



**THE DATASHEET OF  
MAZ31600ML**



# MAZ3000 Series (MA3000 Series)

## Silicon planar type

For stabilization of power supply

### ■ Features

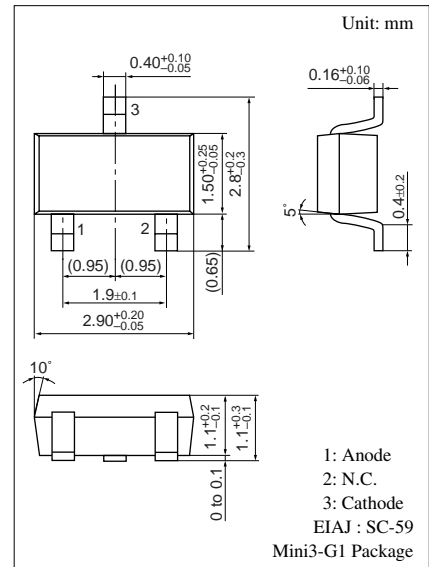
- Mini type 3-pin package (Mini3-G1)
- Allowing to achieve a high-density set
- Sharp rising performance
- Wide voltage range:  $V_Z = 2.0\text{ V}$  to  $36\text{ V}$

### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Average forward current	$I_{F(AV)}$	100	mA
Repetitive peak forward current	$I_{FRM}$	200	mA
Total power dissipation *1	$P_{tot}$	200	mW
Non-repetitive reverse surge power dissipation *2	$P_{ZSM}$	15	W
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

Note) \*1: With a printed circuit board

\*2:  $t = 100\ \mu\text{s}$ ,  $T_j = 150^\circ\text{C}$



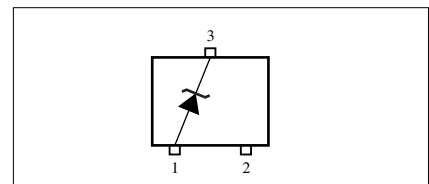
### Marking Symbol

Refer to the list of the electrical characteristics within part numbers

(Example) MAZ3020: 2.0  
MAZ30820H: 8.2H

Note) L/M/H marked products will be supplied unless other wise specified

### Internal Connection



### ■ Common Electrical Characteristics $T_a = 25^\circ\text{C}$ \*1

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Forward voltage	$V_F$	$I_F = 10\text{ mA}$		0.8	0.9	V
Zener voltage *2	$V_Z$	$I_Z$ Specified value				V
Zener knee operating resistance	$R_{ZK}$	$I_Z$ Specified value				$\Omega$
Zener operating resistance	$R_Z$	$I_Z$ Specified value				$\Omega$
Reverse current	$I_{R1}$	$V_R$ Specified value				$\mu\text{A}$
	$I_{R2}$	$V_R$ Specified value				$\mu\text{A}$
Temperature coefficient of zener voltage *3	$S_Z$	$I_Z$ Specified value				mV/ $^\circ\text{C}$
Terminal capacitance	$C_t$	$V_R$ Specified value				pF

Note) 1. Rated input/output frequency: 5 MHz

2. \*1 : The  $V_Z$  value is for the temperature of  $25^\circ\text{C}$ . In other cases, carry out the temperature compensation.

\*2: Guaranteed at 20 ms after power application.

\*3:  $T_j = 25^\circ\text{C}$  to  $150^\circ\text{C}$

Note) The part number in the parenthesis shows conventional part number.

■ Electrical characteristics within part numbers  $T_a = 25^\circ\text{C}$

•  $V_Z = 2.0\text{ V to } 8.2\text{ V}$  ( $I_Z = 5\text{ mA}$ )

