HT1015-1
1.5V Low Power LDO

Features

- Low power consumption
- Low voltage drop
- Low temperature coefficient
- Wide operating voltage (12V max.)
- TO-92, SOT-89 and SOT-25 package

Applications

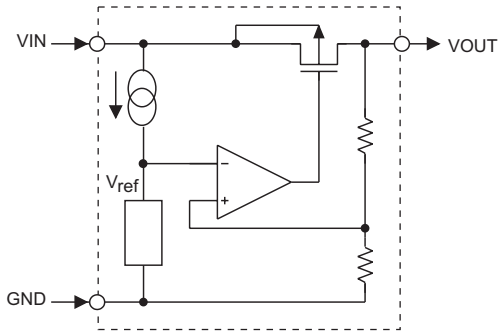
- Battery-powered equipment
- Communication equipment
- Audio/Video equipment

General Description

The HT1015-1 is a three-terminal low power voltage regulator implemented in CMOS technology. It is available with a fixed output voltage at 1.5V. CMOS technology ensures low voltage drop and low quiescent current.

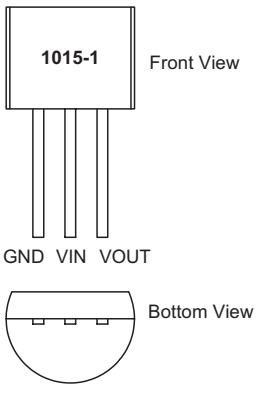
Although designed primarily as a fixed voltage regulator, this device can be used with external components to obtain variable voltages and currents.

Block Diagram

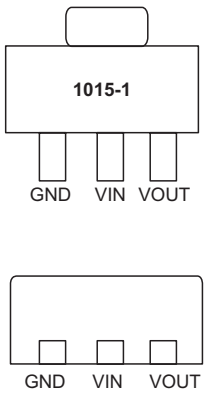


Pin Assignment

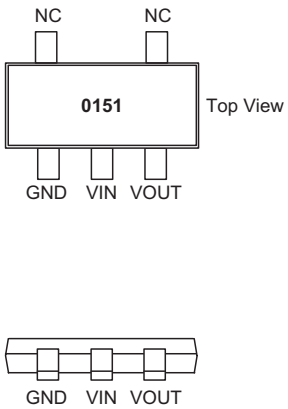
TO-92



SOT-89



SOT-25



Note: For lead free devices, TO-92 package will add a "#" mark at the end of the date code, whereas SOT-89 and SOT-25 packages will add a "#" mark at the end of the marking.

Absolute Maximum Ratings

Supply Voltage .....V_{SS}–0.3V to V_{SS}+13V

Power Consumption (*1) 200mW

Power Consumption (*2) 150mW

Storage Temperature .....–50°C to 125°C

Operating Temperature.....–40°C to 85°C

Note: These are stress ratings only. Stresses exceeding the range specified under "Absolute Maximum Ratings" may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.
*1: applied to SOT-89 and TO-92
*2: applied to SOT-25

