



## 3 Amp SQ-MELF Schottky Barrier Rectifiers

Qualified per MIL-PRF-19500/620

Qualified Levels\*:  
JAN, JANTX,  
JANTXV and JANS

### DESCRIPTION

This series of 3 amp Schottky rectifiers are compact in their square MELF packaging for high density mounting. The 1N5822US and 1N6864US are military qualified for high-reliability applications.

**Important:** For the latest information, visit our website <http://www.microsemi.com>.

### FEATURES

- JEDEC registered surface mount equivalents of 1N5820 – 1N5822 and 1N6864 numbers.
- Hermetically sealed.
- Metallurgically bonded.
- Double plug construction.
- \*JAN, JANTX, JANTXV and JANS qualifications are available per MIL-PRF-19500/620 for 1N6822US and 1N6864US only.  
(See [Part Nomenclature](#) for all available options.)
- RoHS compliant devices available (commercial grade only on the 1N6822US and 1N6864US).

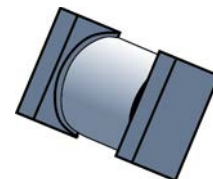
### APPLICATIONS / BENEFITS

- Small size for high density mounting (see package illustration).
- Non-sensitive to ESD per MIL-STD-750 method 1020.

### MAXIMUM RATINGS @ $T_A = +25^\circ\text{C}$ unless otherwise noted.

Parameters/Test Conditions	Symbol	Value	Unit
Junction Temperature	$T_J$	-65 to +125	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-65 to +150	$^\circ\text{C}$
Thermal Resistance Junction-to-End Cap	$R_{\theta JEC}$	10	$^\circ\text{C/W}$
Surge Peak Forward Current @ $T_A = +25^\circ\text{C}$ (Test pulse = 8.3 ms, half-sine wave.)	$I_{FSM}$	80	A (pk)
Average Rectified Output Current @ $T_{EC} = +55^\circ\text{C}$ <sup>(1)</sup>	$I_O$	3	A

**NOTES:** 1. See [Figures 3 and 4](#) for derating curves and for effects of  $V_R$  on  $T_J$ . The maximum  $T_J$  depends on the voltage applied.



**“B” SQ-MELF  
(D-5B) Package**

Also available in:



**“B” Package**

(axial-leaded)

[1N5820 – 1N5822, 1N6864](#)