Part number	Zener voltage			Reverse current				Zener operating resistance				Temperature coefficient of zener voltage			Terminal capacitance		Marking symbol
	$V_Z$ (V)			$I_{R1}$ ( $\mu\text{A}$ )		$I_{R2}$ ( $\mu\text{A}$ )		$R_Z$ ( $\Omega$ )		$R_{ZK}$ ( $\Omega$ )		$S_Z$ (mV/ $^\circ\text{C}$ )			$C_t$ (pF)		
	$I_Z = 5\text{ mA}$			$V_R$	Max	$V_R$	Max	$I_Z$	Max	$I_Z$	Max	$I_Z = 5\text{ mA}$			$(V_R = 0\text{ V})$ $f = 1\text{ MHz}$		
	Min	Nom	Max	(V)	Max	(V)	Max	Typ	Max	Typ	Max	Min	Typ	Max	Typ	Max	
MAZ3020	1.88	2.0	2.12	0.5	120	—	—	5	100	—	—	-3.5	-1.5	0	—	—	2.0
MAZ3022	2.08	2.2	2.32	0.7	120	—	—	5	100	—	—	-3.5	-1.5	0	—	—	2.2
MAZ3024	2.28	2.4	2.60	1	120	—	—	5	100	—	—	-3.5	-1.6	0	—	—	2.4
MAZ3027	2.50	2.7	2.90	—	—	—	—	—	—	—	—	—	—	—	—	—	2.7L or 2.7H
MAZ30270L	2.50	2.6	2.75	1	120	—	—	5	110	—	—	-3.5	-2.0	0	—	—	2.7L
MAZ30270H	2.65	2.8	2.90	—	—	—	—	—	—	—	—	—	—	—	—	—	2.7H
MAZ3030	2.80	3.0	3.20	—	—	—	—	—	—	—	—	—	—	—	—	—	3.0L or 3.0H
MAZ30300L	2.80	2.9	3.05	1	50	—	—	5	120	—	—	-3.5	-2.1	0	—	—	3.0L
MAZ30300H	2.95	3.1	3.20	—	—	—	—	—	—	—	—	—	—	—	—	—	3.0H
MAZ3033	3.10	3.3	3.50	—	—	—	—	—	—	—	—	—	—	—	—	—	3.3L or 3.3H
MAZ30330L	3.10	3.2	3.35	1	20	—	—	5	130	—	—	-3.5	-2.4	0	—	—	3.3L
MAZ30330H	3.25	3.4	3.50	—	—	—	—	—	—	—	—	—	—	—	—	—	3.3H
MAZ3036	3.40	3.6	3.80	—	—	—	—	—	—	—	—	—	—	—	—	—	3.6L or 3.6H
MAZ30360L	3.40	3.5	3.65	1	10	—	—	5	130	—	—	-3.5	-2.4	0	—	—	3.6L
MAZ30360H	3.55	3.7	3.80	—	—	—	—	—	—	—	—	—	—	—	—	—	3.6H
MAZ3039	3.70	3.9	4.10	—	—	—	—	—	—	—	—	—	—	—	—	—	3.9L or 3.9H
MAZ30390L	3.70	3.8	3.97	1	10	—	—	5	130	—	—	-3.5	-2.5	0	—	—	3.9L
MAZ30390H	3.87	4.0	4.10	—	—	—	—	—	—	—	—	—	—	—	—	—	3.9H
MAZ3043	4.00	4.3	4.60	—	—	—	—	—	—	—	—	—	—	—	—	—	4.3L or 4.3M or 4.3H
MAZ30430L	4.03	4.1	4.26	1	10	—	—	5	130	—	—	-3.5	-2.5	0	—	—	4.3L
MAZ30430M	4.17	4.3	4.40	—	—	—	—	—	—	—	—	—	—	—	—	—	4.3M
