

# MOS FET Relays

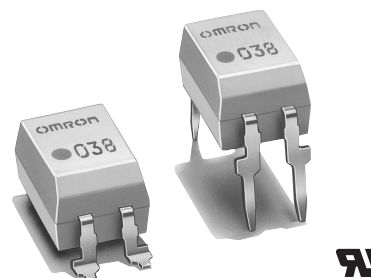
# G3VM-353A/A1/D/D1

## Analog-switching MOS FET Relays with SPST-NC Contact. General-purpose Models Added.

- Switches AC and DC minute analog signals.
- General-purpose models (high ON resistance) added.
- RoHS compliant

### Application Examples

- Electronic automatic exchange systems
- Security systems
- Datacom (modem) systems
- FA systems and Measurement devices



Note: The actual product is marked differently from the image shown here.

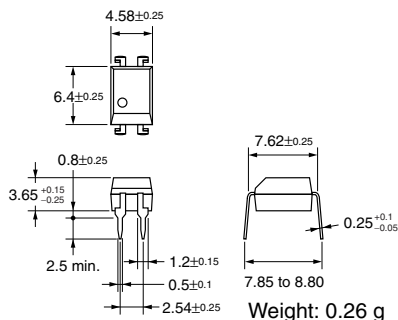
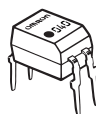
### List of Models

| Contact form | Terminals                  | Load voltage (peak value) | Model          | Number per stick | Number per tape |
|--------------|----------------------------|---------------------------|----------------|------------------|-----------------|
| SPST-NC      | PCB terminals              | 350 VAC                   | G3VM-353A      | 100              | ---             |
|              |                            |                           | G3VM-353A1     |                  |                 |
|              |                            |                           | G3VM-353D      |                  |                 |
|              |                            |                           | G3VM-353D1     |                  |                 |
|              | Surface-mounting terminals |                           | G3VM-353D(TR)  | ---              | 1,500           |
|              |                            |                           | G3VM-353D1(TR) |                  |                 |

### Dimensions

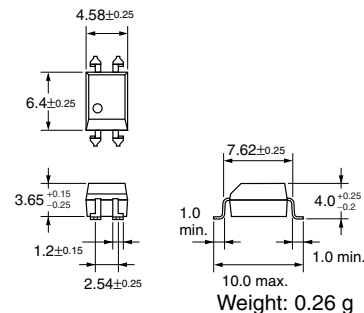
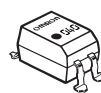
Note: All units are in millimeters unless otherwise indicated.

#### G3VM-353A/A1



Note: The actual product is marked differently from the image shown here.

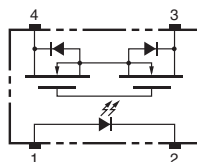
#### G3VM-353D/D1



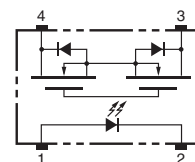
Note: The actual product is marked differently from the image shown here.

### Terminal Arrangement/Internal Connections (Top View)

#### G3VM-353A/A1

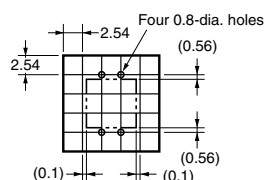


#### G3VM-353D/D1



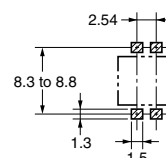
### PCB Dimensions (Bottom View)

#### G3VM-353A/A1



### Actual Mounting Pad Dimensions (Recommended Value, Top View)

#### G3VM-353D/D1



■ Absolute Maximum Ratings (Ta = 25°C)