#### MSC – Lawrence

6 Lake Street,  
Lawrence, MA 01841  
1-800-446-1158  
Tel: (978) 620-2600  
Fax: (978) 689-0803

#### MSC – Ireland

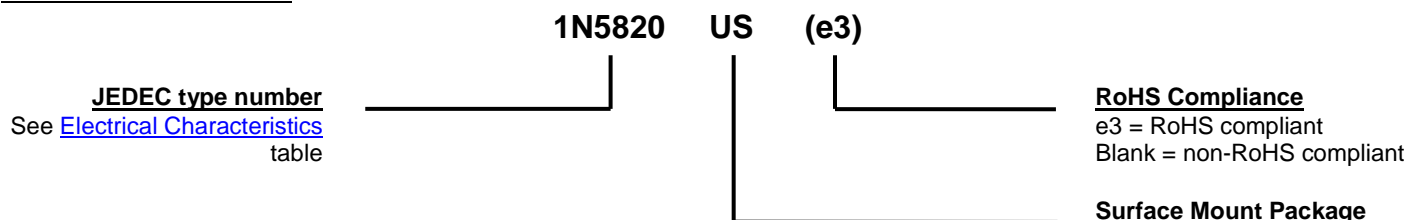
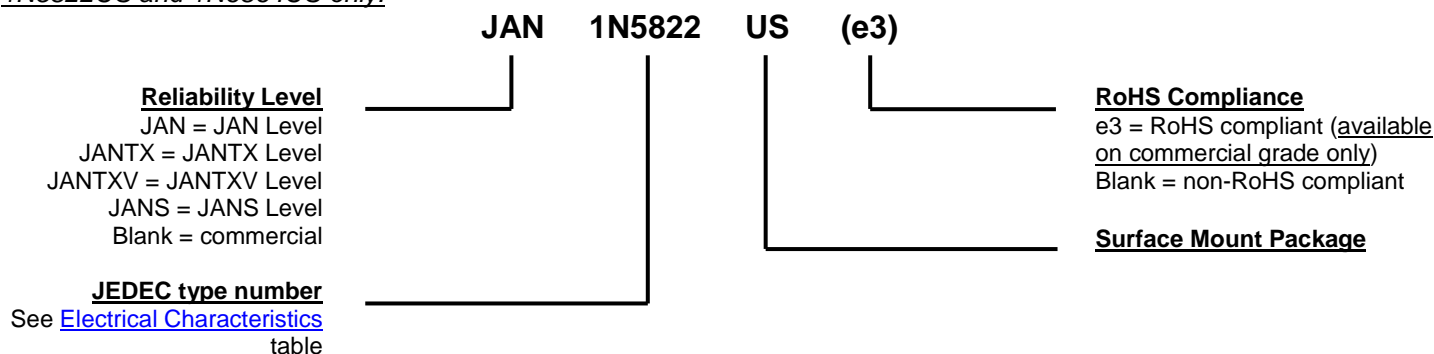
Gort Road Business Park,  
Ennis, Co. Clare, Ireland  
Tel: +353 (0) 65 6840044  
Fax: +353 (0) 65 6822298

Website:

[www.microsemi.com](http://www.microsemi.com)

**MECHANICAL and PACKAGING**

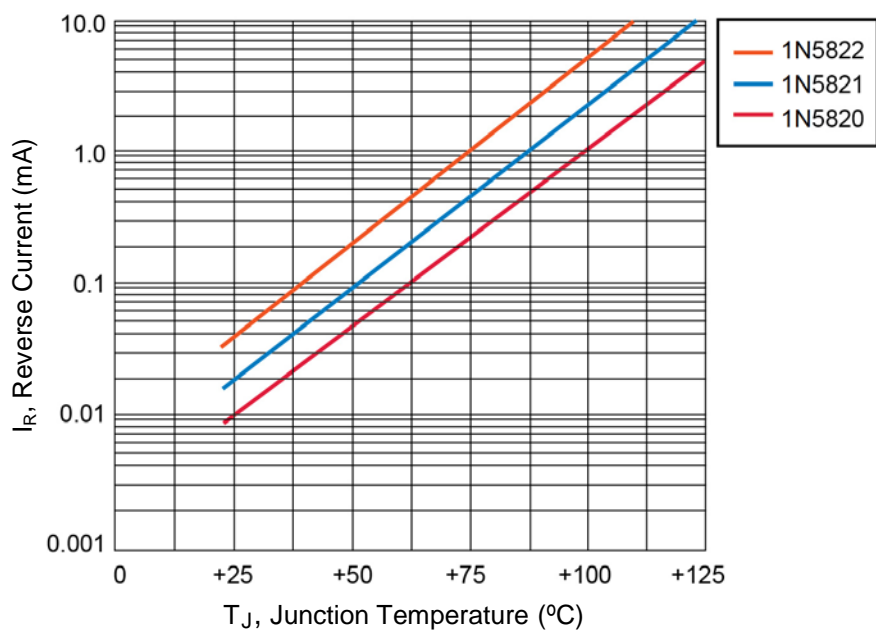
- CASE: Voidless hermetically sealed hard glass.
- TERMINALS: Tin-lead plate with >3% lead. Solder dip is available upon request. RoHS compliant matte-tin is available on commercial levels (no JAN levels).
- MARKING: Body painted and alpha numeric.
- POLARITY: Cathode indicated by band.
- Tape & Reel option: Standard per EIA-481-1-A with 12 mm tape. Consult factory for quantities.
- See [Package Dimensions](#) on last page.

