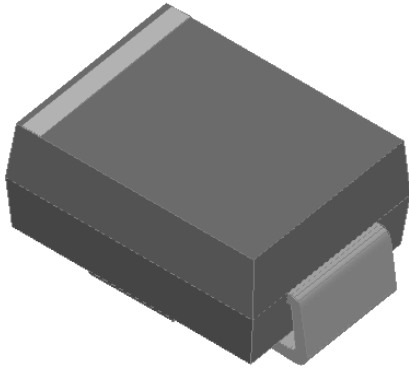


Surface Mount Fast Recovery Rectifier

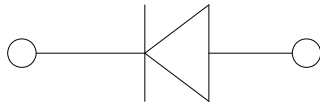


Features

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- High forward surge capability
- Fast reverse recovery time
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Part no. with suffix "Q" means AEC-Q101 qualified

Typical Applications

For use in general purpose rectification of power supplies, inverters, converters, and freewheeling diodes for consumer, automotive and telecommunication.



Mechanical Data

- **Package:** DO-214AA (SMB)
Molding compound meets UL 94 V-0 flammability rating, RoHS-compliant, halogen-free
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Polarity:** Cathode line denotes the cathode end

■Maximum Ratings (T_a=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	GR1ABQ	GR1BBQ	GR1DBQ	GR1GBQ	GR1JBQ	GR1KBQ	GR1MBQ
Device marking code			GR1AB	GR1BB	GR1DB	GR1GB	GR1JB	GR1KB	GR1MB
Maximum Repetitive Peak Reverse Voltage	V _{RRM}	V	50	100	200	400	600	800	1000
Maximum RMS Voltage	V _{RMS}	V	35	70	140	280	420	560	700
Maximum DC blocking Voltage	V _{DC}	V	50	100	200	400	600	800	1000
Average rectified output current @60Hz sine wave, resistance load, TL (Fig.1)	I _O	A	1.0						
Forward Surge Current (Non-repetitive) @60Hz Half-sine wave, 1 cycle, T _J =25°C	I _{FSM}	A	30						
Storage temperature	T _{stg}	°C	-55 ~ +150						
Junction temperature	T _J	°C	-55 ~ +150						



GR1ABQ THRU GR1MBQ

■Electrical Characteristics (T_a=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	TEST CONDITIONS	GR1ABQ	GR1BBQ	GR1DBQ	GR1GBQ	GR1JBQ	GR1KBQ	GR1MBQ
Maximum instantaneous forward voltage	V _F	V	I _{FM} =1.0A	1.3						
Maximum reverse recovery time	t _{rr}	ns	I _F =0.5A, I _R =1.0A, I _{tr} =0.25A	150				250	500	
Maximum DC reverse current at rated DC blocking voltage	I _R	μA	T _j =25°C	5.0						
			T _j =125°C	100						
Typical junction capacitance	C _j	pF	V _R =4V, f=1 MHz	20				18	10	

■Thermal Characteristics (T_a=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	GR1ABQ	GR1BBQ	GR1DBQ	GR1GBQ	GR1JBQ	GR1KBQ	GR1MBQ
Thermal Resistance	R _{θJA} ⁽¹⁾	°C/W	75						
	R _{θJL} ⁽¹⁾		20						

Note:

(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 0.3" x 0.3" (8.0 mm x 8.0 mm) copper pad areas

■ Characteristics (Typical)