| Item   |                                      | Symbol                         | Rating      | Unit      | Measurement Conditions        |
|--|--------------------------------------|--------------------------------|-------------|-----------|-------------------------------|
| Input  | LED forward current                  | $I_F$                          | 50          | mA        |                               |
|  | Repetitive peak LED forward current  | $I_{FP}$                       | 1           | A         | 100 $\mu$ s pulses, 100 pps   |
|  | LED forward current reduction rate   | $\Delta I_F/^\circ\text{C}$    | -0.5        | mA/°C     | $T_a \geq 25^\circ\text{C}$   |
|  | LED reverse voltage                  | $V_R$                          | 5           | V         |                               |
|  | Connection temperature               | $T_j$                          | 125         | °C        |                               |
| Output   | Load voltage (AC peak/DC)            | $V_{OFF}$                      | 350         | V         |                               |
|  | Continuous load current (AC peak/DC) | $I_O$                          | 150 (100)   | mA        |                               |
|  | ON current reduction rate            | $\Delta I_{ON}/^\circ\text{C}$ | -1.5 (-1)   | mA/°C     | $T_a \geq 25^\circ\text{C}$   |
|  | Connection temperature               | $T_j$                          | 125         | °C        |                               |
| Dielectric strength between input and output (See note 1.) |                                      | $V_{I-O}$                      | 2,500       | $V_{rms}$ | AC for 1 min                  |
| Operating temperature                                      |                                      | $T_a$                          | -40 to +85  | °C        | With no icing or condensation |
| Storage temperature  |                                      | $T_{stg}$                      | -55 to +125 | °C        | With no icing or condensation |
| Soldering temperature (10 s)                               |                                      | ---                            | 260         | °C        | 10 s                          |

Note: 1. The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

Values in parentheses are for the G3VM-353A1/D1.

■ Electrical Characteristics (Ta = 25°C)

| Item                           |  | Symbol     | Minimum | Typical        | Maximum   | Unit             | Measurement conditions  |
|--------------------------------|--|------------|---------|----------------|-----------|------------------|---|
| Input                          | LED forward voltage                    | $V_F$      | 1.0     | 1.15           | 1.3       | V                | $I_F = 10 \text{ mA}$   |
|                                | Reverse current                        | $I_R$      | ---     | ---            | 10        | $\mu\text{A}$    | $V_R = 5 \text{ V}$   |
|                                | Capacity between terminals             | $C_T$      | ---     | 30             | ---       | pF               | $V = 0, f = 1 \text{ MHz}$  |
|                                | Trigger LED forward current            | $I_{FT}$   | ---     | 1              | 3         | mA               | $I_{OFF} = 10 \mu\text{A}$  |
| Output                         | Maximum resistance with output ON      | $R_{ON}$   | ---     | 15 (30)        | 25 (50)   | $\Omega$         | $I_O = 150 \text{ mA (100 mA)}$   |
|                                | Current leakage when the relay is open | $I_{LEAK}$ | ---     | 0.0105 (0.003) | 1.0       | $\mu\text{A}$    | $I_F = 5 \text{ mA}, V_{OFF} = 350 \text{ V}$                               |
|                                | Capacity between terminals             | $C_{OFF}$  | ---     | 85 (30)        | ---       | pF               | $V = 0, f = 1 \text{ MHz}, I_F = 5 \text{ mA}$                              |
| Capacity between I/O terminals |  | $C_{I-O}$  | ---     | 0.8            | ---       | pF               | $f = 1 \text{ MHz}, V_s = 0 \text{ V}$                                      |
| Insulation resistance          |  | $R_{I-O}$  | 1,000   | ---            | ---       | $\text{M}\Omega$ | $V_{I-O} = 500 \text{ VDC}, R_{OH} \leq 60\%$                               |
| Turn-ON time                   |  | $t_{ON}$   | ---     | 0.1 (0.25)     | 1.0 (0.5) | ms               | $I_F = 5 \text{ mA}, R_L = 200 \Omega, V_{DD} = 20 \text{ V}$ (See note 2.) |
| Turn-OFF time                  |  | $t_{OFF}$  | ---     | 1.0 (0.5)      | 3.0 (1)   | ms               |   |

Values in parentheses are for the G3VM-353A1/D1.