**PART NOMENCLATURE**
1N5820US – 1N5821US

1N5822US and 1N6864US only:

**SYMBOLS & DEFINITIONS**

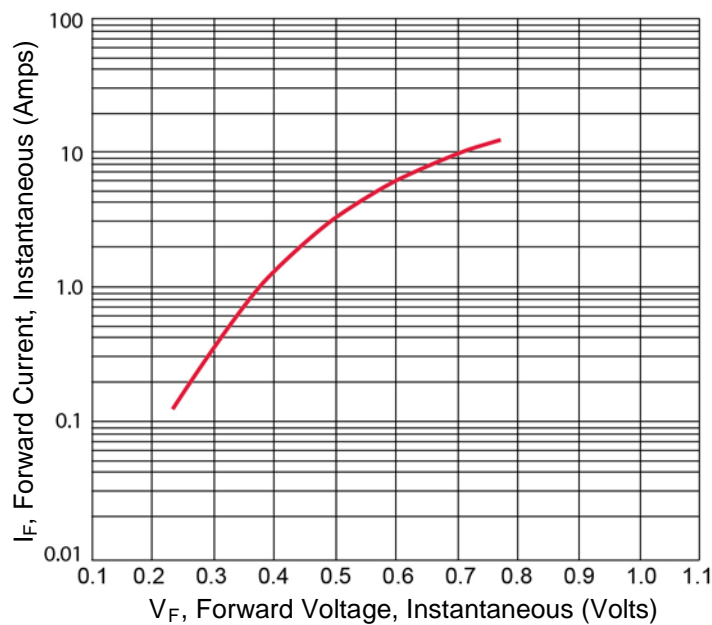
Symbol	Definition
C <sub>T</sub>	Capacitance: The capacitance in pF at a frequency of 1 MHz and specified voltage.
f	frequency
I <sub>R</sub>	Maximum Reverse Current: The maximum reverse (leakage) current that will flow at the specified voltage and temperature.
I <sub>O</sub>	Average Rectified Output Current: The output current averaged over a full cycle with a 50 Hz or 60 Hz sine-wave input and a 180 degree conduction angle.
V <sub>F</sub>	Maximum Forward Voltage: The maximum forward voltage the device will exhibit at a specified current.
V <sub>R</sub>	Reverse Voltage: The dc voltage applied in the reverse direction below the breakdown region.
V <sub>RWM</sub>	Working Peak Reverse Voltage: The maximum peak voltage that can be applied over the operating temperature range.