MAZ30430H	4.31	4.4	4.54	—	—	—	—	—	—	—	—	—	—	—	—	—	4.3H
MAZ3047	4.4	4.7	5.0	—	—	—	—	—	—	—	—	—	—	—	—	—	4.7L or 4.7M or 4.7H
MAZ30470L	4.45	4.6	4.69	1	3	—	—	50	80	1	900	-3.5	-1.4	0.2	130	180	4.7L
MAZ30470M	4.59	4.7	4.83	—	—	—	—	—	—	—	—	—	—	—	—	—	4.7M
MAZ30470H	4.74	4.9	4.99	—	—	—	—	—	—	—	—	—	—	—	—	—	4.7H
MAZ3051	4.8	5.1	5.4	—	—	—	—	—	—	—	—	—	—	—	—	—	5.1L or 5.1M or 5.1H
MAZ30510L	4.87	5.0	5.12	2	2	—	—	40	60	1	800	-2.7	-0.8	1.2	110	160	5.1L
MAZ30510M	5.0	5.1	5.26	—	—	—	—	—	—	—	—	—	—	—	—	—	5.1M
MAZ30510H	5.14	5.3	5.4	—	—	—	—	—	—	—	—	—	—	—	—	—	5.1H
MAZ3056	5.3	5.6	6.0	—	—	—	—	—	—	—	—	—	—	—	—	—	5.6L or 5.6M or 5.6H
MAZ30560L	5.3	5.4	5.58	2	1	—	—	15	40	1	500	-2	1.2	2.5	95	140	5.6L
MAZ30560M	5.48	5.6	5.76	—	—	—	—	—	—	—	—	—	—	—	—	—	5.6M
MAZ30560H	5.66	5.8	5.95	—	—	—	—	—	—	—	—	—	—	—	—	—	5.6H
MAZ3062	5.8	6.2	6.6	—	—	—	—	—	—	—	—	—	—	—	—	—	6.2L or 6.2M or 6.2H
MAZ30620L	5.85	6.0	6.15	4	3	5.3	60	6	20	0.5	300	0.4	2.3	3.7	90	130	6.2L
MAZ30620M	6.05	6.2	6.36	—	—	5.5	—	—	—	—	—	—	—	—	—	—	6.2M
MAZ30620H	6.24	6.4	6.56	—	—	5.7	—	—	—	—	—	—	—	—	—	—	6.2H
MAZ3068	6.4	6.8	7.2	—	—	—	—	—	—	—	—	—	—	—	—	—	6.8L or 6.8M or 6.8H
MAZ30680L	6.44	6.6	6.77	4	2	5.9	60	6	15	0.5	140	1.2	3	4.5	85	110	6.8L
MAZ30680M	6.64	6.8	6.98	—	—	6.1	—	—	—	—	—	—	—	—	—	—	6.8M
MAZ30680H	6.85	7.0	7.2	—	—	6.3	—	—	—	—	—	—	—	—	—	—	6.8H
MAZ3075	7.0	7.5	7.9	—	—	—	—	—	—	—	—	—	—	—	—	—	7.5L or 7.5M or 7.5H
MAZ30750L	7.07	7.3	7.43	5	1	6.5	60	6	15	0.5	120	2.5	4	5.3	80	100	7.5L
MAZ30750M	7.29	7.5	7.67	—	—	6.7	—	—	—	—	—	—	—	—	—	—	7.5M
MAZ30750H	7.51	7.7	7.89	—	—	7.0	—	—	—	—	—	—	—	—	—	—	7.5H
MAZ3082	7.7	8.2	8.7	—	—	—	—	—	—	—	—	—	—	—	—	—	8.2L or 8.2M or 8.2H
MAZ30820L	7.77	7.9	8.17	5	0.5	7.2	60	6	15	0.5	120	3.2	4.6	6.2	75	95	8.2L
MAZ30820M	8.03	8.2	8.43	—	—	7.5	—	—	—	—	—	—	—	—	—	—	8.2M
MAZ30820H	8.29	8.5	8.7	—	—	7.7	—	—	—	—	—	—	—	—	—	—	8.2H