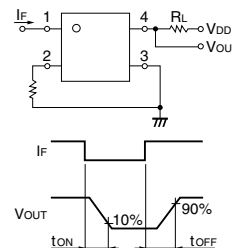
■ Recommended Operating Conditions

Use the G3VM under the following conditions so that the Relay will operate properly.

| Item                                 | Symbol   | Minimum | Typical | Maximum   | Unit |
|--------------------------------------|----------|---------|---------|-----------|------|
| Load voltage (AC peak/DC)            | $V_{DD}$ | ---     | ---     | 280       | V    |
| Operating LED forward current        | $I_F$    | 5       | ---     | 25        | mA   |
| Continuous load current (AC peak/DC) | $I_O$    | ---     | ---     | 150 (100) | mA   |
| Operating temperature                | $T_a$    | -20     | ---     | 65        | °C   |

Values in parentheses are for the G3VM-353A1/D1.

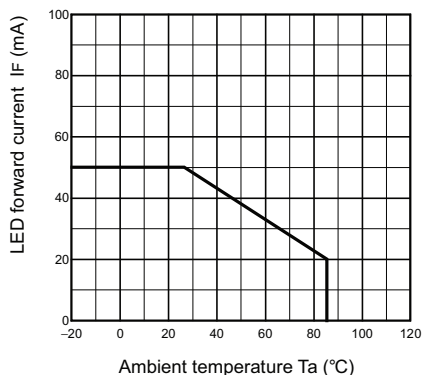
Note: 2. Turn-ON and Turn-OFF Times



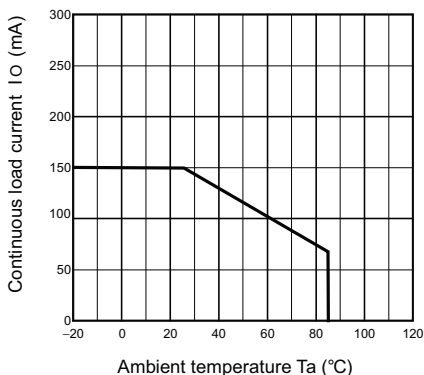
■ Engineering Data

G3VM-353A/D

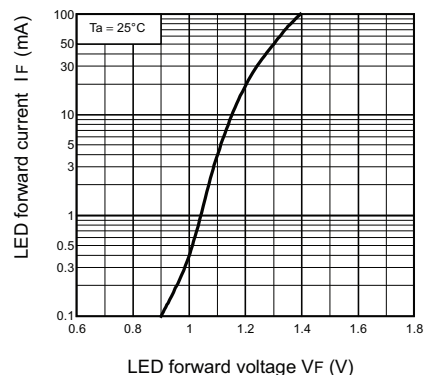
LED forward current vs. Ambient temperature  
IF - Ta



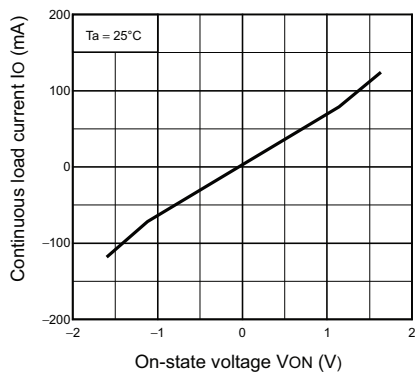
Continuous load current vs. Ambient temperature  
IO - Ta



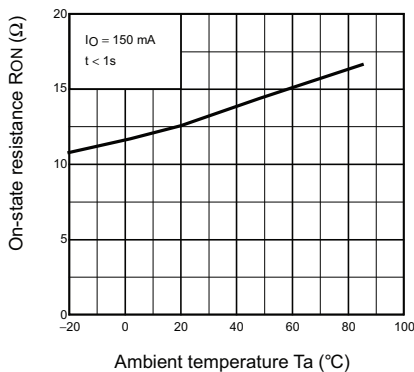
LED forward current vs. LED forward voltage  
IF - VF



