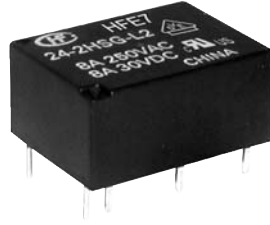# HFE7   SUBMINIATURE INTERMEDIATE POWER RELAY

C **℞U** US

File No.:E134517

VDE
File No.:40027342

Features

● High switching capacity
  1A, 1B: 10A 250VAC/30VDC;
  2A, 2B, 1A + 1B: 8A 250VAC/30VDC
● High sensitive
● 4kV dielectric strength (between coil & contacts)
● Single side stable and latching types available
● 1 Form A, 1 Form B, 2 Form A, 2 Form B and 1A + 1B
  contact arrangement

CONTACT DATA

Contact arrangement	1A, 1B	2A, 2B, 1A +1B
Contact resistance[1]	AgNi +Au plated: 30mΩ max.(at 1A 6VDC) AgNi: 50mΩ max.(at 1A 6VDC) AgSnO$_2$ +Au plated: 60mΩ max.(at 1A 6VDC) AgSnO$_2$: 80mΩ max.(at 1A 6VDC)	
Contact material	AgSnO$_2$, AgNi	
Contact rating (Res. load)	10A 250VAC / 30VDC	8A 250VAC / 30VDC
Max. switching Voltage	277VAC	277VAC
Max. switching current	10A	8A
Max. switching power	2500VA	2000VA
Mechanical endurance	1 x 10^{7}OPS	
Electrical endurance	1A, 1B type: 1 x 10^{5}OPS (10A 250VAC, Resistive load., at 70˚C, 1.5s on 1.5s off) 1A +1B, 2A, 2B type: 3 x 10^{4}OPS (8A 250VAC, Resistive load., at 70˚C, 1.5s on 1.5s off)	

Notes:1) The data shown above are initial values.

CHARACTERISTICS

Insulation resistance		1000MΩ (at 500VDC)
Dielectric Strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Operate time (single side stable)		10ms max.
Release time (single side stable)		10ms max.
Set time (latching)		10ms max.
Reset time (latching)		10ms max.
Max. operate frequency (under rated load)		20 cycles /min
Temperature rise (at nomi. volt.)		50 K max.
Vibration resistance		10Hz to 55Hz 1.5mm DA
Shock resistance		98m/s^2
Humidity		5% to 85% RH
Ambient temperature		-40˚C to 70˚C
Termination	coil termination	PCB
	load termination	PCB
Unit weight		Approx. 6g
Construction		Plastic sealed, Flux proofed

Notes: The data shown above are initial values.

COIL

Type		Coil power	
		Sensitive	High sensitive
Single side stable	1A,1A+1B	Approx. 420mW	Approx. 200mW
	2A		Approx. 280mW
Single coils latching		Approx. 300mW	Approx. 200mW
Double coils latching		Approx. 420mW	Approx. 280mW

COIL DATA   at 23˚C

Single side stable

Nominal Voltage VDC	Pick-up Voltage VDC 1) max. 2)	Drop-out Voltage VDC 1) min. 2)	Coil Resistance x (1±10%)Ω		
			200mW	280mW	420mW
3	2.1	0.3	45	32.1	21.4
5	3.5	0.5	125	89.3	59.5
6	4.2	0.6	180	129	85.7
9	6.3	0.9	405	289	192.9
12	8.4	1.2	720	514	342.9
24	16.8	2.4	2880	2056	1371.4

Single coil latching

Nominal Voltage VDC	Set /Reset Voltage VDC 1) 2) max.	Pulse Duration ms min.	Coil Resistance x (1±10%)Ω	
			300mW	200mW
3	2.1	50	30	45
5	3.5	50	83.3	125
6	4.2	50	120	180
9	6.3	50	270	405
12	8.4	50	480	720
24	16.8	50	1920	2880

Notes:1) The data shown above are initial values.
2) Above driving voltage only apply to check relay normal function without load. When normal use with load, use (1~1.5)Ue for latching relay set/reset volage, use (1~1.3)Ue for set voltage and 0V for release voltage for monostable relay.

