

LBS05-QH THRU LBS10-QH

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LBS05-QH THRU LBS10-QH

1.0A Miniature Glass Passivated Single-Phase Surface Mount Bridge Rectifiers-50V-1000V

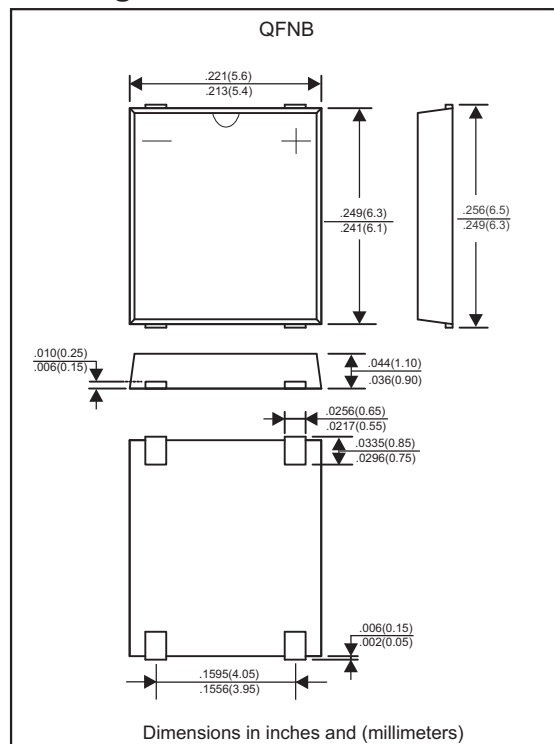
Features

- Low profile package : 1.00 mm (typ.)
- Glass passivated chip junction.
- Flat lead plastic package.
- Ideally suited for automatic assembly.
- Ultra thin profile package for space constrained utilization.
- Low forward voltage drop.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex. LBS05-QH-H.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, QFN8
- Terminals : Solder plated, solderable per MIL-STD-202, Method 208
- Polarity : marked on body
- Mounting Position : Any
- Weight : Approximated 0.098 gram

Package outline



Maximum ratings (AT $T_A=25^{\circ}\text{C}$ unless otherwise noted)

PARAMETER	SYMBOLS	LBS05-QH	LBS1-QH	LBS2-QH	LBS4-QH	LBS6-QH	LBS8-QH	LBS10-QH	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V_{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Maximum average forward rectified current	I_o	1.0							A
Peak forward surge current 8.3ms single half sine-wave(JEDEC method)	I_{FSM}	30							A
Maximum Rating for fusing ($t < 8.3$ ms)	I^2t	3.7							A^2s
Operating junction temperature range	T_J	-55 to +150							$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-65 to +175							$^{\circ}\text{C}$

Electrical characteristics (AT $T_A=25^{\circ}\text{C}$ unless otherwise noted)

PARAMETER	SYMBOLS	LBS05-QH	LBS1-QH	LBS2-QH	LBS4-QH	LBS6-QH	LBS8-QH	LBS10-QH	UNIT
Maximum forward voltage at $I_F=1.0A$	V_F	1.10							V
Maximum DC reverse current at $T_J=25^{\circ}\text{C}$ at rated DC blocking voltage	I_R	5.0 500							μA μA

Thermal characteristics

PARAMETER	SYMBOLS	LBS05-QH	LBS1-QH	LBS2-QH	LBS4-QH	LBS6-QH	LBS8-QH	LBS10-QH	UNIT
Typical thermal resistance junction to ambient (1)	$R_{\theta JA}$	55							$^{\circ}\text{C/W}$
Typical thermal resistance junction to case (1) per leg	$R_{\theta JC}$	35							$^{\circ}\text{C/W}$

Note 1: Mounted on Aluminum substrate 15 x 15 x 1.7mm.

