

- ★ Super Low Gate Charge
- ★ Green Device Available
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

Product Summary



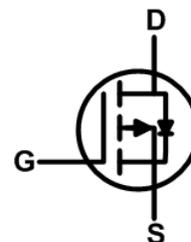
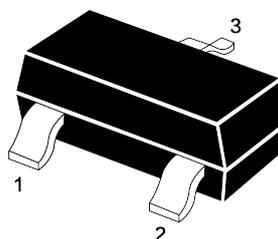
BVDSS	RDSON	ID
-20V	93mΩ	-2.0A

Description

The JH2301B is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The JH2301B meet the RoHS and Green Product requirement with full function reliability approved.

SOT-23 Pin Configurations



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D @ T_A=25^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V^1$	-2.0	A
$I_D @ T_A=70^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V^1$	-1.4	A
I_{DM}	Pulsed Drain Current ²	-8	A
$P_D @ T_A=25^\circ C$	Total Power Dissipation ³	0.8	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	156	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	---	$^\circ C/W$

Electrical Characteristics

$T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
--------	-----------	-----------------	-----	-----	-----	-------

Off Characteristics

BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	-20	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -20\text{ V}, V_{GS} = 0\text{ V}$	--	--	-1	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	$V_{GS} = -12\text{ V}, V_{DS} = 0\text{ V}$	--	--	-100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	$V_{GS} = 12\text{ V}, V_{DS} = 0\text{ V}$	--	--	100	nA

On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	-0.45	-0.50	-0.55	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = -4.5\text{ V}, I_D = -3.4\text{ A}$	--	93	100	m Ω
		$V_{GS} = -2.5\text{ V}, I_D = -2.5\text{ A}$	--	116	140	

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = -10\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$	--	267	-	pF
C_{oss}	Output Capacitance		--	30	-	pF
C_{riss}	Reverse Transfer Capacitance		--	28	-	pF

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{GS} = -4.5\text{ V}, V_{DS} = -10\text{ V},$ $R_G = 3\text{ }\Omega, R_L = 5\text{ }\Omega$	--	10	--	ns
t_r	Turn-On Rise Time		--	6	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	20	--	ns
t_f	Turn-Off Fall Time		--	7	--	ns
Q_g	Total Gate Charge	$V_{DS} = -10\text{ V}, I_D = -2\text{ A},$ $V_{GS} = -4.5\text{ V}$	--	3.1	--	nC
Q_{gs}	Gate-Source Charge		--	0.5	--	nC
Q_{gd}	Gate-Drain Charge		--	0.8	--	nC
R_G	Gate Resistance	$f = 1\text{ MHz}$	--	6.1	--	Ω

