

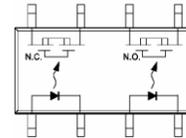
# SSR Relay NO+NC/1A+1B AC/DC 60V 0.4A SOP-8

SSRAB1IA40S8

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## FEATURE

- Normally Open + Normally Close (1-Form-A/B) Solid State Relay
- AC/DC Output Load Compatible
- Isolation Voltage: 1500 Vrms
- Application: Programmable Controller, Industrial I/O Module, Communication Equipment Protection
- In Accordance with Safety Class UL 1577 Standard



## MAXIMUM RATINGS

| Parameter                    | Symbol     | Value    | Unit      |
|------------------------------|------------|----------|-----------|
| Input Continuous LED Current | $I_F$      | 50       | mA        |
| Input Peak LED Current       | $I_{FP}$   | 1        | A         |
| Input LED Reverse Voltage    | $V_R$      | 5        | V         |
| Input Power Dissipation      | $P_{in}$   | 75       | mW        |
| Output Load Voltage          | $V_L$      | 60       | V         |
| Output Load Current          | $I_L$      | 0.4      | A         |
| Output Peak Load Current     | $I_{Peak}$ | 1.0      | A         |
| Output Power Dissipation     | $P_{out}$  | 450      | mW        |
| Total Power Dissipation      | $P_T$      | 500      | mW        |
| Isolation Voltage            | $V_{ISO}$  | 1500     | $V_{RMS}$ |
| Operating Temperature Range  | $T_{Opr}$  | -40~+85  | °C        |
| Storage Temperature Range    | $T_{Stg}$  | -40~+100 | °C        |
| Soldering Temperature        | $T_{SOL}$  | 260      | °C        |

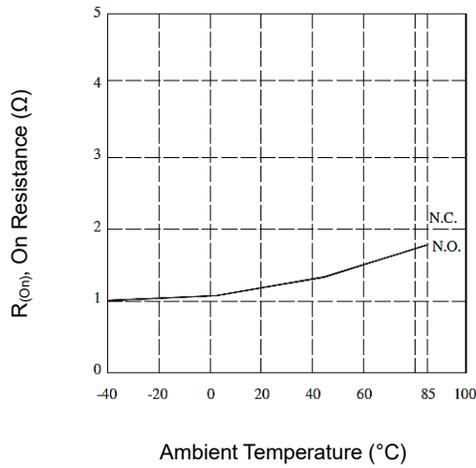
## ELECTRICAL CHARACTERISTICS

| Input Characteristics        | Conditions   | Symbol       | Min       | Typ.       | Max       | Unit     |
|------------------------------|--|--------------|-----------|------------|-----------|----------|
| LED Forward Voltage          | $I_F=10mA$   | $V_F$        | --        | 1.2        | 1.4       | V        |
| Operation LED Current        | --   | $I_{F(On)}$  | --        | 0.5        | 3.0       | mA       |
| Recovery LED Current         | --   | $I_{F(off)}$ | --        | 0.35       | 0.5       | mA       |
| Recovery LED Voltage         | --   | $V_{F(off)}$ | 0.5       | --         | --        | V        |
| Output Characteristics       | Conditions   | Symbol       | Min       | Typ.       | Max       | Unit     |
| On-Resistance                | $I_F=5mA$ (N.O.), $I_F=0mA$ (N.C.),<br>$I_L=100mA$ ,<br>Time to flow is within 1 sec | $R_{(On)}$   | --        | 1.0(N.O.)  | 1.4(N.O.) | $\Omega$ |
|                              |  |              |           | 1.0(N.C.)  | 3.0(N.C.) |          |
| Off-State Leakage Current    | $I_F=0mA$ (N.O.), $I_F=5mA$ (N.C.),<br>$V_L=Rating$                                  | $I_{Leak}$   | --        | --         | 10        | $\mu A$  |
| Output Capacitance           | $I_F=5mA$ , $V_L=0$ , $f=1MHz$   | $C_{out}$    | --        | 165        | --        | pF       |
| Transmission Characteristics | Conditions   | Symbol       | Min       | Typ.       | Max       | Unit     |
| Turn-On Time                 | $I_F=5mA$ , $I_L=50mA$   | $t_{on}$     | --        | 0.23(N.O.) | 0.5(N.O.) | ms       |
|                              |  |              | --        | 0.02(N.C.) | 1.0(N.C.) |          |
| Turn-Off Time                | $I_F=5mA$ , $I_L=50mA$   | $t_{off}$    | --        | 0.03(N.O.) | 0.2(N.O.) | ms       |
|                              |  |              | --        | 0.5(N.C.)  | 3.0(N.C.) |          |
| Coupled Characteristics      | Conditions   | Symbol       | Min       | Typ.       | Max       | Unit     |
| I/O Isolation Resistance     | $V_{IO}=500V_{DC}$   | $R_{IO}$     | $10^{10}$ | --         | --        | $\Omega$ |
| I/O Capacitance              | $f=1MHz$   | $C_{IO}$     | --        | 0.8        | --        | pF       |