Rating and characteristic curves (LBS05-QH THRU LBS10-QH)

FIG.1-FORWARD CURRENT DERATING CURVE

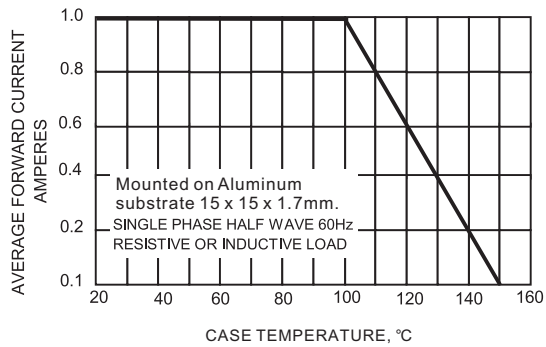


FIG.2 - MAXIMUM NON-REPETITIVE SURGE CURRENT

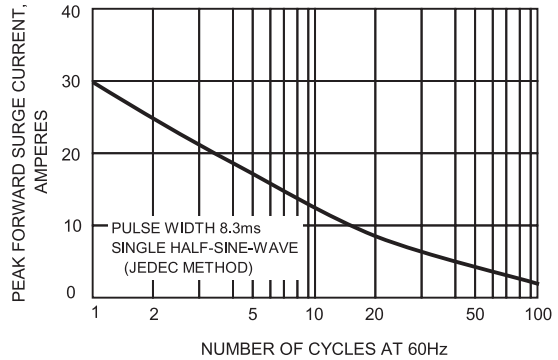


FIG.3-TYPICAL REVERSE CHARACTERISTICS

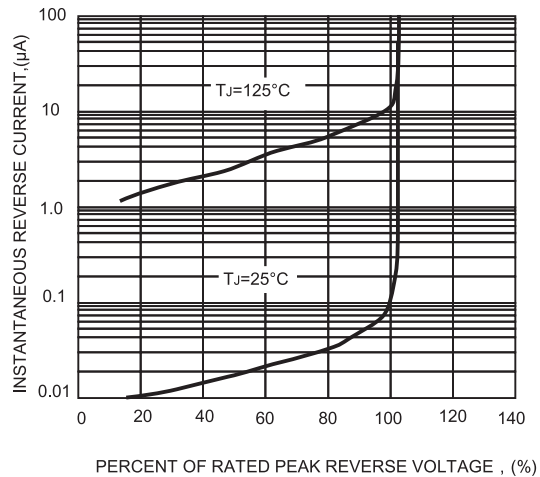
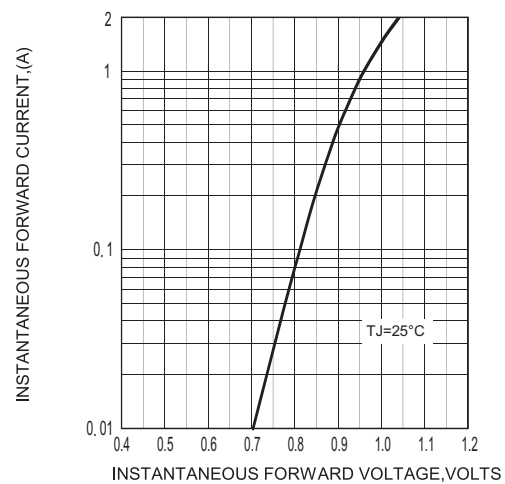
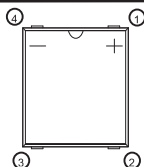
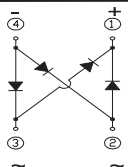


FIG.4-TYPICAL FORWARD CHARACTERISTICS



LBS05-QH THRU LBS10-QH

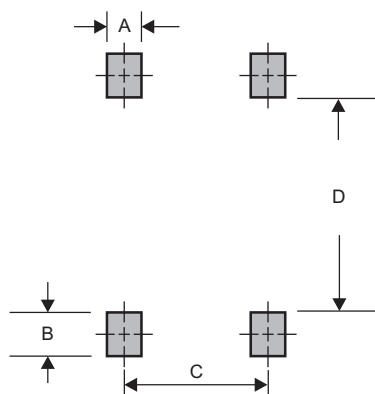
Pinning information

Simplified outline	Symbol
	

Marking

Type number	Marking code
LBS05-QH	LBS05
LBS1-QH	LBS1
LBS2-QH	LBS2
LBS4-QH	LBS4
LBS6-QH	LBS6
LBS8-QH	LBS8
LBS10-QH	LBS10

