



Micro Commercial Components



Micro Commercial Components  
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# US1AFL THRU US1MFL

## 1 Amp Ultra Fast Rectifier 50 to 1000 Volts

### Features

- Halogen free available upon request by adding suffix "-HF"
- Lead Free Finish/RoHS Compliant(Note 1) ("P" Suffix designates RoHS Compliant. See ordering information)
- Glass Passivated Chip
- Ultra Fast Switching For High Efficiency
- For Surface Mounted Applications
- Low Forward Voltage Drop And High Current Capability
- Low Reverse Leakage Current
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1

### Maximum Ratings

- Operating Temperature: -65°C to +175°C
- Storage Temperature: -65°C to +175°C
- Maximum Thermal Resistance; 30°C/W Junction To Lead

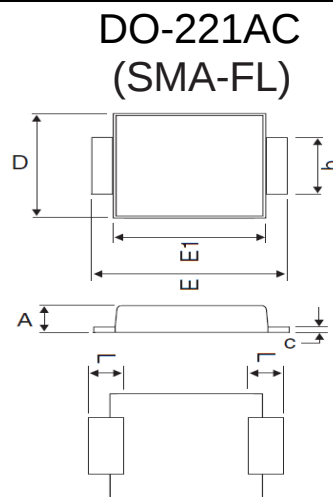
| MCC Catalog Number | Device Marking | Maximum Recurrent Peak Reverse Voltage | Maximum RMS Voltage | Maximum DC Blocking Voltage |
|--------------------|----------------|----------------------------------------|---------------------|-----------------------------|
| US1AFL             | US1A           | 50V                                    | 35V                 | 50V                         |
| US1BFL             | US1B           | 100V                                   | 70V                 | 100V                        |
| US1CFL             | US1C           | 150V                                   | 105V                | 150V                        |
| US1DFL             | US1D           | 200V                                   | 140V                | 200V                        |
| US1GFL             | US1G           | 400V                                   | 280V                | 400V                        |
| US1JFL             | US1J           | 600V                                   | 420V                | 600V                        |
| US1KFL             | US1K           | 800V                                   | 560V                | 800V                        |
| US1MFL             | US1M           | 1000V                                  | 700V                | 1000V                       |

### Electrical Characteristics @ 25°C Unless Otherwise Specified

|                                                                               |             |                       |                                                       |
|-------------------------------------------------------------------------------|-------------|-----------------------|-------------------------------------------------------|
| Average Forward Current                                                       | $I_{F(AV)}$ | 1.0A                  | $T_L = 110^\circ\text{C}$                             |
| Peak Forward Surge Current                                                    | $I_{FSM}$   | 30A                   | 8.3ms, half sine                                      |
| Maximum Instantaneous Forward Voltage<br>US1AFL-1DFL<br>US1GFL<br>US1JFL-1MFL | $V_F$       | 1.0V<br>1.4V<br>1.7V  | $I_{FM} = 1.0A$ ;<br>$T_J = 25^\circ\text{C}$         |
| Maximum DC Reverse Current At Rated DC Blocking Voltage                       | $I_R$       | 10uA<br>100uA         | $T_A = 25^\circ\text{C}$<br>$T_A = 100^\circ\text{C}$ |
| Maximum Reverse Recovery Time<br>US1AFL-US1GFL<br>US1JFL-US1KFL<br>US1MFL     | $T_{rr}$    | 50ns<br>75ns<br>100ns | $I_F = 0.5A$ , $I_R = 1.0A$ ,<br>$I_{rr} = 0.25A$     |
| Typical Junction Capacitance<br>US1AFL-1GFL<br>US1JFL-1MFL                    | $C_J$       | 20pF<br>17pF          | Measured at<br>1.0MHz, $V_R = 4.0V$                   |

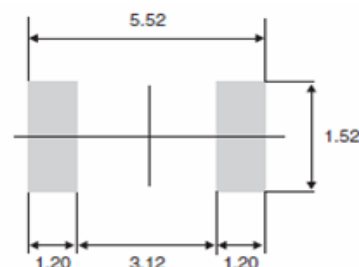
\*Pulse test: Pulse width 300 sec, Duty cycle 1%

Notes: 1. High Temperature Solder Exemption Applied, see EU Directive Annex Notes 7.