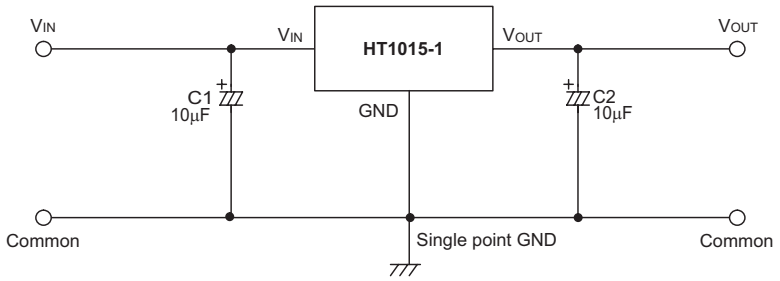
Electrical Characteristics

Ta=25°C

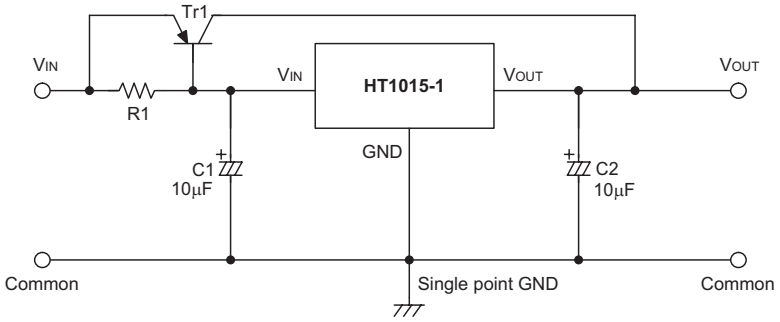
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
V_{OUT}	Output Voltage Tolerance	3.5V	I_{OUT}=0.5mA	1.455	1.5	1.545	V
I_{OUT}	Output Current	3.5V	—	7.0	18	—	mA
ΔV_{OUT}	Load Regulation	3.5V	1mA≤I_{OUT}≤7mA	—	15	—	mV
V_{DIF}	Voltage Drop	—	I_{OUT}=0.5mA	—	250	—	mV
I_{SS}	Current Consumption	3.5V	No load	—	2.2	5.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} x V_{OUT}}$	Line Regulation	—	2.5V≤V_{IN}≤12V I_{OUT}=0.5mA	—	0.1	—	%/V
V_{IN}	Input Voltage	—	—	—	—	12	V
$\frac{\Delta V_{OUT}}{\Delta Ta}$	Temperature Coefficient	3.5V	I_{OUT}=0.5mA –40°C~85°C	—	–0.75	—	mV/°C

Application Circuits

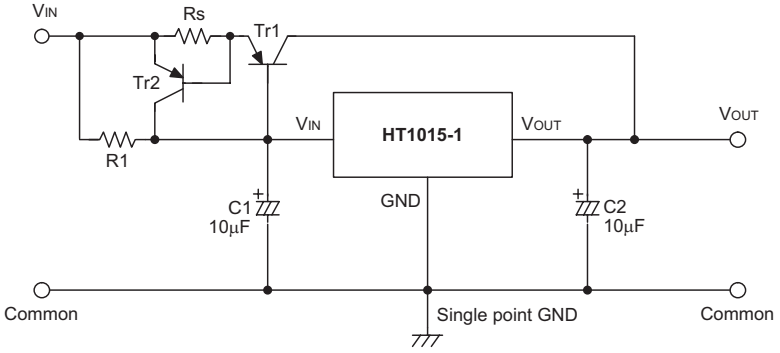
Basic Circuit



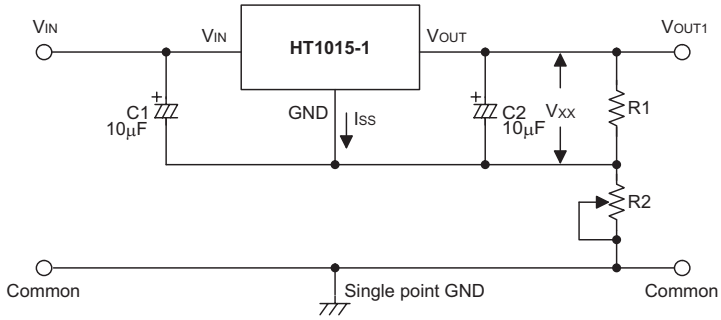
High Output Current Positive Voltage Regulator



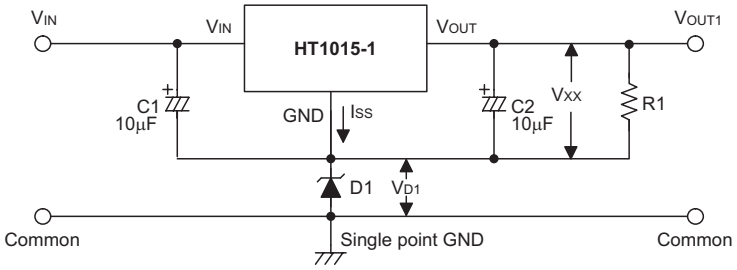
Short-Circuit Protection Using External Transistors