COIL DATA

at 23°C

Double coils latching

Nominal Voltage VDC	Set / Reset Voltage VDC max. [1]	Pulse Duration ms min.	Coil Resistance x (1±10%) Ω	
			420mW	280mW
3	2.1	50	21.4+21.4	32.1+32.1
5	3.5	50	59.5+59.5	89.3+89.3
6	4.2	50	85.7+85.7	129+129
9	6.3	50	192.9+192.9	289+289
12	8.4	50	342.9+342.9	514+514
24	16.8	50	1371.4+1371.4	2056+2056

Notes: 1) The data shown above are initial values.

SAFETY APPROVAL RATINGS

UL/CUL	1 Form A	AgNi	10A 250VAC 8A 30VDC 1/4HP 125VAC 1/3HP 250VAC
		AgSnO$_2$	10A 30VDC B300, R300 10A 250VAC 1/4 HP 125VAC 1/3 HP 250VAC
	2 Form A	AgSnO$_2$, AgNi	8A 250VAC/30VDC 1/4HP 125VAC 1/3HP 250VAC
		AgSnO$_2$	600W 125VAC B300, R300
	1 Form A+1 Form B	AgSnO$_2$, AgNi	8A 250VAC/30VDC 1/4HP 125VAC 1/3HP 250VAC
		AgSnO$_2$	B300, R300
VDE (No UL approval on Single side stable version)	1 Form A	AgNi	10A 250VAC (cosØ=1) 5A 250VAC (cosØ=0.4)
	2 Form A	AgNi	8A 250VAC (cosØ=1) 3.5A 250VAC(cosØ=0.4)
	1 Form A+1 Form B	AgNi	8A 250VAC (cosØ=1) 3.5A 250VAC (cosØ=0.4)

Notes: 1) All values unspecified are at room temperature; 2) Only typical loads are listed above.

ORDERING INFORMATION

HFE7 /	12	-1H	S	T	G	-L2	-R	(XXX)	(XXX)

Type

Coil voltage   3, 5, 6, 9, 12, 24VDC

Contact form [1]   **1H:** 1 Form A   **1D:** 1 Form B
2H: 2 Form A   **2D:** 2 Form B   **1HD:** 1A + 1B

Construction [2]   **S:** Plastic sealed   **Nil:** Flux proofed

Contact material [3]   **T:** AgSnO$_2$ **Nil:** AgNi

Contact plating   **G:** Gold plated   **Nil:** No gold plated

Sort   **L1:** 1 coil latching   **L2:** 2 coils latching   **Nil:** Single side stable

Polarity   **R:** Negative polarity   **Nil:** Positive polarity

Customer special code (Coil power) [4]   **(412):** Sensitive   **Nil:** High sensitive