Drain-Source Diode Characteristics and Maximum Ratings

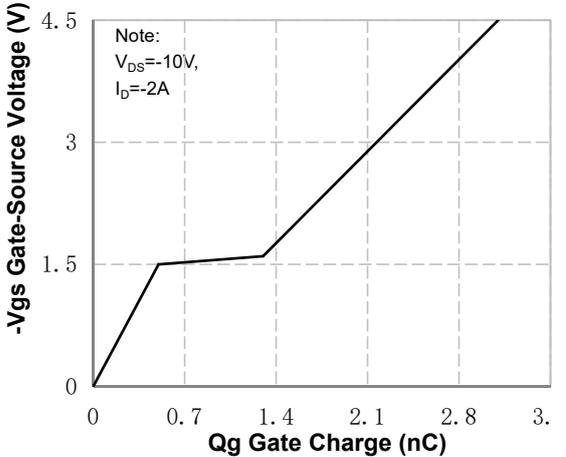
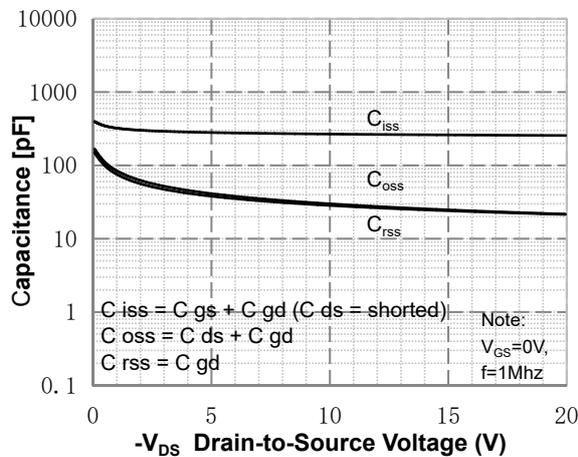
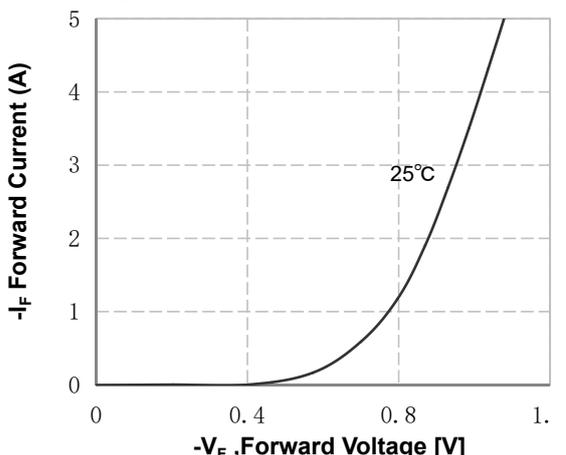
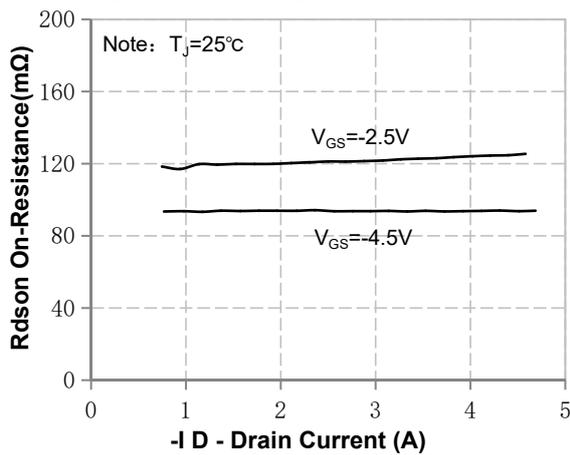
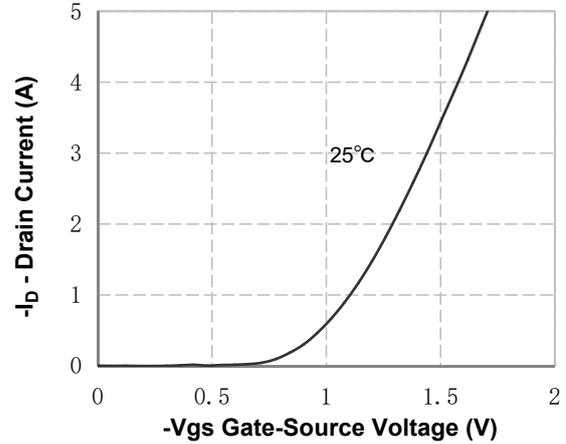
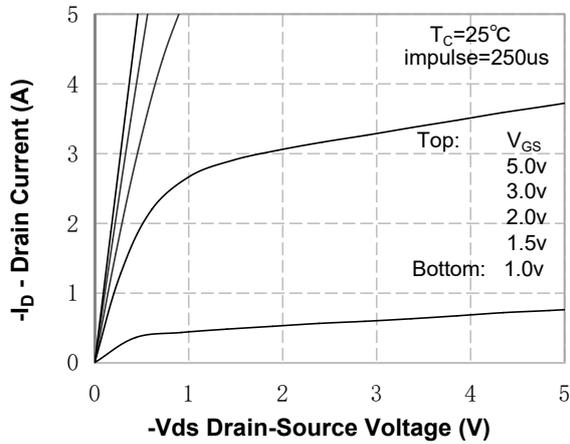
I_S	Maximum Continuous Drain-Source Diode Forward Current	--	--	-2	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current	--	--	-8	A
V_{SD}	Drain to Source Diode Forward Voltage, $V_{GS} = 0\text{ V}, I_{SD} = -3\text{ A}, T_J = 25^\circ\text{C}$	--	--	-1.2	V

Notes:

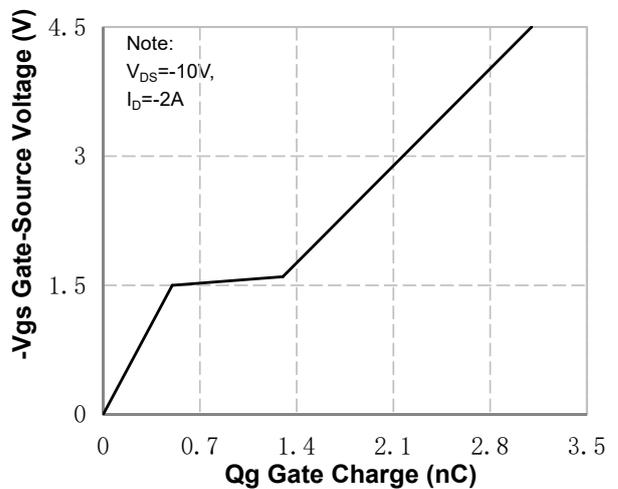
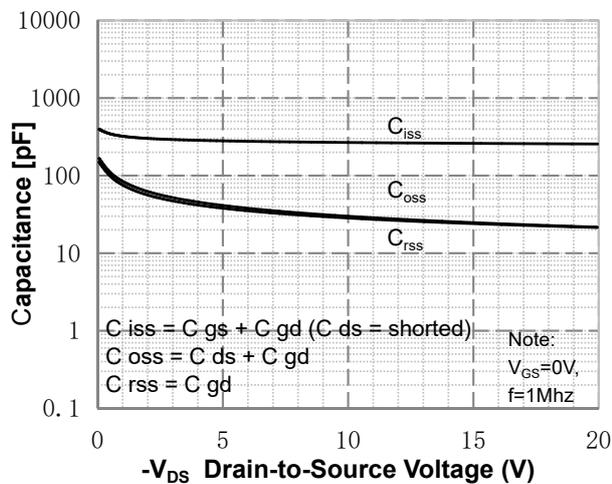
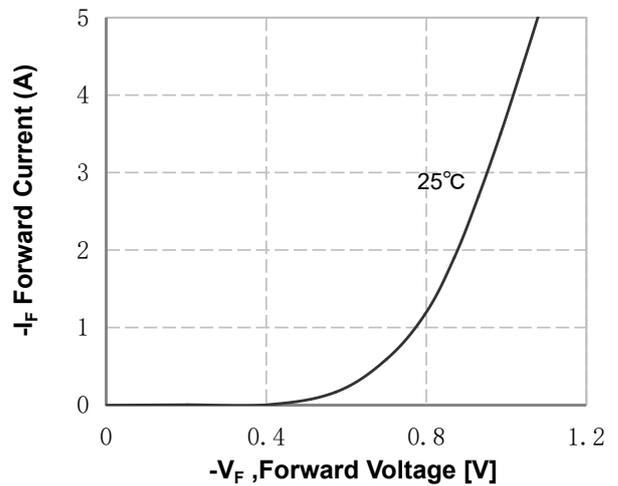
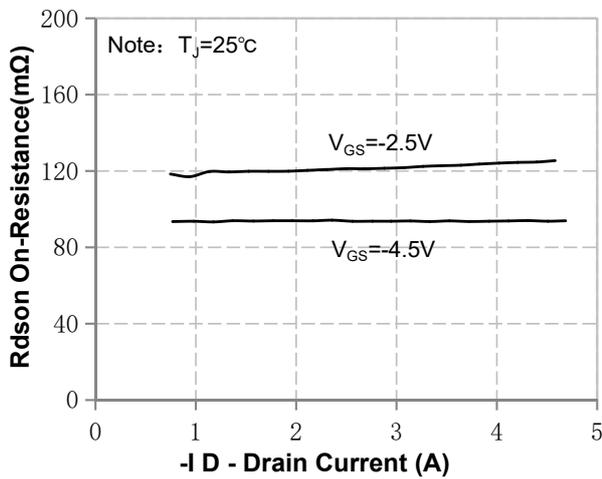
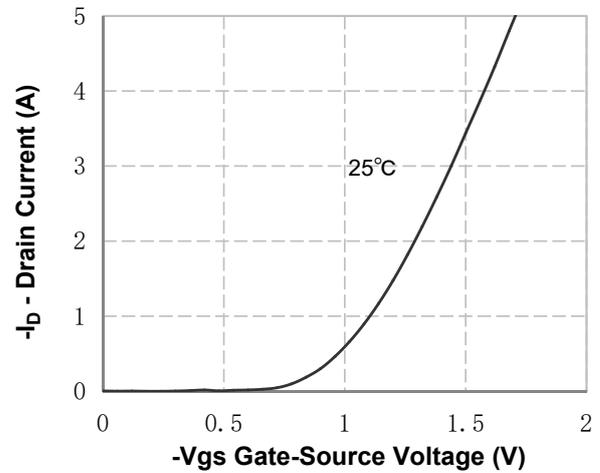
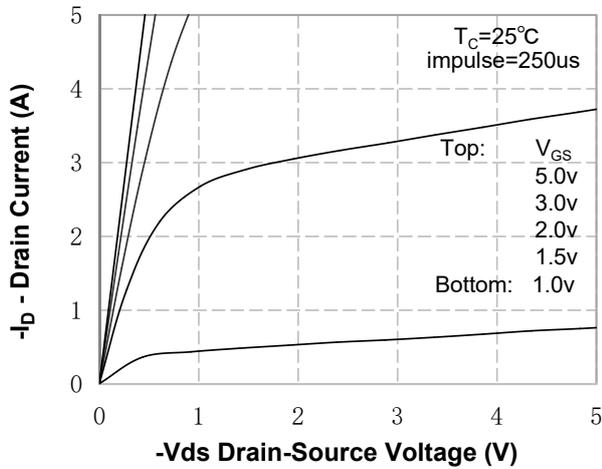
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. Device mounted on FR-4 PCB, 1inch x 0.85inch x 0.062 inch
3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$