Fig.1:Forward Current Derating Curve

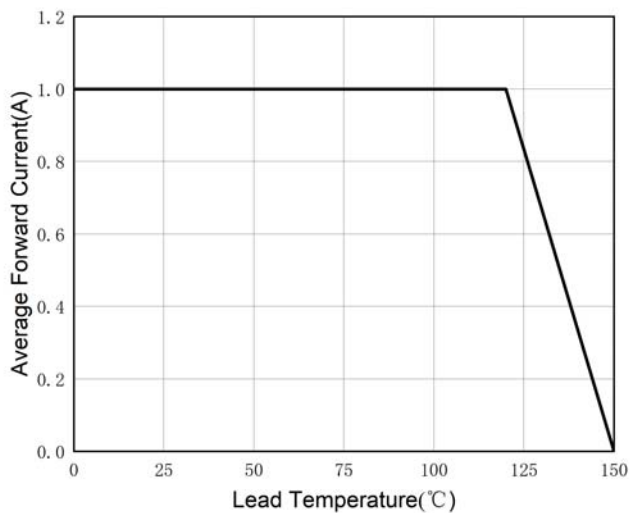
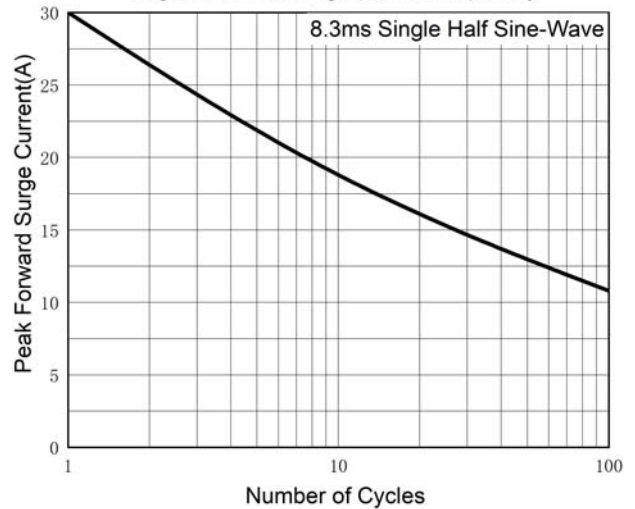


Fig.2: Forward Surge Current Capability





GR1JBJ

Instantaneous Reverse Current (μA)

Percent of Rated Peak Reverse Voltage (%)

$T_J = 25^\circ\text{C}$
 $T_J = 100^\circ\text{C}$
 $T_J = 125^\circ\text{C}$
 $T_J = 150^\circ\text{C}$

Percent of Rated Peak Reverse Voltage (%)	$T_J = 25^\circ\text{C}$ (μA)	$T_J = 100^\circ\text{C}$ (μA)	$T_J = 125^\circ\text{C}$ (μA)	$T_J = 150^\circ\text{C}$ (μA)
20	0.015	1.3	5.0	15.0
40	0.025	1.6	6.0	18.0
60	0.035	1.9	7.0	21.0
80	0.050	2.3	8.0	24.0
100	0.070	2.8	9.0	27.0

Figure 10 is a line graph showing the Instantaneous Reverse Current (I_R) in μA on the Y-axis (logarithmic scale from 0.001 to 100) versus the Percent of Rated Peak Reverse Voltage (%) on the X-axis (linear scale from 20 to 100). The graph displays the reverse current characteristics for the GR1KBQ-GR1MBQ diodes at four different temperatures: $T_J = 25^\circ C$ (blue line), $T_J = 100^\circ C$ (green line), $T_J = 125^\circ C$ (purple line), and $T_J = 150^\circ C$ (yellow line). The reverse current increases with both the percent of rated peak reverse voltage and the junction temperature.

Percent of Rated Peak Reverse Voltage (%)	$T_J = 25^\circ C$ (I_R in μA)	$T_J = 100^\circ C$ (I_R in μA)	$T_J = 125^\circ C$ (I_R in μA)	$T_J = 150^\circ C$ (I_R in μA)
20	~0.02	~1.8	~7.0	~25
40	~0.03	~2.5	~9.0	~35
60	~0.05	~3.0	~10.0	~45
80	~0.07	~3.5	~12.0	~55
100	~0.1	~4.0	~15.0	~70

The circuit diagram shows a pulse generator (Note 2) connected to a diode under test (DUT) in series with a 10 Ω noninductive resistor. The DUT is in parallel with a 1 Ω noninductive resistor. This parallel combination is in series with a 50 Ω noninductive resistor and a DC voltage source. An oscilloscope (Note 1) is connected across the 1 Ω resistor. The oscilloscope trace shows a current waveform with a rise time of 7 ns and a fall time of 10 ns. The current levels are +0.5 A and -1.0 A. The time scale is set to 5/10 ns/cm.

