Microsemi
SCOTTSDALE DIVISION

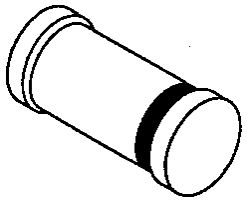
1N4678UR thru 1N4717UR
(or MLL4678 thru MLL4717)

GLASS SURFACE MOUNT 0.5 WATT ZENERS

DESCRIPTION

The 1N4678UR thru 1N4717UR series of 0.5 watt glass surface mount DO-213AA Zener voltage regulators provides selection from 1.8 to 43 volts in standard 5% tolerances as well as tighter tolerances at a very low test current of 50 µA. These are also available with an internal-metallurgical-bond option by adding a "-1" suffix (see separate data sheet) including military upgrade screening options. Microsemi also offers numerous other Zener products to meet higher and lower power applications.

APPEARANCE



DO-213AA

IMPORTANT: For the most current data, consult *MICROSEMI's* website: http://www.microsemi.com

FEATURES

- Surface mount equivalent to JEDEC registered 1N4678 thru 1N4717 series
- Internal metallurgical bond option available by adding a "-1" suffix (see separate data sheet for same part numbers with "-1" suffix)
- DO-7 or DO-35 glass body axial-leaded Zener equivalents also available per JEDEC registration (see separate data sheet for part numbers 1N4678 thru 1N4717 series

APPLICATIONS / BENEFITS

- Regulates voltage over a broad operating current and temperature range
- Extensive selection from 1.8 to 43 V
- Standard voltage tolerances are plus/minus 5% with no suffix
- Tight tolerances available in plus or minus 2% or 1% with additional C or D suffix respectively
- Hermetically sealed surface mount package
- Nonsensitive to ESD per MIL-STD-750 Method 1020
- Minimal capacitance (see Figure 3)
- Inherently radiation hard as described in Microsemi MicroNote 050

MAXIMUM RATINGS

- Operating and Storage temperature: -65°C to +175°C
- Thermal Resistance: 150°C/W junction to end cap and 300°C/W junction to ambient when mounted on FR4 PC board (1 oz Cu) with recommended footprint (see last page Figure 1)
- Steady-State Power: 0.5 watts at end cap temperature $T_{EC} \leq 100^{o}C$ or ambient temperature $T_A \leq 25^{o}C$ when mounted on FR4 PC board as described for thermal resistance above (see Figure 2 for derating)
- Forward voltage @100 mA: 1.5 volts (max)
- Solder Temperatures: 260°C for 10 s (max)

MECHANICAL AND PACKAGING

- CASE: Hermetically sealed glass DO-213AA (SOD80 or MLL34) MELF style package
- TERMINALS: End caps tin-lead plated solderable per MIL-STD-750, method 2026
- POLARITY: Cathode indicated by band where diode is to be operated with the banded end positive with respect to the opposite end for Zener regulation
- MARKING: cathode band only
- TAPE & REEL option: Standard per EIA-481-1-B with 12 mm tape, 2000 per 7 inch reel or 5000 per 13 inch reel (add "TR" suffix to part number)
- WEIGHT: 0.04 grams
- See package dimensions on last page

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*ELECTRICAL CHARACTERISTICS @ 25°C