Increased Output Voltage Circuits

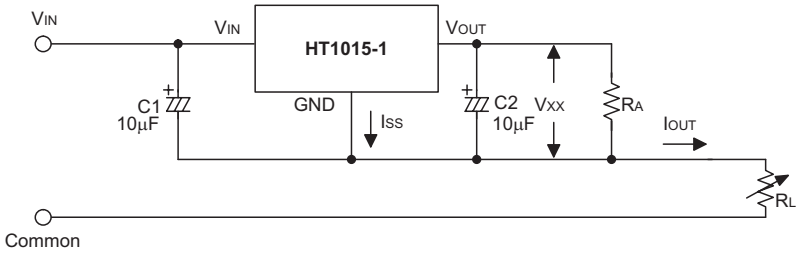


$$V_{OUT1} = V_{XX} \left(1 + \frac{R2}{R1}\right) + I_{SS} R2$$



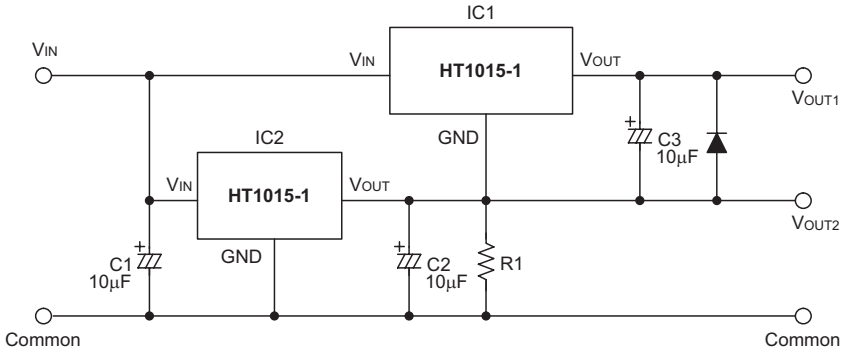
$$V_{OUT1} = V_{XX} + V_{D1}$$

Constant Current Regulator



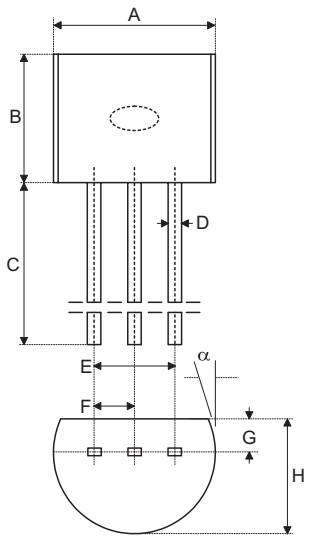
$$I_{OUT} = \frac{V_{XX}}{R_A} + I_{SS}$$

Dual Supply



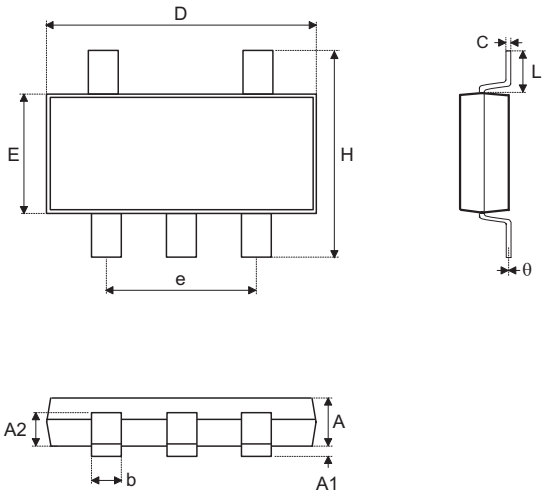
Package Information

3-pin TO-92 Outline Dimensions



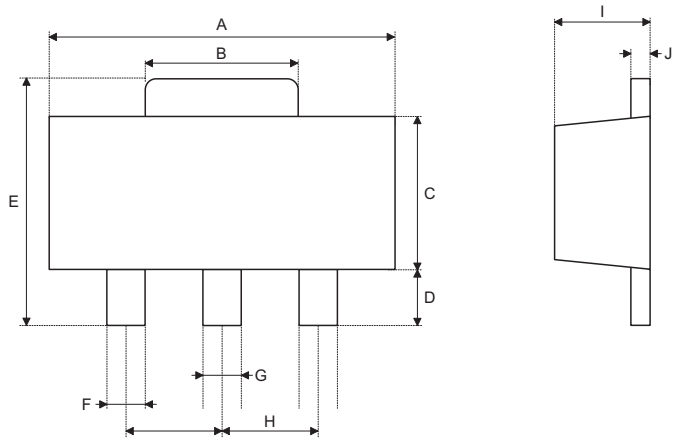
Symbol	Dimensions in mil		
	Min.	Nom.	Max.
A	170	—	200
B	170	—	200
C	500	—	—
D	11	—	20
E	90	—	110
F	45	—	55
G	45	—	65
H	130	—	160
I	8	—	18
α	4°	—	6°