Typical Performance Characteristics

P- Channel Typical Characteristics

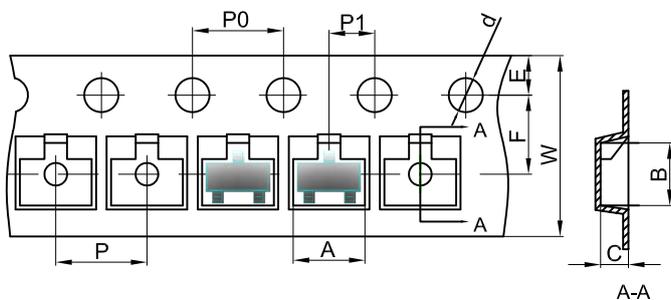


P- Channel Typical Characteristics



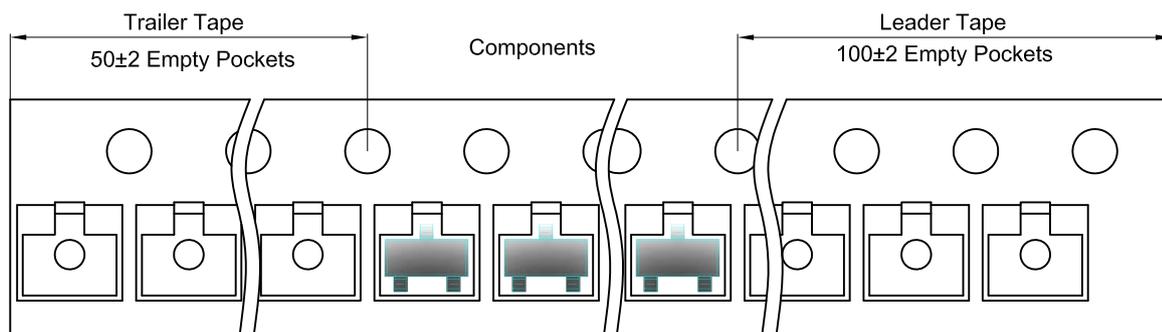
SOT-23 Tape and Reel

SOT-23 Embossed Carrier Tape

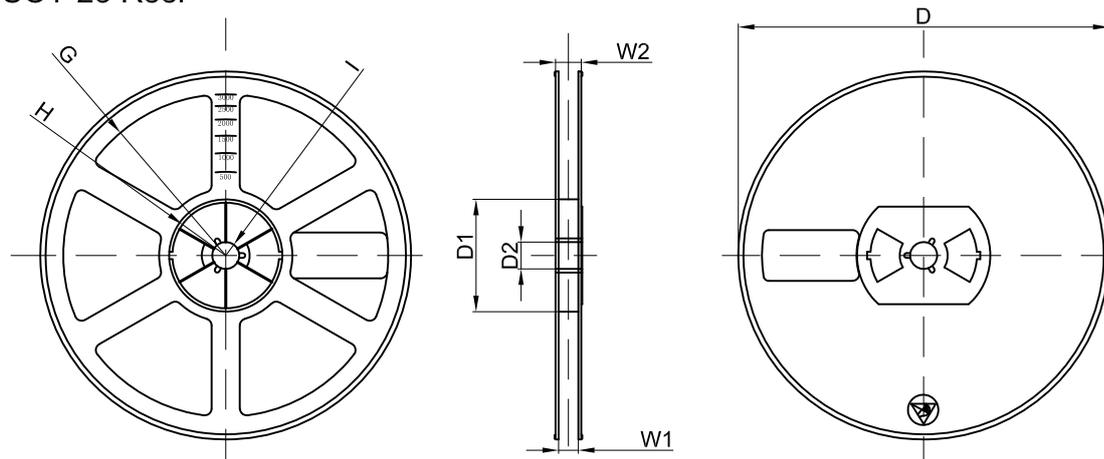


Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOT-23 Tape Leader and Trailer

