction Capacitance (Note 2)	Cj	10							pF
Typical Thermal Resistance (Note 3)	$R_{\theta JA}$	90							^{o}C/W
Operating Temperature Range	T_J	-65 to +150							^{o}C
Storage Temperature Range	T_{STG}	-65 to +150							^{o}C

Notes: 1. Pulse Test with PW=300 usec,1% Duty Cycle
2. Measured at 1 MHz and Applied Reverse Voltage of 4.0 Volts D.C.
3. Mount on Cu-Pad Size 5mm x 5mm on P.C.B.
4. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, I_{RR}=0.25A

Version: C10

RATINGS AND CHARACTERISTIC CURVES (FR101S THRU FR107S)

FIG.1- MAXIMUM FORWARD CURRENT DERATING CURVE

AVERAGE FORWARD CURRENT. (A)
AMBIENT TEMPERATURE. (°C)

Single Phase
Half Wave 60Hz
Resistive or
Inductive Load
0.375" (9.5mm)
Lead Length
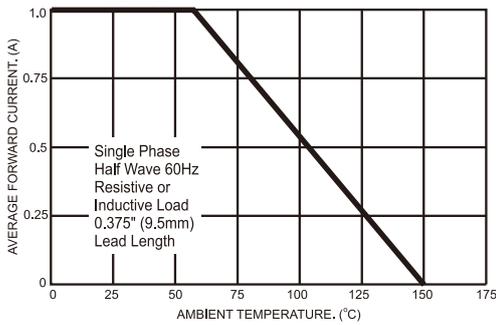
FIG.2- TYPICAL REVERSE CHARACTERISTICS PER LEG

INSTANTANEOUS REVERSE CURRENT. (µA)
PERCENT OF RATED PEAK REVERSE VOLTAGE. (%)

Tj=125°C
Tj=75°C
Tj=25°C
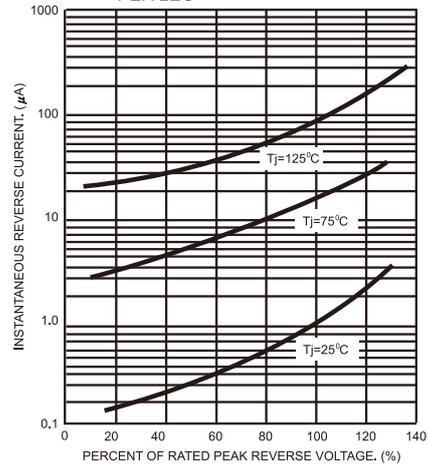
FIG.3- MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

PEAK FORWARD SURGE CURRENT. (A)
NUMBER OF CYCLES AT 60Hz

8.3ms Single Half Sine Wave
JEDEC Method

FIG.4- TYPICAL JUNCTION CAPACITANCE

JUNCTION CAPACITANCE.(pF)
REVERSE VOLTAGE. (V)

Tj=25°C
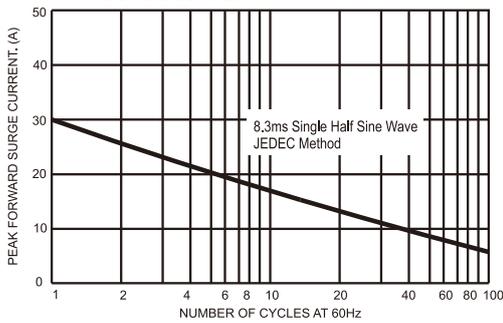
FIG.5- TYPICAL FORWARD CHARACTERISTICS

INSTANTANEOUS FORWARD CURRENT. (A)
FORWARD VOLTAGE. (V)
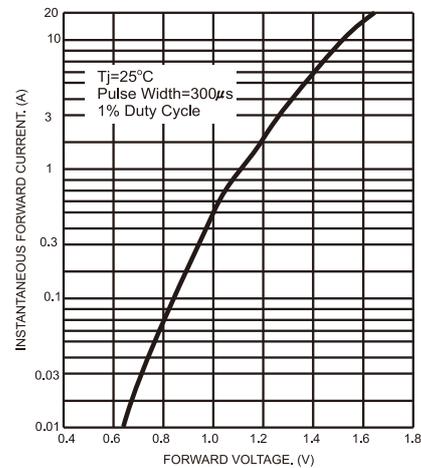
Tj=25°C
Pulse Width=300µs
1% Duty Cycle
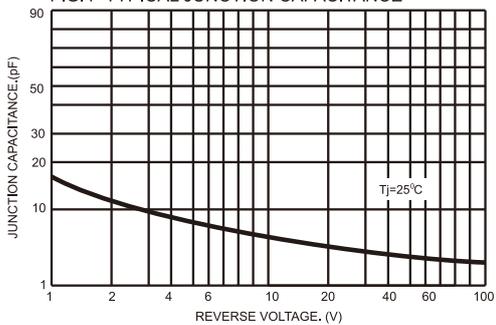
FIG.6- REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM

50Ω NONINDUCTIVE
10Ω NONINDUCTIVE
DUT
(+) 50Vdc (approx) (-)
1Ω NON INDUCTIVE
OSCILLOSCOPE (NOTE 1)
PULSE GENERATOR (NOTE 2)
(-)
(+)

NOTES: 1. Rise Time=7ns max. Input Impedance=
1 megohm 22pf
2. Rise Time=10ns max. Sourse Impedance=
50 ohms

+0.5A
trr
0
-0.25A
-1.0A
1cm
SET TIME BASE FOR
5/ 10ns/ cm

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