5-pin SOT-25 Outline Dimensions



Symbol	Dimensions in mm		
	Min.	Nom.	Max.
A	1	—	1.3
A1	—	—	0.1
A2	0.7	—	0.9
b	0.35	—	0.5
C	0.1	—	0.25
D	2.7	—	3.1
E	1.4	—	1.8
e	—	1.9	—
H	2.6	—	3
L	0.37	—	—
θ	1°	—	9°

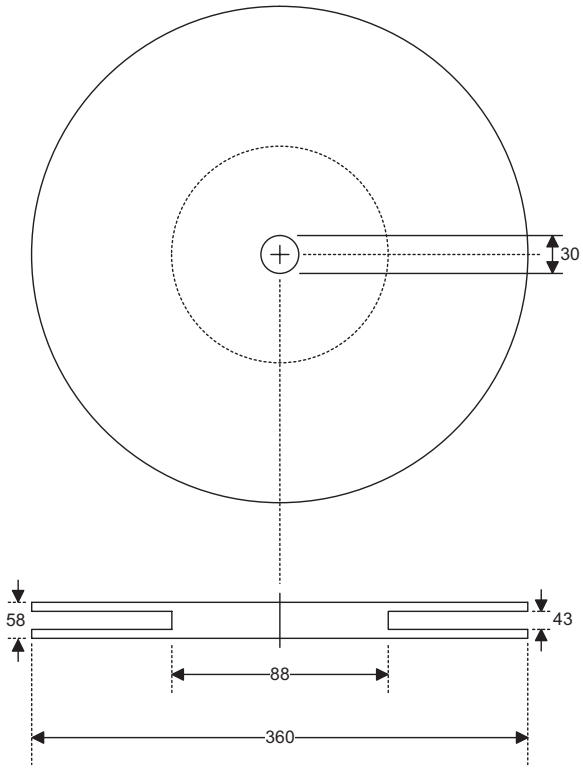
3-pin SOT-89 Outline Dimensions

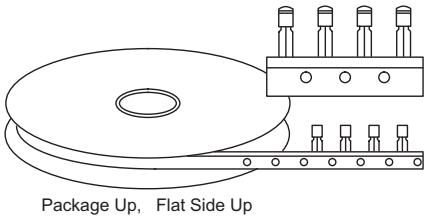


Symbol	Dimensions in mil		
	Min.	Nom.	Max.
A	173	—	181
B	64	—	72
C	90	—	102
D	35	—	47
E	155	—	167
F	14	—	19
G	17	—	22
H	—	59	—
I	55	—	63
J	14	—	17

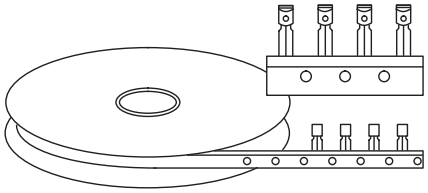
Product Tape and Reel Specifications

TO-92 Reel Dimensions (Unit: mm)