■ Electrical characteristics within part numbers (continued)  $T_a = 25^\circ\text{C}$

•  $V_Z = 9.1\text{ V to }24.0\text{ V}$  ( $I_Z = 5\text{ mA}$ )

Part number	Zener voltage			Reverse current				Zener operating resistance				Temperature coefficient of zener voltage			Terminal capacitance		Marking symbol
	$V_Z$ (V)			$I_{R1}$ ( $\mu\text{A}$ )		$I_{R2}$ ( $\mu\text{A}$ )		$R_Z$ ( $\Omega$ )		$R_{ZK}$ ( $\Omega$ )		$S_Z$ (mV/ $^\circ\text{C}$ )			$C_t$ (pF)		
	$I_Z = 5\text{ mA}$			$V_R$ (V)		$V_R$ (V)		$I_Z = 5\text{ mA}$		$I_Z$ (mA)		$I_Z = 5\text{ mA}$			$(V_R = 0\text{ V})$ $f = 1\text{ MHz}$		
	Min	Nom	Max	Max	Max	Max	Max	Typ	Max	Typ	Max	Min	Typ	Max	Typ	Max	
MA3091	8.5	9.1	9.6	6	0.2	8	60	6	15	0.5	130	3.8	5.5	7	70	90	9.1L or 9.1M or 9.1H
MAZ30910L	8.58	8.8	9.02			8											9.1L
MAZ30910M	8.87	9.1	9.33			8.3											9.1M
MAZ30910H	9.14	9.4	9.6			8.6											9.1H
MAZ3100	9.4	10	10.6	7	0.2	8.9	60	8	20	0.5	130	4.5	6.4	8	70	90	10L or 10M or 10H
MAZ31000L	9.44	9.7	9.92			8.9											10L
MAZ31000M	9.75	10	10.25			9.2											10M
MAZ31000H	10.07	10.3	10.59			9.5											10H
MAZ3110	10.4	11	11.6	7	0.1	9.9	60	10	20	0.5	170	5.4	7.4	9	65	85	11L or 11M or 11H
MAZ31100L	10.4	10.7	10.94			9.9											11L
MAZ31100M	10.73	11	11.28			10.2											11M
MAZ31100H	11.05	11.3	11.6			10.5											11H
MAZ3120	11.4	12	12.7	8	0.1	10.9	60	10	25	0.5	170	6	8.4	10	65	85	12L or 12M or 12H
MAZ31200L	11.4	11.7	11.96			10.9											12L
MAZ31200M	11.73	12	12.33			11.2											12M
MAZ31200H	12.06	12.3	12.68			11.5											12H
MAZ3130	12.4	13	14.1	9	0.1	11.9	60	10	30	0.5	170	7	9.4	11	60	80	13L or 13M or 13H
MAZ31300L	12.4	12.7	12.99			11.9											13L
MAZ31300M	12.73	13	13.4			12.2											13M
MAZ31300H	13.25	13.7	14.08			12.7											13H
MAZ31400M	13.65	14	14.35	9	0.1	13.1	60	10	30	0.5	170	7	10	13	60	80	14M
MAZ3150	13.9	15	15.6	10	0.05	13.4	60	10	30	0.5	170	9.2	11.4	13	55	75	15L or 15M or 15H
MAZ31500L	13.9	14.3	14.76			13.4											15L
MAZ31500M	14.6	15	15.35			14.1											15M
MAZ31500H	14.95	15.3	15.6			14.4											15H
MAZ3160	15.3	16	17.1	11	0.05	14.8	60	10	40	0.5	170	10.4	12.4	14	52	75	16L or 16M or 16H
MAZ31600L	15.3	15.7	16.09			14.8											16L
MAZ31600M	15.7	16	16.5			15.2											16M
MAZ31600H	16.26	16.7	17.1			15.7											16H
MAZ3180	16.9	18	19.1	13	0.05	16.4	60	10	45	0.5	170	12.4	14.4	16	47	70	18L or 18M or 18H
MAZ31800L	16.9	17.3	17.76			16.4											18L
MAZ31800M	17.55	18	18.45			17											18M
MAZ31800H	18.2	18.7	19.1			17.7											18H
MAZ3200	18.8	20	21.2	14	0.05	18.3	60	15	55	0.5	180	14.4	16.4	18	36	60	20L or 20M or 20H
MAZ32000L	18.85	19.3	19.81			18.3											20L
MAZ32000M	19.50	20	20.5			19											20M
MAZ32000H	20.15	20.7	21.19			19.6											20H
MAZ3220	20.8	22	23.3	15	0.05	20.3	60	20	55	0.5	180	16.4	18.4	20	34	60	22L or 22M or 22H
MAZ32200L	20.8	21.3	21.86			20.3											22L
MAZ32200M	21.45	22	22.55			20.9											22M
MAZ32200H	22.1	22.7	23.24			21.6											22H
MAZ3240	22.8	24	25.6	17	0.05	22.3	60	25	70	0.5	180	18.4	20.4	22	33	55	24L or 24M or 24H
MAZ32400L	22.8	23.3	23.97			22.3											24L
MAZ32400M	23.5	24	24.7			23											24M
MAZ32400H	24.35	25	25.6			23.8											24H