Suggested solder pad layout

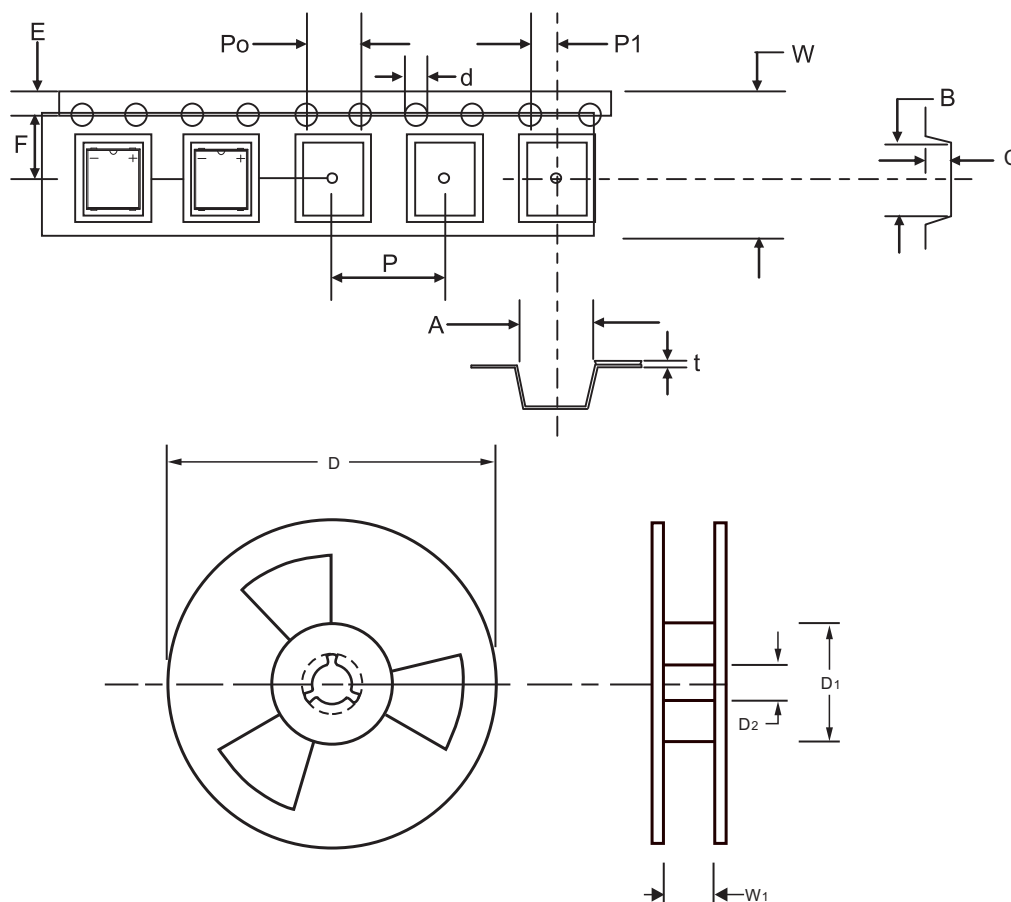


Dimensions in inches and (millimeters)

PACKAGE	A	B	C	D
QFNB	0.032 (0.80)MIN	0.044 (1.10)MIN	0.158(4.00)REF	0.182 (4.60)REF

LBS05-QH THRU LBS10-QH

Packing information



unit:mm

Item	Symbol	Tolerance	QFNB
Carrier width	A	0.1	5.75
Carrier length	B	0.1	6.65
Carrier depth	C	0.1	1.25
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	330.00
13" Reel inner diameter	D1	min	50.00
7" Reel outside diameter	D	2.0	-
7" Reel inner diameter	D1	min	-
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.05	5.50
Punch hole pitch	P	0.1	8.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.05	2.00
Overall tape thickness	t	0.1	0.30
Tape width	W	0.3	12.00
Reel width	W1	1.0	12~14.4

