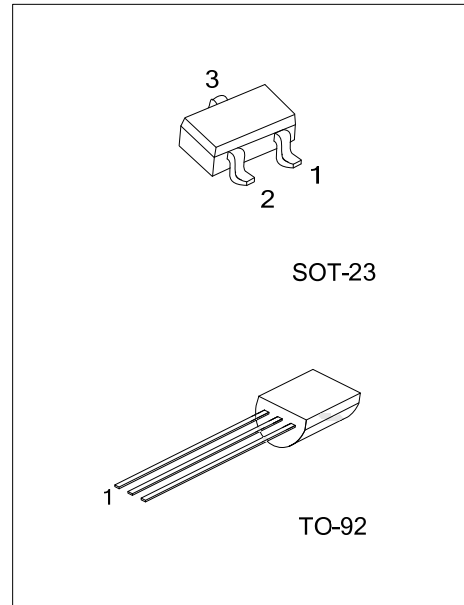


**XL/ML1225****SCR****MEDIUM POWER LOW  
VOLTAGE TRANSISTOR****■ DESCRIPTION**

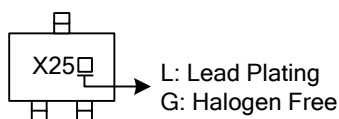
The **XL1225/ML1225** silicon controlled rectifiers are high performance planar diffused PNP devices. These parts are intended for low cost high volume applications.

**■ ORDERING INFORMATION**

| Ordering Number |                 |                 | Package | Pin Assignment |   |   | Packing   |
|-----------------|-----------------|-----------------|---------|----------------|---|---|-----------|
| Normal          | Lead Free       | Halogen Free    |         | 1              | 2 | 3 |           |
| XL1225-x-AE3-R  | XL1225L-x-AE3-R | XL1225G-x-AE3-R | SOT-23  | G              | K | A | Tape Reel |
| XL1225-x-T92-B  | XL1225L-x-T92-B | XL1225G-x-T92-B | TO-92   | K              | G | A | Tape Box  |
| XL1225-x-T92-K  | XL1225L-x-T92-K | XL1225G-x-T92-K | TO-92   | K              | G | A | Bulk      |
| XL1225-x-T92-R  | XL1225L-x-T92-R | XL1225G-x-T92-R | TO-92   | K              | G | A | Tape Reel |
| ML1225-x-AE3-R  | ML1225L-x-AE3-R | ML1225G-x-AE3-R | SOT-23  | G              | K | A | Tape Reel |
| ML1225-x-T92-B  | ML1225L-x-T92-B | ML1225G-x-T92-B | TO-92   | K              | G | A | Tape Box  |
| ML1225-x-T92-K  | ML1225L-x-T92-K | ML1225G-x-T92-K | TO-92   | K              | G | A | Bulk      |
| ML1225-x-T92-R  | ML1225L-x-T92-R | ML1225G-x-T92-R | TO-92   | K              | G | A | Tape Reel |

Note: G: Gate, K: Cathode, A: Anode

|                                                                                                                                 |                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>XL1225L-xx-T92-K</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Rank</p> <p>(4) Lead Free</p> <p>(5) XL / ML</p> | <p>(1) B: Tape Box, K: Bulk, R: Tape Reel</p> <p>(2) T92: TO-92, AE3: SOT-23</p> <p>(3) Refer to CLASSIFICATION OF <math>I_{GT}</math></p> <p>(4) G: Halogen Free, L: Lead Free, Blank: Pb/Sn</p> <p>(5) XL: <math>V_{DRM}</math>: 400V, ML: <math>V_{DRM}</math>: 300V</p> |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**■ MARKING**

(SOT-23)