**ELECTRICAL CHARACTERISTICS @ 25 °C unless otherwise noted.**

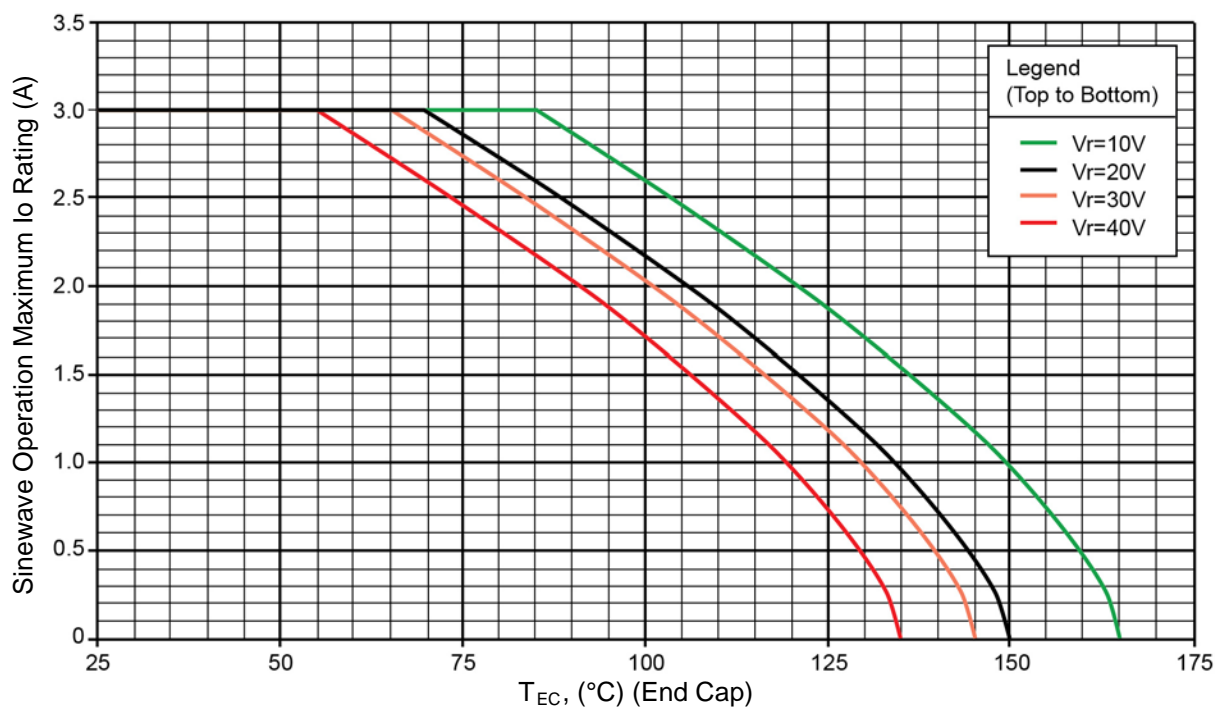
TYPE NUMBER	WORKING PEAK REVERSE VOLTAGE	MAXIMUM FORWARD VOLTAGE $V_{FM1}$	MAXIMUM FORWARD VOLTAGE $V_{FM2}$	MAXIMUM FORWARD VOLTAGE $V_{FM3}$	MAXIMUM REVERSE LEAKAGE CURRENT $I_{RM}$ @ $V_{RM}$	
	$V_{RWM}$	$I_{FM} = 1.0$ A	$I_{FM} = 3.0$ A	$I_{FM} = 9.4$ A	$T_J = +25$ °C	$T_J = +100$ °C
	V (pk)	Volts	Volts	Volts	mA	mA
1N5820US	20	0.40	0.50	0.70	0.10 @ 20 V	12.5 @ 20 V
1N5821US	30	0.40	0.50	0.70	0.10 @ 30 V	12.5 @ 30 V
1N5822US	40	0.40	0.50	0.70	0.10 @ 40 V	12.5 @ 40 V
1N6864US	80	0.50	0.70	N/A	0.15 @ 80 V	18.0 @ 80 V