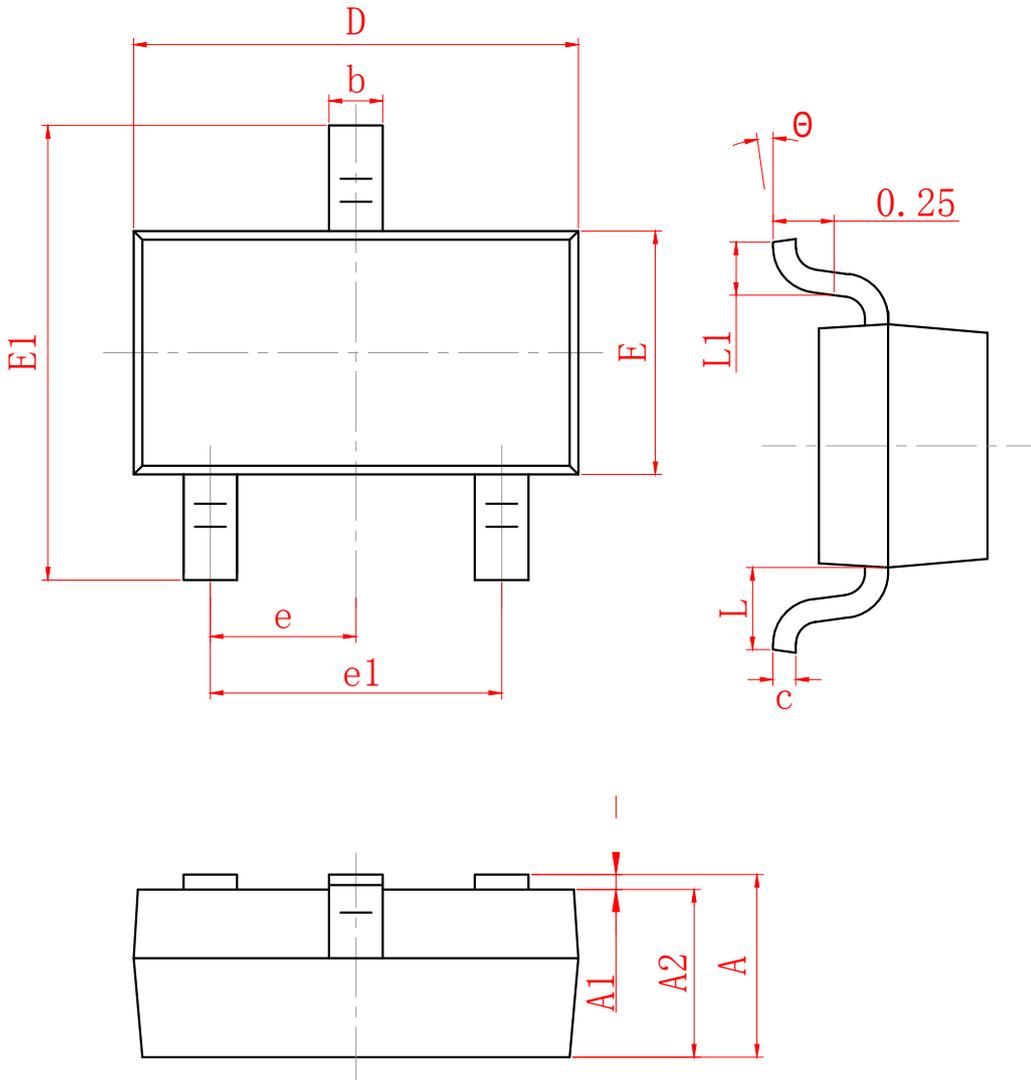


SOT-23 Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	45,000 pcs	203×203×195	180,000 pcs	438×438×220	



SYMBOL	MILLIMETER	
	MIN	MAX
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950 TYP	
e1	1.800	2.000
L	0.550 REF	
L1	0.300	0.500
θ	0°	8°

DISCLAIMER

JHG PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with JHG products. You are solely responsible for

- (1) selecting the appropriate JHG products for your application;
- (2) designing, validating and testing your application;
- (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements.

These resources are subject to change without notice. JHG grants you permission to use these resources only for development of an application that uses the JHG products described in the resource. Other reproduction and display of these resources are prohibited. No license is granted to any other JHG intellectual property right or to any third party intellectual property right. JHG disclaims responsibility for, and you will fully indemnify JHG and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.