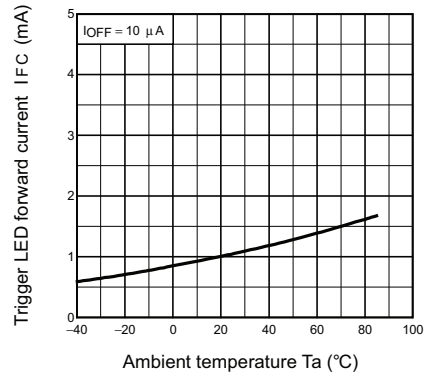
Continuous load current vs. On-state voltage  
IO - VON



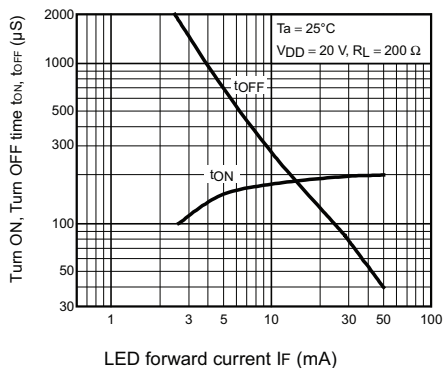
On-state resistance vs. Ambient temperature  
RON - Ta



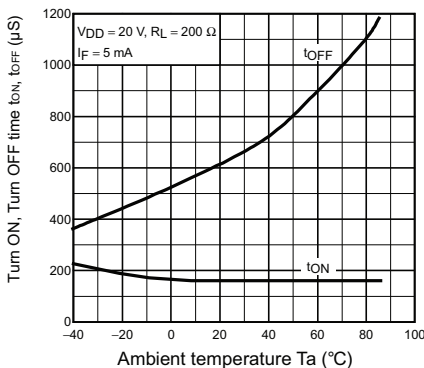
Trigger LED forward current vs. Ambient temperature  
IFC - Ta



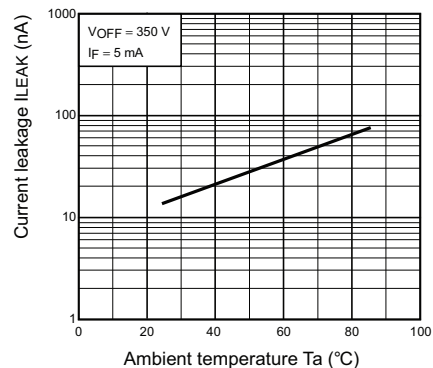
Turn ON, Turn OFF time vs. LED forward current  
tON, tOFF - IF



Turn ON, Turn OFF time vs. Ambient temperature  
tON, tOFF - Ta



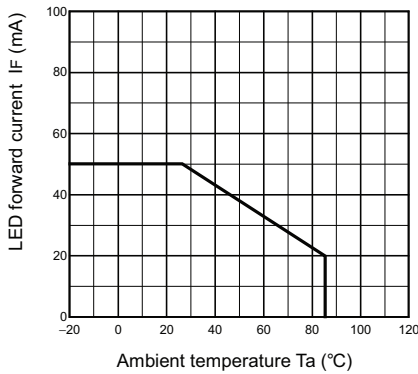
Current leakage vs. Ambient temperature  
ILEAK - Ta



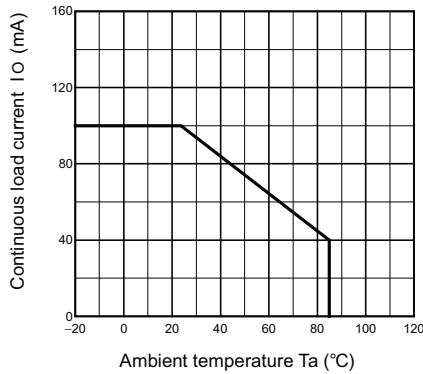
■ Engineering Data

G3VM-353A1/D1

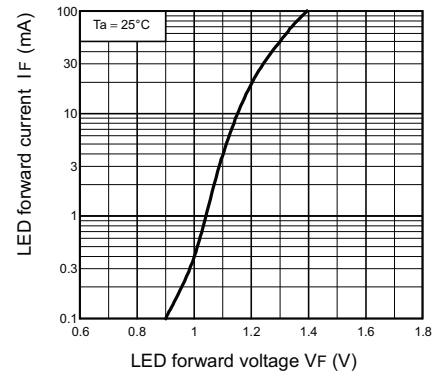
LED forward current vs. Ambient temperature  
IF - Ta