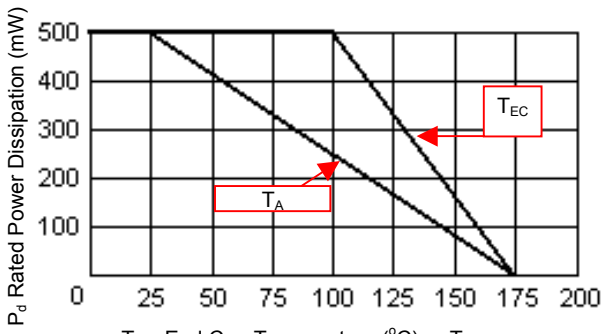
INDUSTRY PART NUMBER (Note 1)	MICROSEMI PART NUMBER (Note 1)	NOMINAL ZENER VOLTAGE (Note 2) V_Z VOLTS	ZENER TEST CURRENT I_{ZT} µA	MAXIMUM VOLTAGE REGULATION (Note 3) ΔV_Z VOLTS	MAXIMUM REVERSE LEAKAGE CURRENT I_R @ V_R µA	VOLTS	MAXIMUM DC ZENER CURRENT* I_{ZM} mA
1N4678UR	MLL4678	1.8	50	0.70	7.5	1.0	240
1N4679UR	MLL4679	2.0	50	0.70	5.0	1.0	220
1N4680UR	MLL4680	2.2	50	0.75	4.0	1.0	200
1N4681UR	MLL4681	2.4	50	0.80	2.0	1.0	190
1N4682UR	MLL4682	2.7	50	0.85	1.0	1.0	180
1N4683UR	MLL4683	3.0	50	0.90	0.8	1.0	170
1N4684UR	MLL4684	3.3	50	0.95	7.5	1.5	160
1N4685UR	MLL4685	3.6	50	0.95	7.5	2.0	150
1N4686UR	MLL4686	3.9	50	0.97	5.0	2.0	140
1N4687UR	MLL4687	4.3	50	0.99	4.0	2.0	130
1N4688UR	MLL4688	4.7	50	0.99	10.0	3.0	120
1N4689UR	MLL4689	5.1	50	0.97	10.0	3.0	110
1N4690UR	MLL4690	5.6	50	0.96	10.0	4.0	100
1N4691UR	MLL4691	6.2	50	0.95	10.0	5.0	90
1N4692UR	MLL4692	6.8	50	0.90	10.0	5.1	70
1N4693UR	MLL4693	7.5	50	0.75	10.0	5.7	63.6
1N4694UR	MLL4694	8.2	50	0.50	1.0	6.2	58.0
1N4695UR	MLL4695	8.7	50	0.10	1.0	6.6	54.8
1N4696UR	MLL4696	9.1	50	0.08	1.0	6.9	52.4
1N4697UR	MLL4697	10.0	50	0.10	1.0	7.6	49.6
1N4698UR	MLL4698	11.0	50	0.11	0.05	8.4	43.2
1N4699UR	MLL4699	12.0	50	0.12	0.05	9.1	40.8
1N4700UR	MLL4700	13.0	50	0.13	0.05	9.8	38.0
1N4701UR	MLL4701	14.0	50	0.14	0.05	10.6	35.0
1N4702UR	MLL4702	15.0	50	0.15	0.05	11.4	32.6
1N4703UR	MLL4703	16.0	50	0.16	0.05	12.1	30.8
1N4704UR	MLL4704	17.0	50	0.17	0.05	12.9	29.0
1N4705UR	MLL4705	18.0	50	0.18	0.05	13.6	26.4
1N4706UR	MLL4706	19.0	50	0.19	0.05	14.4	25.0
1N4707UR	MLL4707	20.0	50	0.20	0.01	15.2	23.8
1N4708UR	MLL4708	22.0	50	0.22	0.01	16.7	21.6
1N4709UR	MLL4709	24.0	50	0.24	0.01	18.2	19.8
1N4710UR	MLL4710	25.0	50	0.25	0.01	19.0	19.0
1N4711UR	MLL4711	27.0	50	0.27	0.01	20.4	17.6
1N4712UR	MLL4712	28.0	50	0.28	0.01	21.2	17.0
1N4713UR	MLL4713	30.0	50	0.30	0.01	22.8	15.8
1N4714UR	MLL4714	33.0	50	0.33	0.01	25.0	14.4
1N4715UR	MLL4715	36.0	50	0.36	0.01	27.3	13.2
1N4716UR	MLL4716	39.0	50	0.39	0.01	29.6	12.2
1N4717UR	MLL4717	43.0	50	0.43	0.01	32.6	11.0

*JEDEC registered data except I_{ZM} has been increased (doubled) for 500 mW power dissipation capabilities

NOTES: 1. These may be ordered as either 1N4678UR through 1N4717UR, or as the MLL4678 through MLL4717.
2. All types as shown are +/-5% tolerance. Also available in 2% and 1% tolerance with added suffix C and D respectively.
3. ΔV_Z @ 100µA minus V_Z @ 10µA.

The electrical characteristics are measured after allowing the device to stabilize for 20 seconds when mounted with 3/8" minimum lead length from the base.

GRAPHS



T_{EC}, End Cap Temperature (°C) or T_A
Ambient temperature on FR4 PC board

FIGURE 1 Power Derating Curve

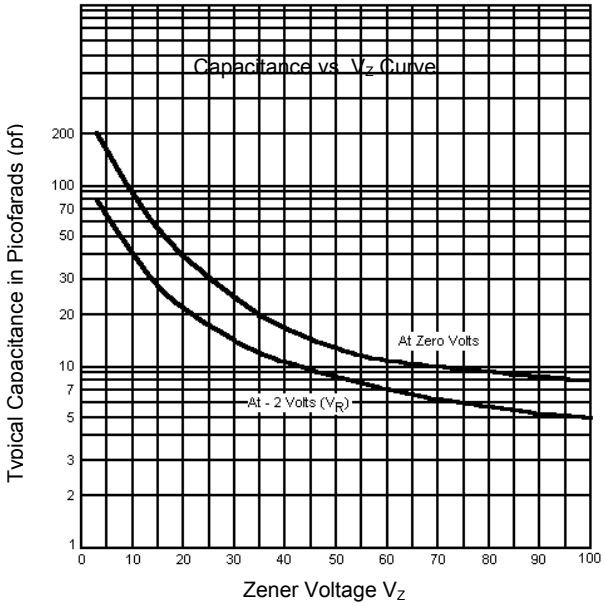
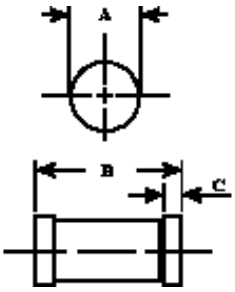
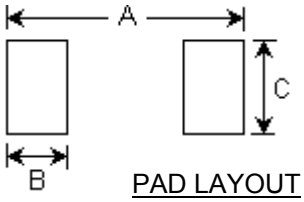


FIGURE 2 Capacitance vs. Zener Voltage (Typical)

PACKAGE DIMENSIONS



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.063	0.067	1.60	1.70
B	0.130	0.146	3.30	3.70
C	0.016	0.022	0.41	0.55



PAD LAYOUT

	INCHES	mm
A	.200	5.08
B	.055	1.40
C	.080	2.03