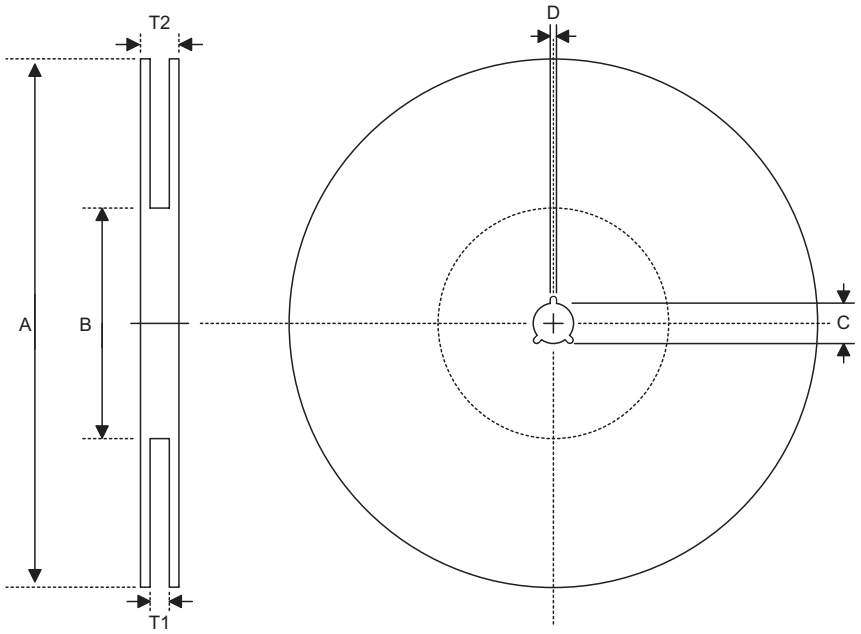


Package Up, Flat Side Up



Package Up, Flat Side Down

Reel Dimensions



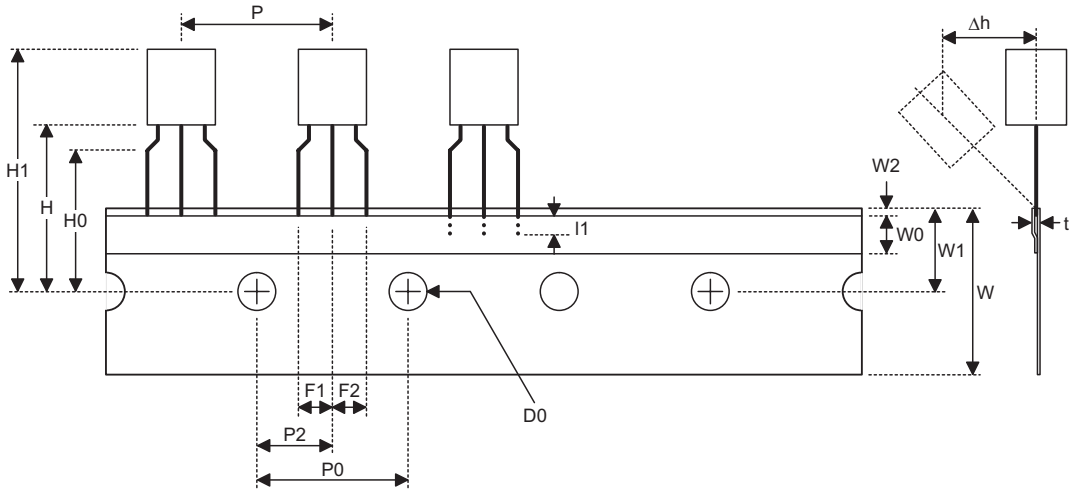
SOT-89

Symbol	Description	Dimensions in mm
A	Reel Outer Diameter	180±1.0
B	Reel Inner Diameter	62±1.5
C	Spindle Hole Diameter	12.75+0.15
D	Key Slit Width	1.9±0.15
T1	Space Between Flange	12.4+0.2
T2	Reel Thickness	17−0.4

SOT-25

Symbol	Description	Dimensions in mm
A	Reel Outer Diameter	178±1
B	Reel Inner Diameter	62±1
C	Spindle Hole Diameter	13±0.2
D	Key Slit Width	2.5±0.25
T1	Space Between Flange	8.4+1.5
T2	Reel Thickness	11.4+1.5