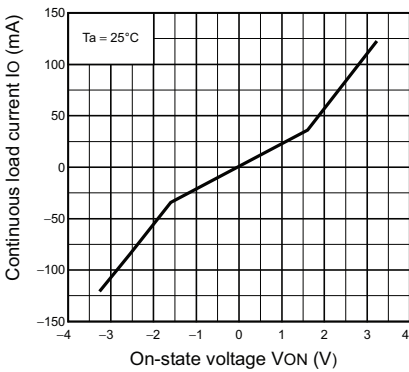
Continuous load current vs. Ambient temperature  
IO - Ta



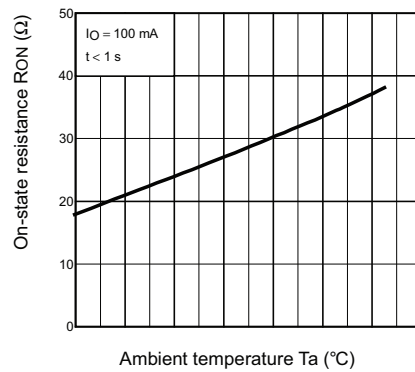
LED forward current vs. LED forward voltage  
IF - VF



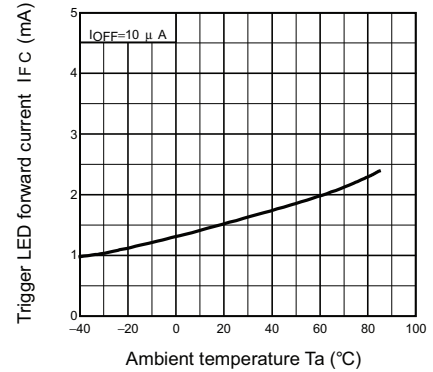
Continuous load current vs. On-state voltage  
IO - VON



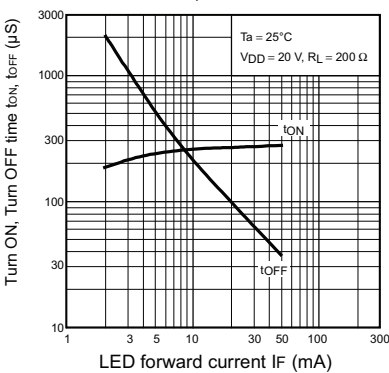
On-state resistance vs. Ambient temperature  
RON - Ta



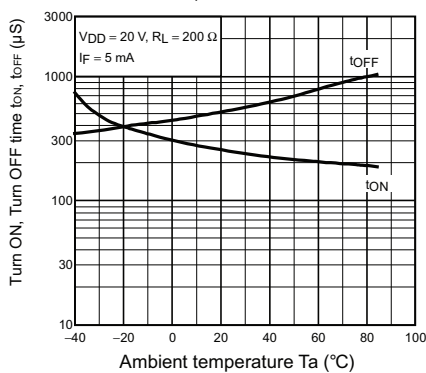
Trigger LED forward current vs. Ambient temperature  
IFC - Ta



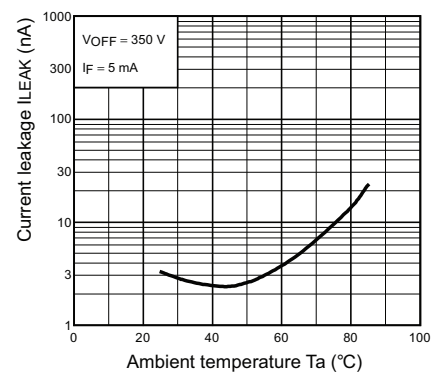
Turn ON, Turn OFF time vs. LED forward current  
tON, tOFF - IF