**GRAPHS**

**FIGURE 1**

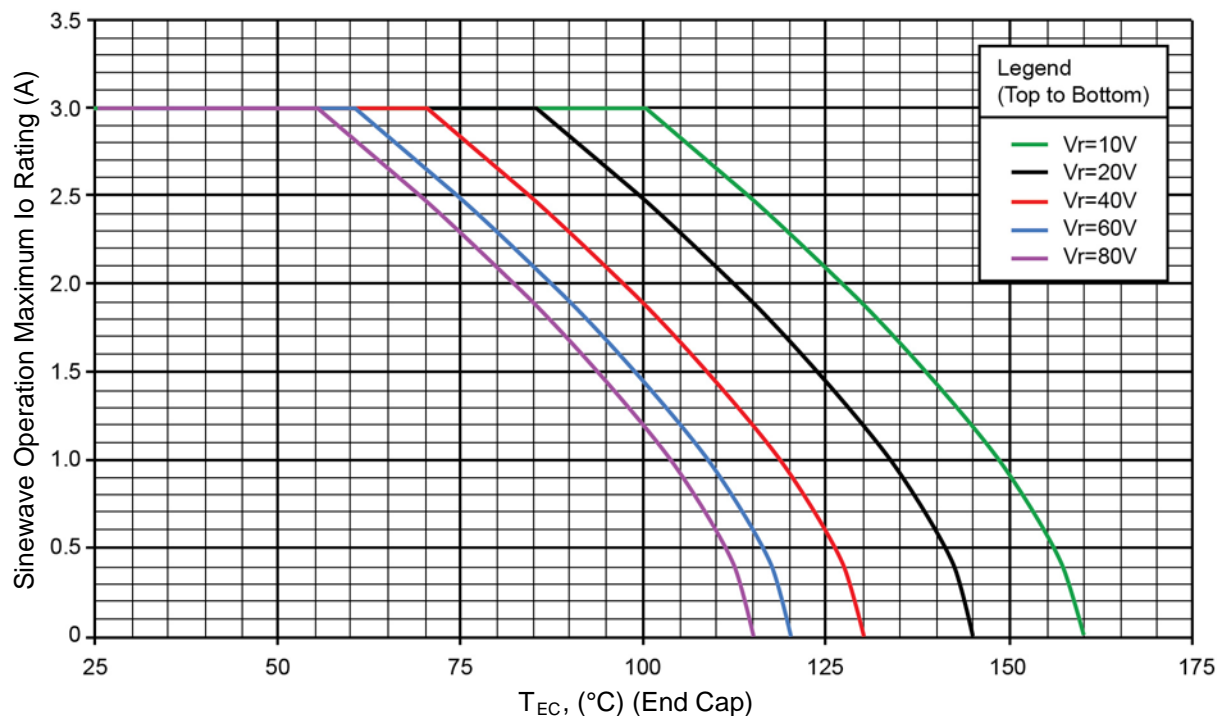
Typical Reverse Leakage Current at Rated PIV (PULSED)