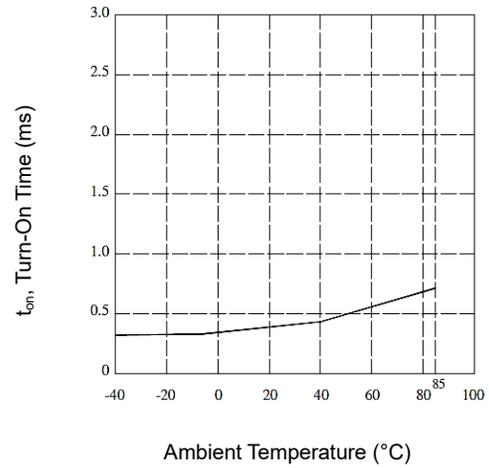
Note:  $T_A=25^\circ C$  unless otherwise noted.

**CHARACTERISTIC CURVES**

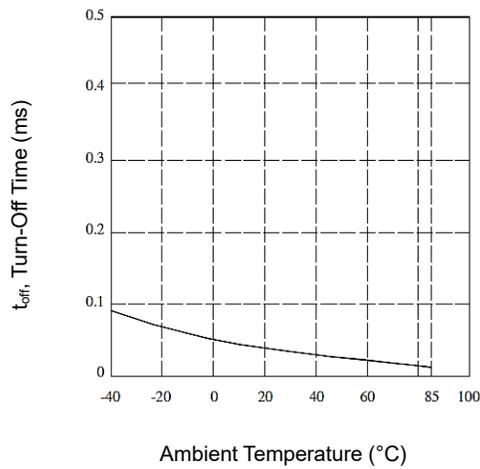
**On Resistance vs. Temperature**



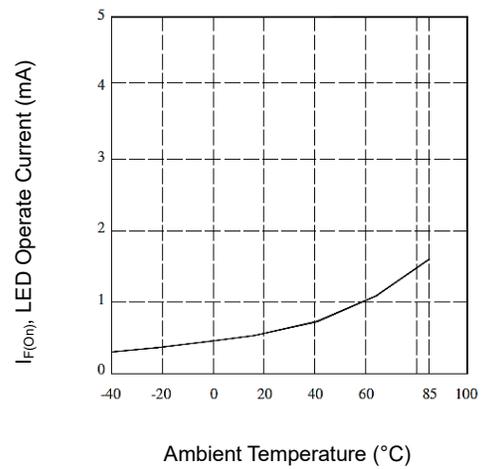
**Turn-On Time vs. Temperature**



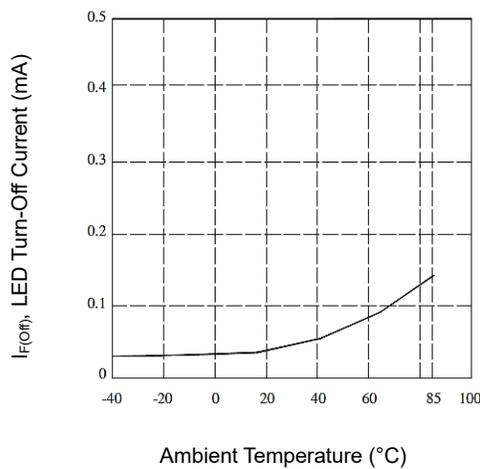
**Turn-Off Time vs. Temperature**



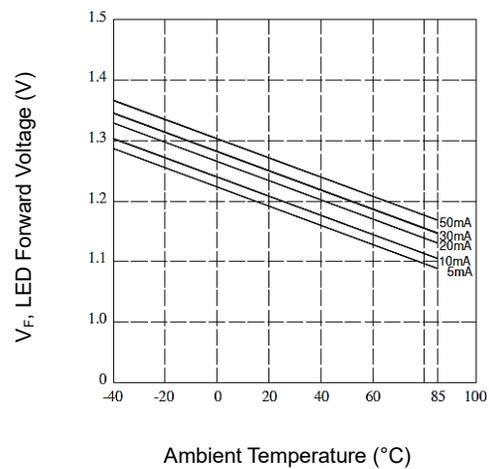
**LED Operate Current vs. Temperature**



**LED Turn-Off Current vs. Temperature**



**LED Forward Voltage vs. Temperature**



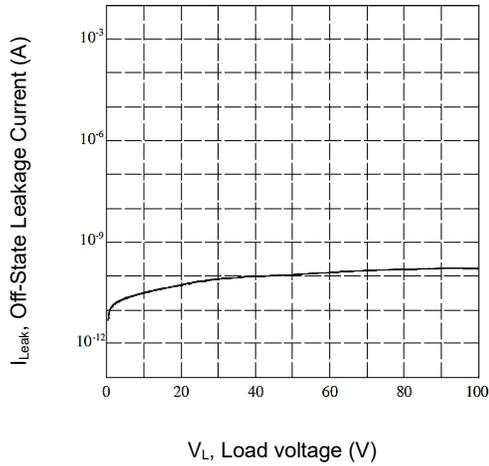
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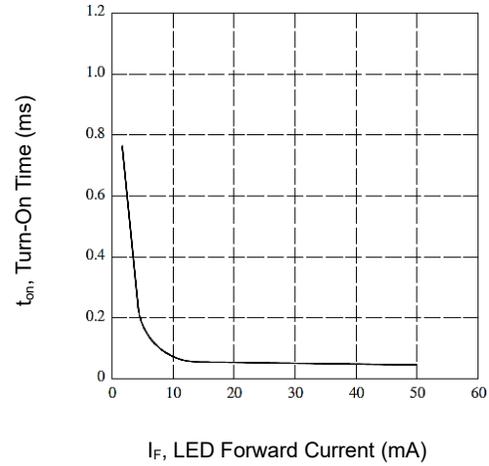
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## CHARACTERISTIC CURVES

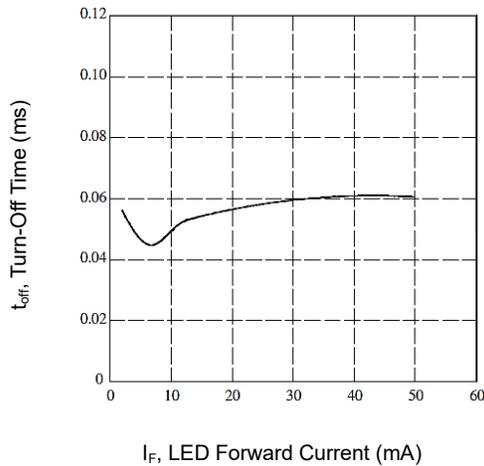
Off-State Leakage Current vs. Load Voltage