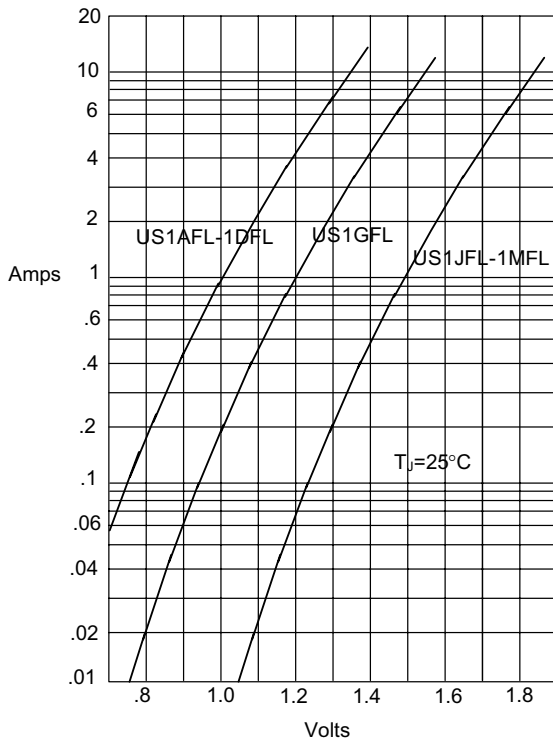
| DIM | INCHES |      | MM   |      | NOTE |
|-----|--------|------|------|------|------|
|     | MIN    | MAX  | MIN  | MAX  |      |
| A   | .035   | .043 | 0.90 | 1.10 |      |
| b   | .049   | .065 | 1.25 | 1.65 |      |
| C   | .004   | .016 | 0.10 | 0.40 |      |
| D   | .089   | .116 | 2.25 | 2.95 |      |
| E   | .188   | .220 | 4.80 | 5.60 |      |
| E1  | .156   | .181 | 3.95 | 4.60 |      |
| L   | .028   | .059 | 0.70 | 1.50 |      |

#### SUGGESTED SOLDER PAD LAYOUT



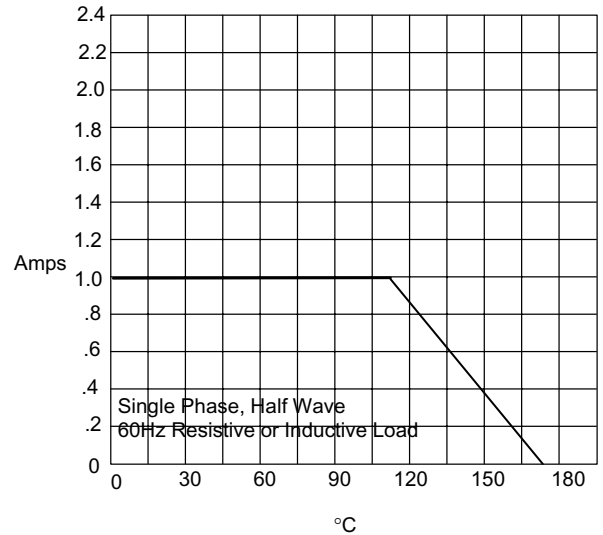
# US1AFL thru US1MFL

Figure 1  
Typical Forward Characteristics



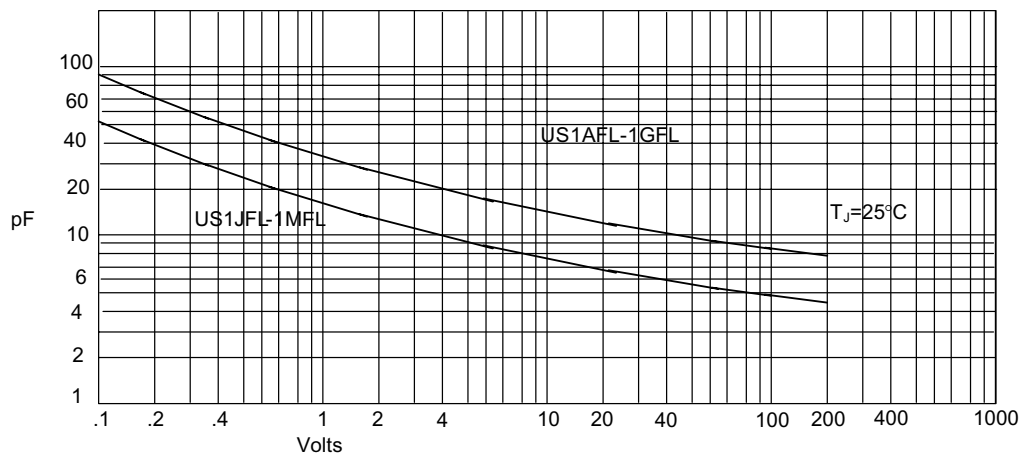
Instantaneous Forward Current - Amperes versus  
Instantaneous Forward Voltage - Volts