## ■ ABSOLUTE MAXIMUM RATINGS (Ta= 25°C, unless otherwise specified)

| PARAMETER                                                                                | SYMBOL              | RATINGS    | UNIT |
|------------------------------------------------------------------------------------------|---------------------|------------|------|
| Repetitive Peak Off-State Voltage<br>(T <sub>J</sub> =40 ~ 125°C, R <sub>GK</sub> =1kΩ ) | V <sub>DRM</sub>    | 400        | V    |
|                                                                                          |                     | 300        |      |
| On-State Current (Tc=40°C)                                                               | I <sub>T(RMS)</sub> | 0.8        | A    |
| Average On-State Current (Half Cycle=180,Tc=40°C)                                        | I <sub>T(AV)</sub>  | 0.5        | A    |
| Peak Reverse Gate Voltage (IGR=10μA)                                                     | V <sub>GRM</sub>    | 1          | V    |
| Peak Gate Current (10μs Max.)                                                            | I <sub>GM</sub>     | 0.1        | A    |
| Gate Dissipation (20ms Max.)                                                             | P <sub>G(AV)</sub>  | 150        | mW   |
| Junction Temperature                                                                     | T <sub>J</sub>      | +125       | °C   |
| Storage Temperature                                                                      | T <sub>STG</sub>    | -40 ~ +150 | °C   |

Note 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. The device is guaranteed to meet performance specification within 0°C~70°C operating temperature range and assured by design from -20°C ~85°C.

## ■ ELECTRICAL CHARACTERISTICS (Ta= 25°C, unless otherwise specified.)

| PARAMETER                     | SYMBOL             | TEST CONDITIONS                                                                                                       | MIN | TYP | MAX  | UNIT |
|-------------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------|-----|-----|------|------|
| Off State Leakage Current     | I <sub>DRM</sub>   | V <sub>DRM</sub> (R <sub>GK</sub> =1KΩ), T <sub>J</sub> =125°C                                                        |     |     | 0.1  | mA   |
| Off State Leakage Current     | I <sub>DRM</sub>   | V <sub>DRM</sub> (R <sub>GK</sub> =1KΩ), T <sub>J</sub> =25°C                                                         |     |     | 1.0  | μA   |
| On State Voltage              | V <sub>T</sub>     | AT I <sub>T</sub> =0.4A                                                                                               |     |     | 1.4  | V    |
|                               |                    | AT I <sub>T</sub> =0.8A                                                                                               |     |     | 2.2  |      |
| On State Threshold Voltage    | V <sub>T(TO)</sub> | T <sub>J</sub> =125°C                                                                                                 |     |     | 0.95 | V    |
| On State Slops Resistance     | R <sub>t</sub>     | T <sub>J</sub> =125°C                                                                                                 |     |     | 600  | m    |
| Gate Trigger Current          | I <sub>GT</sub>    | V <sub>D</sub> =7V                                                                                                    |     |     | 200  | μA   |
| Gate Trigger Voltage          | V <sub>GT</sub>    | V <sub>D</sub> =7V                                                                                                    |     |     | 0.8  | V    |
| Holding Current               | I <sub>H</sub>     | R <sub>GK</sub> =1KΩ                                                                                                  |     |     | 5    | mA   |
| Latching Current              | I <sub>L</sub>     | R <sub>GK</sub> =1KΩ                                                                                                  |     |     | 6    | mA   |
| Critical Rate of Voltage Rise | DV/DT              | V <sub>D</sub> =0.67*V <sub>DRM</sub> (R <sub>GK</sub> =1KΩ),T <sub>J</sub> =125°C                                    |     |     |      | V/μs |
| Critical Rate of Current Rise | DV/DT              | I <sub>G</sub> =10mA, dI <sub>G</sub> /dt=0.1A/μs,T <sub>J</sub> =125°C                                               |     |     |      | A/μs |
| Gate Controlled Delay Time    | T <sub>GD</sub>    | I <sub>G</sub> =10mA, dI <sub>G</sub> /dt=0.1A/μs                                                                     |     |     | 2.2  | μs   |
| Commutated Turn-off Time      | T <sub>G</sub>     | T <sub>J</sub> =85°C, V <sub>D</sub> =0.67*V <sub>DRM</sub> , V <sub>R</sub> =35V, I <sub>T</sub> =I <sub>T(AV)</sub> |     |     | 200  | μs   |

## ■ CLASSIFICATION OF I<sub>GT</sub>

| RANK  | B      | C       | AA   | AB    | AC    | AD    |
|-------|--------|---------|------|-------|-------|-------|
| RANGE | 50-100 | 100-200 | 8-15 | 15-20 | 20-25 | 25-50 |