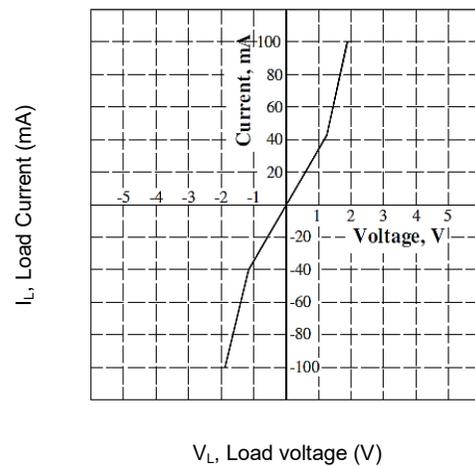
LED Forward Current vs. Turn-On Time



LED Forward Current vs. Turn-Off Time



V-I Characteristics of Output MOS



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**DIMENSIONS**

| Item | Min (mm) | Max (mm) |
|------|----------|----------|
| A1   | --       | 0.10     |
| A2   | 1.80     | 2.20     |
| b    | 0.30     | 0.50     |
| D    | 9.20     | 9.60     |
| E    | 6.40     | 7.20     |
| E1   | 4.20     | 4.60     |
| e    | 2.54     |          |
| e1   | 5.08     |          |
| L    | 0.46     | 0.86     |
| X    | 0.80     |          |
| X1   | 7.62     |          |
| Y    | 1.20     |          |
| Y1   | 7.20     |          |

Note:

1,3.LED Anode; 2,4.LED Cathode; 5,6. Drain (MOSFET) 1A; 7,8. Drain (MOSFET) 1B