■ Electrical characteristics within part numbers (continued)  $T_a = 25^\circ\text{C}$

•  $V_Z = 27.0\text{ V}$  to  $36.0\text{ V}$  ( $I_Z = 2\text{ mA}$ )

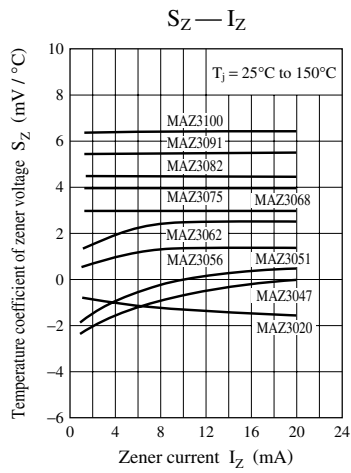
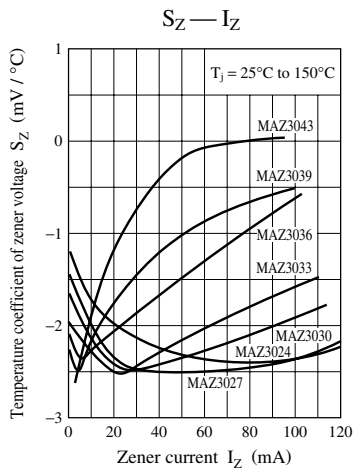
Part number	Zener voltage			Reverse current				Zener operating resistance				Temperature coefficient of zener voltage			Terminal capacitance		Marking symbol
	$V_Z$ (V)			$I_{R1}$ ( $\mu\text{A}$ )		$I_{R2}$ ( $\mu\text{A}$ )		$R_Z$ ( $\Omega$ )		$R_{ZK}$ ( $\Omega$ )		$S_Z$ (mV/ $^\circ\text{C}$ )			$C_t$ (pF)		
	$I_Z = 2\text{ mA}$			$V_R$	Max	$V_R$	Max	$I_Z = 2\text{ mA}$		$I_Z$		$I_Z = 2\text{ mA}$			$(V_R = 0\text{ V})$		
	Min	Nom	Max	(V)	Max	(V)	Max	Typ	Max	(mA)	Max	Min	Typ	Max	Typ	Max	
MAZ3270	25.1	27	28.9	19	0.05	24.8	60	25	80	0.5	200	21.4	23.4	25.3	30	50	27L or 27M or 27H
MAZ32700L	25.3	26	26.7			24.8											27L
MAZ32700M	26.3	27	27.7			25.8											27M
MAZ32700H	27.3	28	28.7			26.8											27H
MAZ3300	28	30	32	21	0.05	27.8	60	30	80	0.5	200	24.4	26.6	29.4	27	50	30L or 30M or 30H
MAZ33000L	28.3	29	29.7			27.8											30L
MAZ33000M	29.3	30	30.8			28.8											30M
MAZ33000H	30.2	31	31.8			29.7											30H
MAZ3330	31	33	35	23	0.05	30.7	60	35	80	0.5	200	27.4	29.7	33.4	25	45	33L or 33M or 33H
MAZ33300L	31.2	32	32.8			30.7											33L
MAZ33300M	32.2	33	33.8			31.7											33M
MAZ33300H	33.2	34	34.9			32.7											33H
MAZ3360	34	36	38	25	0.05	33.6	60	35	90	0.5	200	30.4	33	37.4	23	45	36L or 36M or 36H
MAZ33600L	34.1	35	35.9			33.6											36L
MAZ33600M	35.1	36	36.9			34.6											36M
MAZ33600H	36.1	37	37.9			35.6											36H

Note) 1. The  $V_Z$  value is the one after power application for 20 ms at  $T_a = 25^\circ\text{C}$ .

2. The zener voltage temperature coefficient is the one for  $T_j = 25^\circ\text{C}$  to  $150^\circ\text{C}$ .







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