**FIGURE 2**

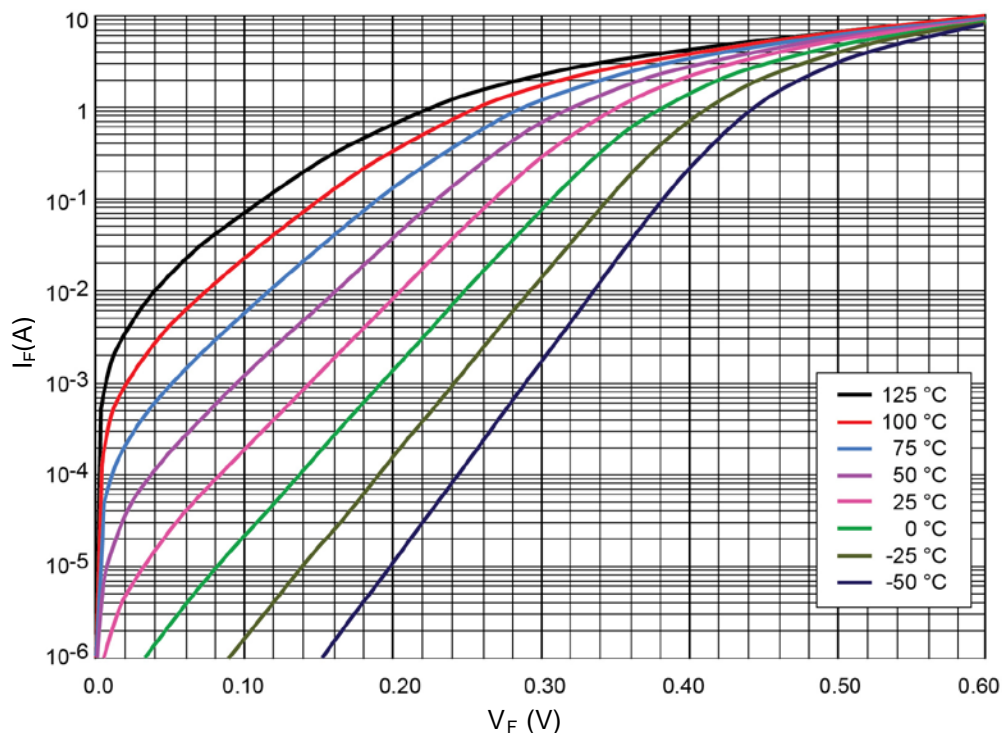
Typical Forward Voltage

**GRAPHS (continued)**


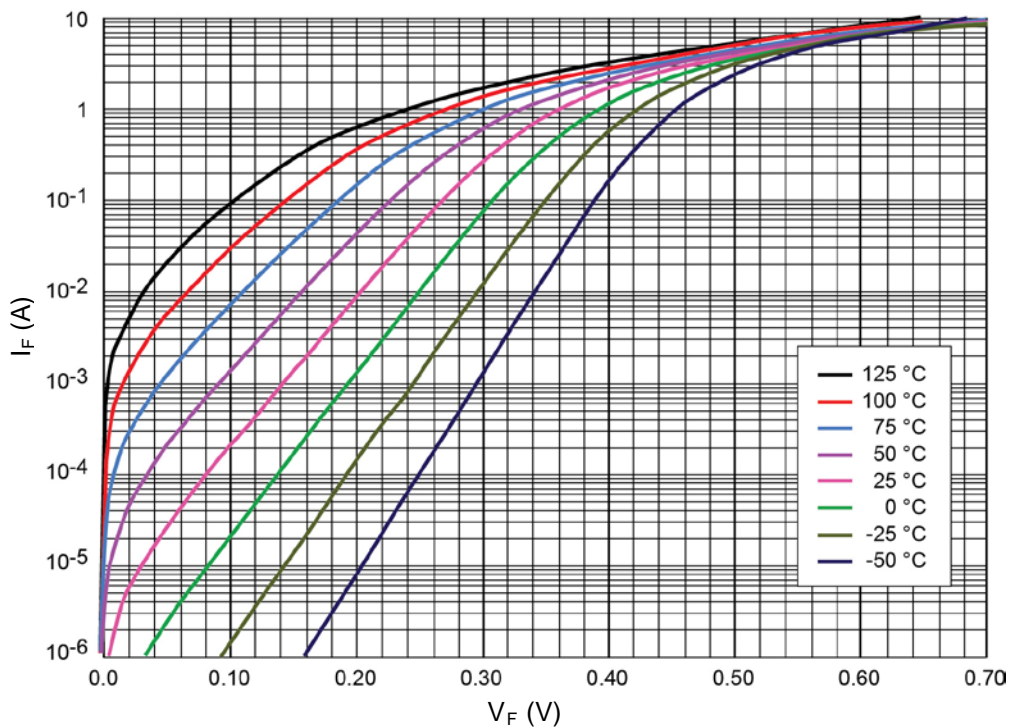
**FIGURE 3**  
Temperature Current Derating For 1N5822US