## ■ TYPICAL CHARACTERISTICS

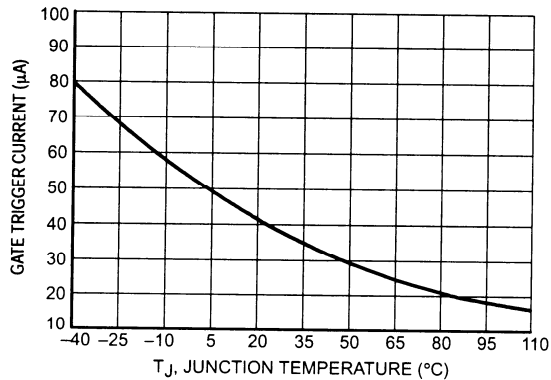


Figure 1. Typical Gate Trigger Current versus Junction Temperature

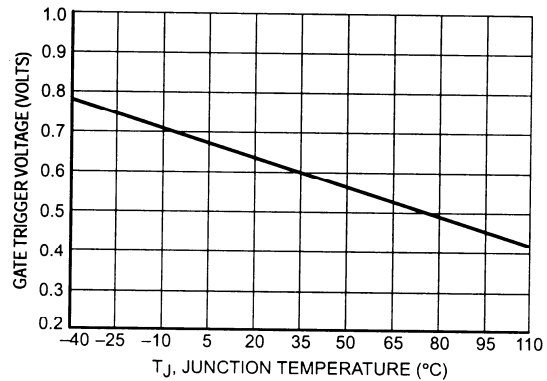


Figure 2. Typical Gate Trigger Voltage versus Junction Temperature

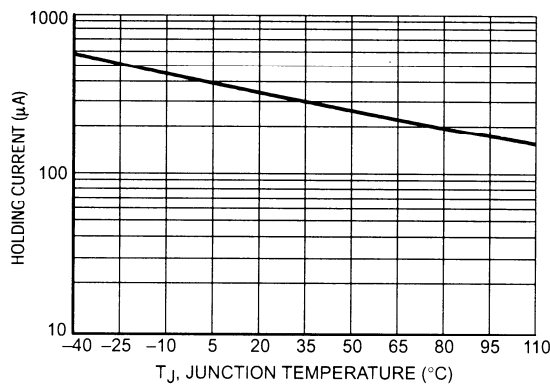


Figure 3. Typical Holding Current versus Junction Temperature

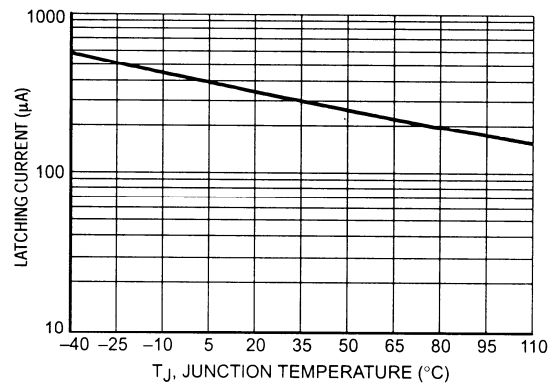


Figure 4. Typical Latching Current versus Junction Temperature

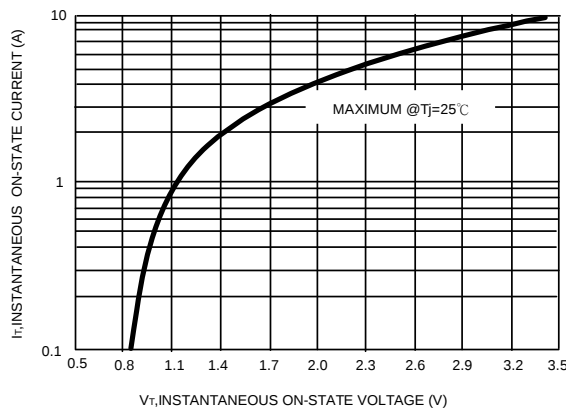


Figure 5. Typical On-State Characteristics

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