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

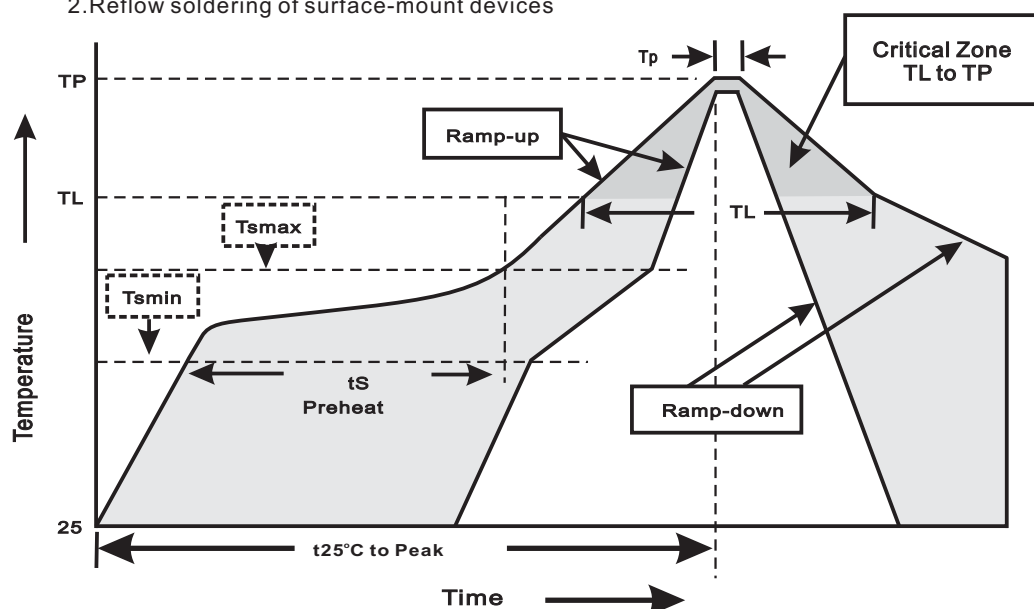
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Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
QFNB	13"	5,000	8.0	10,000	360*340*45	330	380*365*400	80,000	14.0

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T_L to T_P)	<3°C/sec
Preheat -Temperature Min(T_{smin}) -Temperature Max(T_{smax}) -Time(min to max)(t_s)	150°C 200°C 60~120sec
T_{smax} to T_L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T_L) -Time(t_L)	217°C 60~260sec
Peak Temperature(T_P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t_P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes

LBS05-QH THRU LBS10-QH**High reliability test capabilities**

Item Test	Conditions	Reference
1. Solder Resistance	at $260 \pm 5^{\circ}\text{C}$ for $10 \pm 2\text{sec.}$ immerse body into solder $1/16" \pm 1/32"$	MIL-STD-750D METHOD-2031
2. Solderability	at $245 \pm 5^{\circ}\text{C}$ for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	$V_R = 80\%$ rate at $T_J = 150^{\circ}\text{C}$ for 168 hrs.	MIL-STD-750D METHOD-1038
4. Forward Operation Life	Rated average rectifier current at $T_A = 25^{\circ}\text{C}$ for 500hrs.	MIL-STD-750D METHOD-1027
5. Intermittent Operation Life	$T_A = 25^{\circ}\text{C}$, $I_F = I_O$ On state: power on for 5 min. off state: power off for 5 min. on and off for 500 cycles.	MIL-STD-750D METHOD-1036
6. Pressure Cooker	$15P_{SIG}$ at $T_A = 121^{\circ}\text{C}$ for 4 hrs.	JESD22-A102
7. Temperature Cycling	-55°C to $+125^{\circ}\text{C}$ dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
8. Forward Surge	8.3ms single half sine-wave , one surge.	MIL-STD-750D METHOD-4066-2
9. Humidity	at $T_A = 85^{\circ}\text{C}$, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
10. High Temperature Storage Life	at 175°C for 1000 hrs.	MIL-STD-750D METHOD-1031