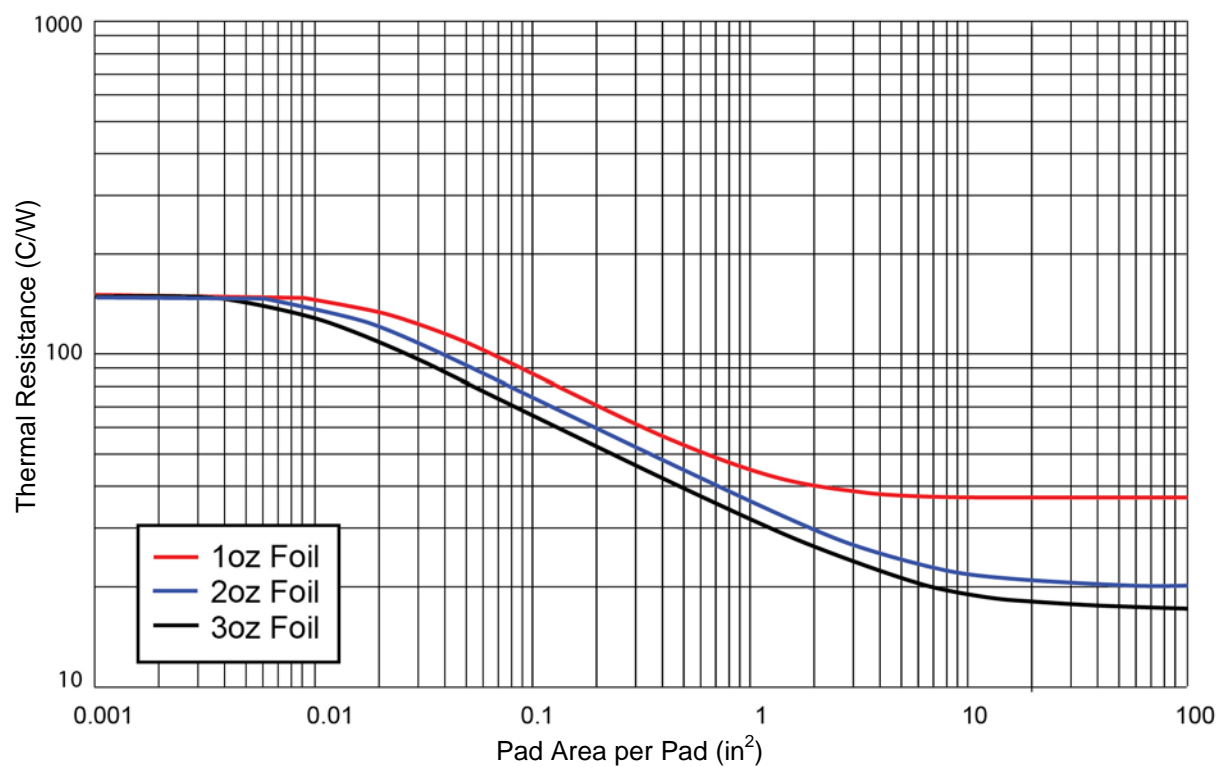
**FIGURE 4**  
Temperature Current Derating For 1N6864US

**GRAPHS (continued)**

**FIGURE 5**

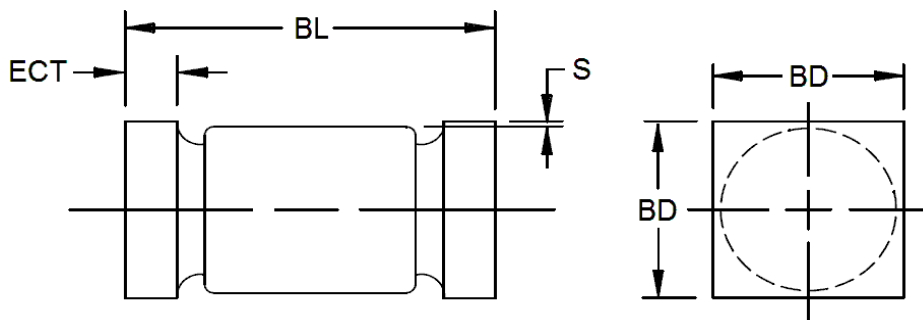
Schottky  $V_F - I_F$  Characteristics (Typical 1N5822US)


**FIGURE 6**

Schottky  $V_F - I_F$  Characteristics (Typical 1N6864US)

**GRAPHS (continued)**


**FIGURE 7**  
Thermal Resistance vs FR4 Pad Area Still Air with the PCB horizontal

**PACKAGE DIMENSIONS**


DIM	INCH		MILLIMETERS	
	MIN	MAX	MIN	MAX
<b>BD</b>	0.137	0.148	3.48	3.76
<b>ECT</b>	0.019	0.028	0.48	0.71
<b>BL</b>	0.200	0.225	5.08	5.72
<b>S</b>	0.003 MIN.		0.08 MIN.	

**NOTES:**

1. Dimensions are in inches. Millimeters are given for information only.
2. Dimensions are pre-solder dip.
3. U-suffix parts are structurally identical to the US-suffix parts.
4. In accordance with ASME Y14.5M, diameters are equivalent to  $\Phi$ x symbology.