Figure 2  
Forward Derating Curve



Average Forward Rectified Current - Amperes versus  
Lead Temperature -  $^\circ\text{C}$

Figure 3  
Junction Capacitance

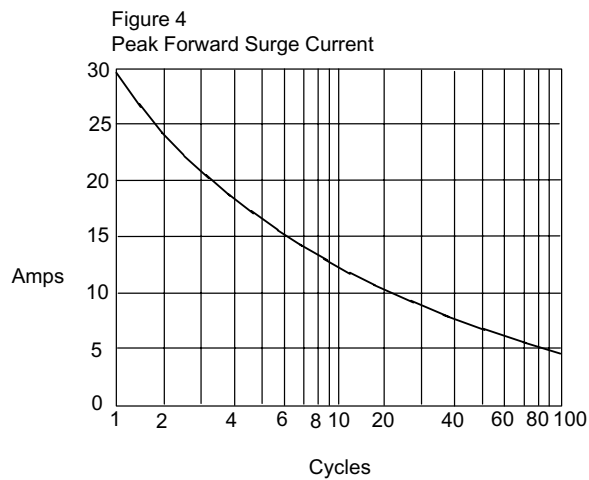


Junction Capacitance - pF versus  
Reverse Voltage - Volts

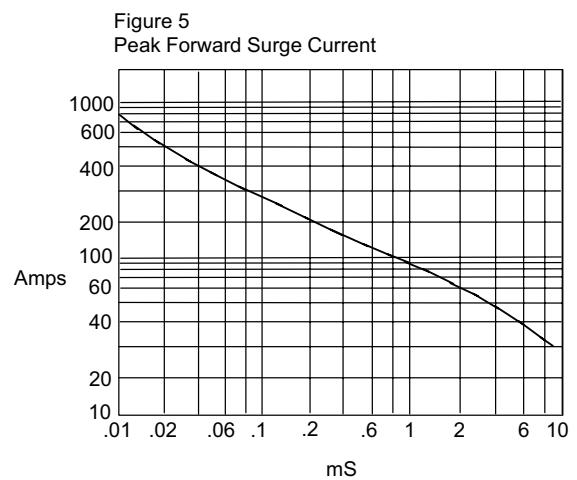
# US1AFL thru US1MFL



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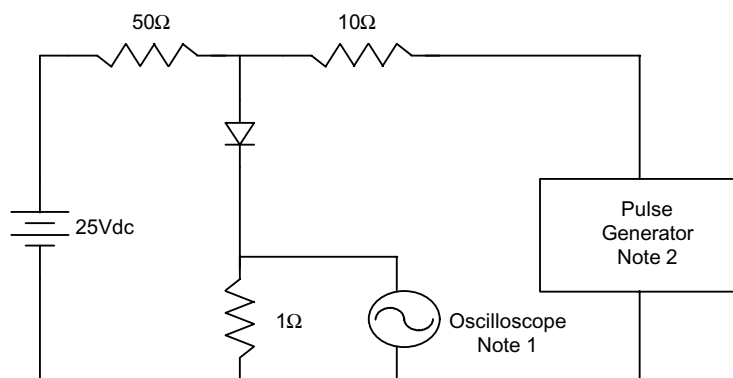


Peak Forward Surge Current - Amperes *versus*  
Number Of Cycles At 60Hz - Cycles

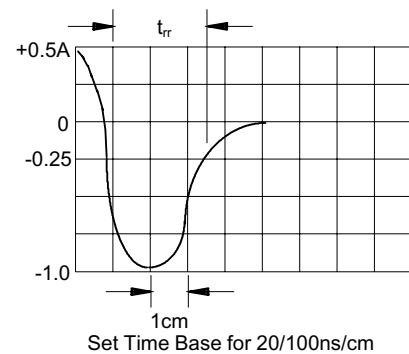


Peak Forward Surge Current - Amperes *versus*  
Pulse Duration - Milliseconds (mS)

Figure 6  
Reverse Recovery Time Characteristic And Test Circuit Diagram



- Notes:
1. Rise Time = 7ns max.  
Input impedance = 1 megohm, 22pF
  2. Rise Time = 10ns max.  
Source impedance = 50 ohms
  3. Resistors are non-inductive



## Ordering Information :

| Device         | Packing               |
|----------------|-----------------------|
| Part Number-TP | Tape&Reel: 5Kpcs/Reel |

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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