Carrier Tape Dimensions



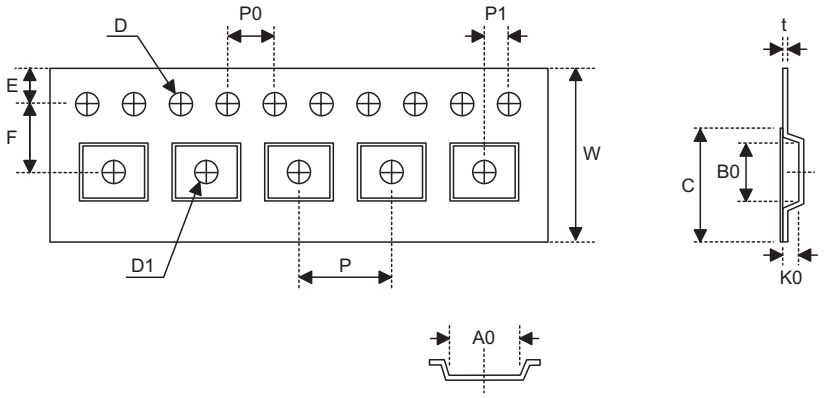
TO-92

Symbol	Description	Dimensions in mm
I1	Taped Lead Length	(2.5)
P	Component Pitch	12.7±1.0
P0	Perforation Pitch	12.7±0.3
P2	Component to Perforation (Length Direction)	6.35±0.4
F1	Lead Spread	2.5+0.4 −0.1
F2	Lead Spread	2.5+0.4 −0.1
Δh	Component Alignment	0±0.1
W	Carrier Tape Width	18.0+1.0 −0.5
W0	Hold-down Tape Width	6.0±0.5
W1	Perforation Position	9.0±0.5
W2	Hold-down Tape Position	(0.5)
H0	Lead Clinch Height	16.0±0.5
H1	Component Height	Less than 24.7
D0	Perforation Diameter	4.0±0.2
t	Taped Lead Thickness	0.7±0.2
H	Component Base Height	19.0±0.5

Note: Thickness less than 0.38±0.05mm~0.5mm

P0 Accumulated pitch tolerance: ±1mm/20pitches.

( ) Bracketed figures are for consultation only



SOT-89

Symbol	Description	Dimensions in mm
W	Carrier Tape Width	12.0+0.3 −0.1
P	Cavity Pitch	8.0±0.1
E	Perforation Position	1.75±0.1
F	Cavity to Perforation (Width Direction)	5.5±0.05
D	Perforation Diameter	1.5+0.1
D1	Cavity Hole Diameter	1.5+0.1
P0	Perforation Pitch	4.0±0.1
P1	Cavity to Perforation (Length Direction)	2.0±0.10
A0	Cavity Length	4.8±0.1
B0	Cavity Width	4.5±0.1
K0	Cavity Depth	1.8±0.1
t	Carrier Tape Thickness	0.30±0.013
C	Cover Tape Width	9.3

SOT-25

Symbol	Description	Dimensions in mm
W	Carrier Tape Width	8±0.3
P	Cavity Pitch	4
E	Perforation Position	1.75
F	Cavity to Perforation (Width Direction)	3.5±0.05
D	Perforation Diameter	1.5+0.1
D1	Cavity Hole Diameter	1.5+0.1
P0	Perforation Pitch	4
P1	Cavity to Perforation (Length Direction)	2
A0	Cavity Length	3.15
B0	Cavity Width	3.2
K0	Cavity Depth	1.4
t	Carrier Tape Thickness	0.2±0.03
C	Cover Tape Width	5.3

Holtek Semiconductor Inc. (Headquarters)
No.3, Creation Rd. II, Science Park, Hsinchu, Taiwan
Tel: 886-3-563-1999
Fax: 886-3-563-1189
http://www.holtek.com.tw

Holtek Semiconductor Inc. (Taipei Sales Office)
4F-2, No. 3-2, YuanQu St., Nankang Software Park, Taipei 115, Taiwan
Tel: 886-2-2655-7070
Fax: 886-2-2655-7373
Fax: 886-2-2655-7383 (International sales hotline)

Holtek Semiconductor Inc. (Shanghai Sales Office)
7th Floor, Building 2, No.889, Yi Shan Rd., Shanghai, China 200233
Tel: 021-6485-5560
Fax: 021-6485-0313
http://www.holtek.com.cn

Holtek Semiconductor Inc. (Shenzhen Sales Office)
43F, SEG Plaza, Shen Nan Zhong Road, Shenzhen, China 518031
Tel: 0755-8346-5589
Fax: 0755-8346-5590
ISDN: 0755-8346-5591

Holtek Semiconductor Inc. (Beijing Sales Office)
Suite 1721, Jinyu Tower, A129 West Xuan Wu Men Street, Xicheng District, Beijing, China 100031
Tel: 010-6641-0030, 6641-7751, 6641-7752
Fax: 010-6641-0125

Holmate Semiconductor, Inc. (North America Sales Office)
46712 Fremont Blvd., Fremont, CA 94538
Tel: 510-252-9880
Fax: 510-252-9885
http://www.holmate.com