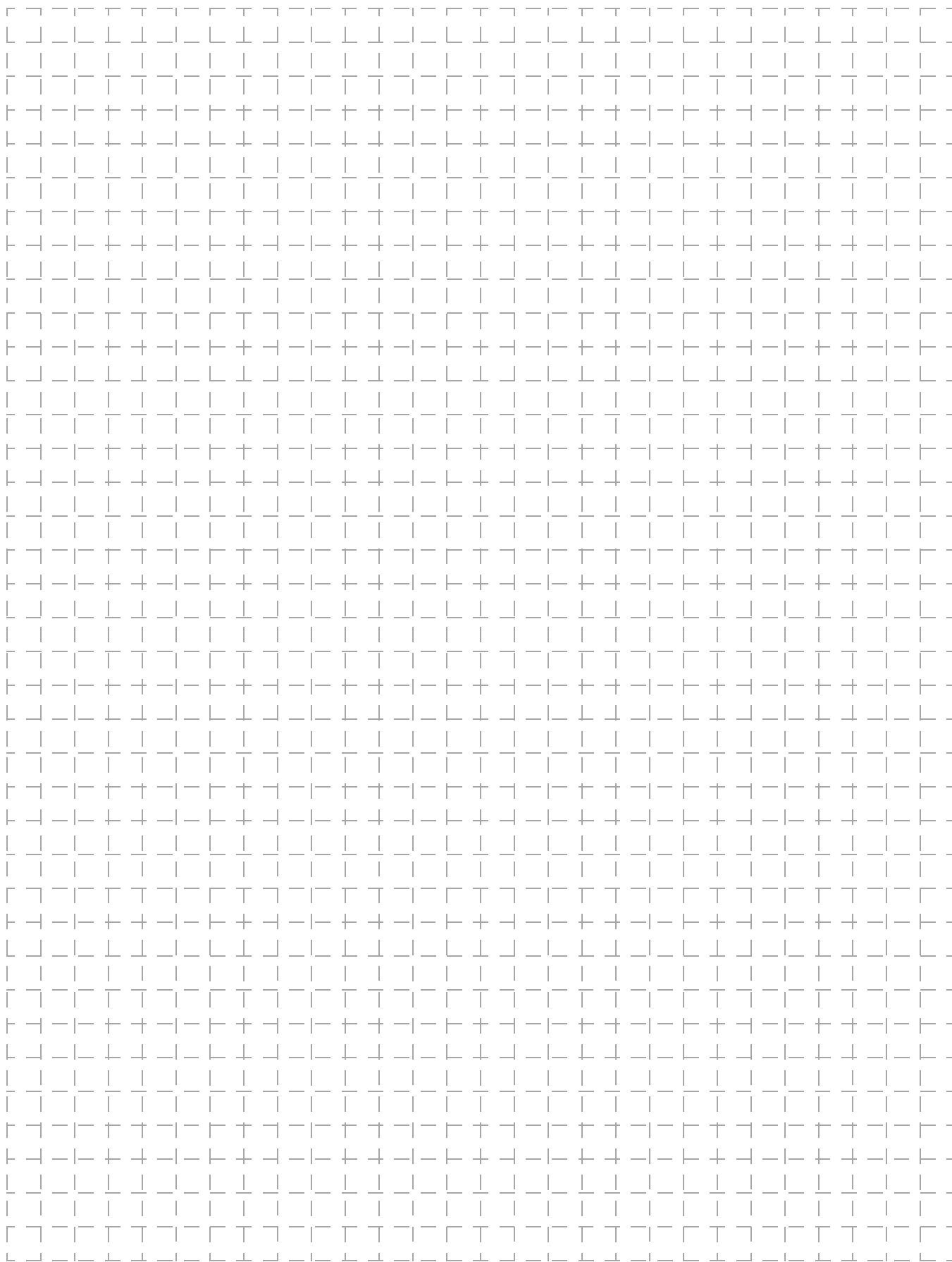


Turn ON, Turn OFF time vs. Ambient temperature  
tON, tOFF - Ta



Current leakage vs. Ambient temperature  
ILEAK - Ta





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