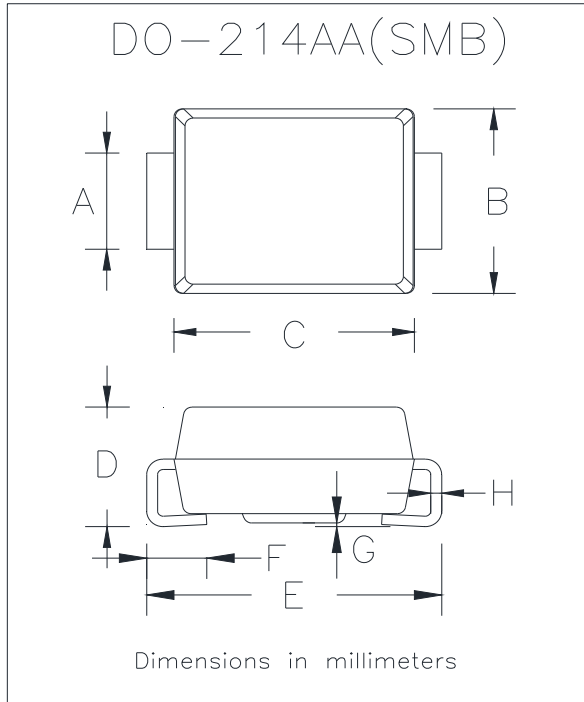


GR1ABQ THRU GR1MBQ

■ Ordering Information (Example)

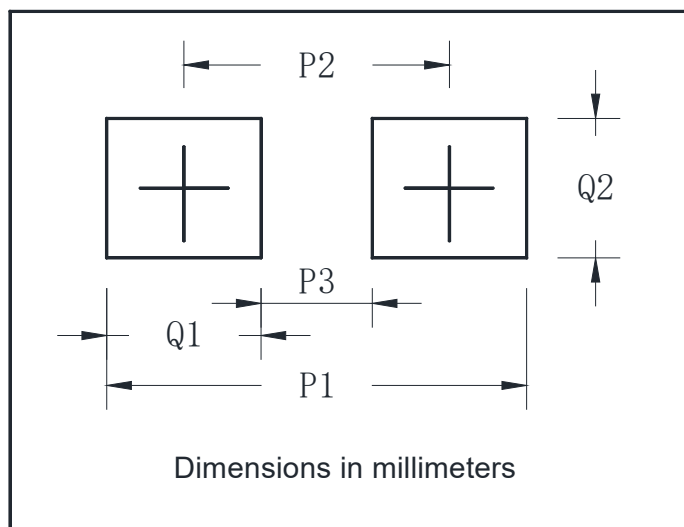
PREFERED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
GR1ABQ-GR1MBQ	F1	Approximate 0.1003	3000	48000	13" reel

■ Outline Dimensions



DO-214AA(SMB)		
Dim	Min	Max
A	1.85	2.15
B	3.30	3.94
C	4.05	4.75
D	1.99	2.61
E	5.21	5.59
F	0.90	1.41
G	0.05	0.20
H	0.15	0.31

■ Suggested pad layout

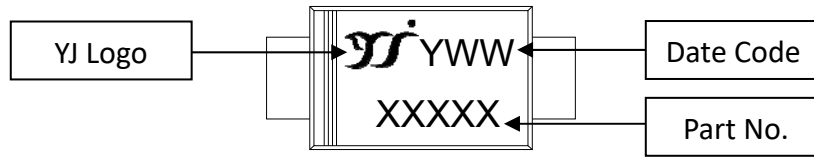


DO-214AA(SMB)	
Dim	Millimeters
P1	6.8
P2	4.3
P3	1.8
Q1	2.5
Q2	2.3



GR1ABQ THRU GR1MBQ

■ Marking Information



Note:

1. All marking is at middle of the product body
2. All marking is in laser printing
3. XXXXX is marking code, like GR1MBQ marking code is GR1MB.
4. Body color: Black
5. YWW is date code, "Y" is year. "WW" is week.

For instance:

The 17th week of 2024, date code is 417

The 17th week of 2025, date code is 517



GR1ABQ THRU GR1MBQ

Disclaimer

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The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), Yangjie or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

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