Special code [5]   **XXX:** Customer special requirement   **Nil:** Standard

Notes: 1) 1H, 2H means that relay is on the "reset" status when delivery; 1D, 2D means that relay is on the "set" status when delivery. There are no UL approval on 1D, 2D version.
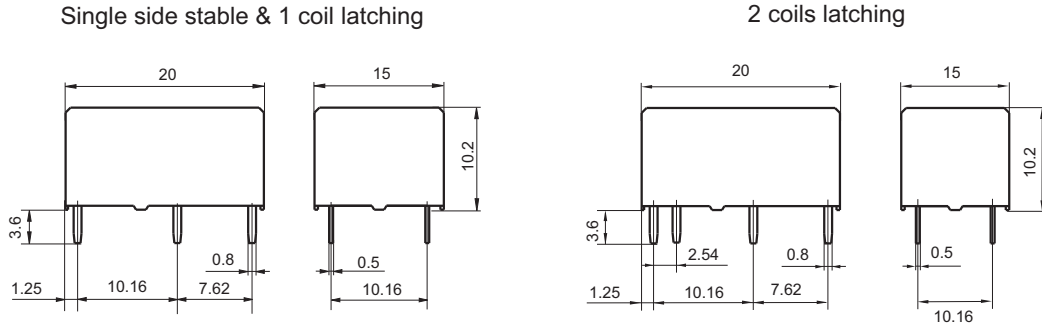2) Under the ambience with dangerous gas like H$_2$S, SO$_2$ or NO$_2$, plastic sealed type is recommended; Please test the relay in real applications. If the ambience allows, flux proofed type is preferentially recommended. Contact is recommended for suitable condition and specifications if water cleaning or surface process is involved in assembling relays on PCB.
3) For the application with inrush current conditions, such as lamp load, motor load, capacitance load, coil load, etc., we suggest use the flux proof and no golden plated AgSnO$_2$ contact version.
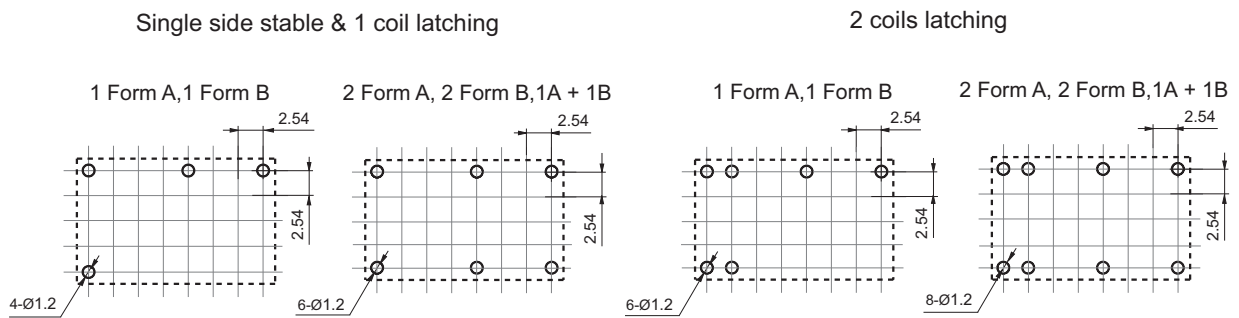4) We recommend to choose the sensitive version (same part number, but with special suffix (412)) if the higher coil activation is allowable; Please choose the sensitive version (same part number, but with special suffix (412)) if the relay to be used in the extreme environment or welded by wave soldering; Please check with HF's engineer before designing the relay to your application if there are some requirements' outside the specification we provided.
5) The customer special requirement express as special code after evaluating by Hongfa. e.g. (359) stands for Lamp load.
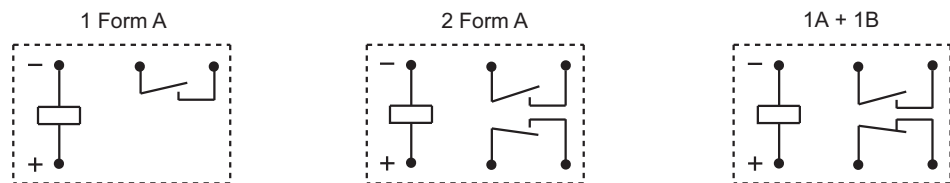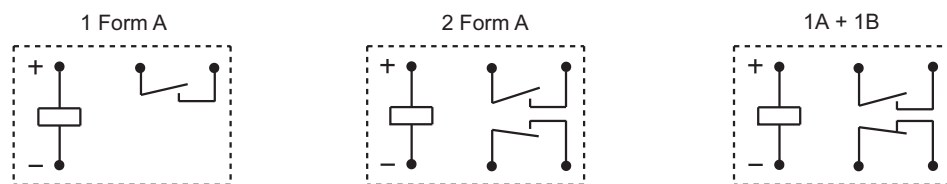
Outline Dimensions

Single side stable & 1 coil latching

2 coils latching

PCB Layout (Bottom view)

Single side stable & 1 coil latching

2 coils latching

1 Form A,1 Form B   2 Form A, 2 Form B,1A + 1B   1 Form A,1 Form B   2 Form A, 2 Form B,1A + 1B

Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension ＞1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension ＞5mm, tolerance should be ±0.4mm.
2) The tolerance without indicating for PCB layout is always ±0.1mm.
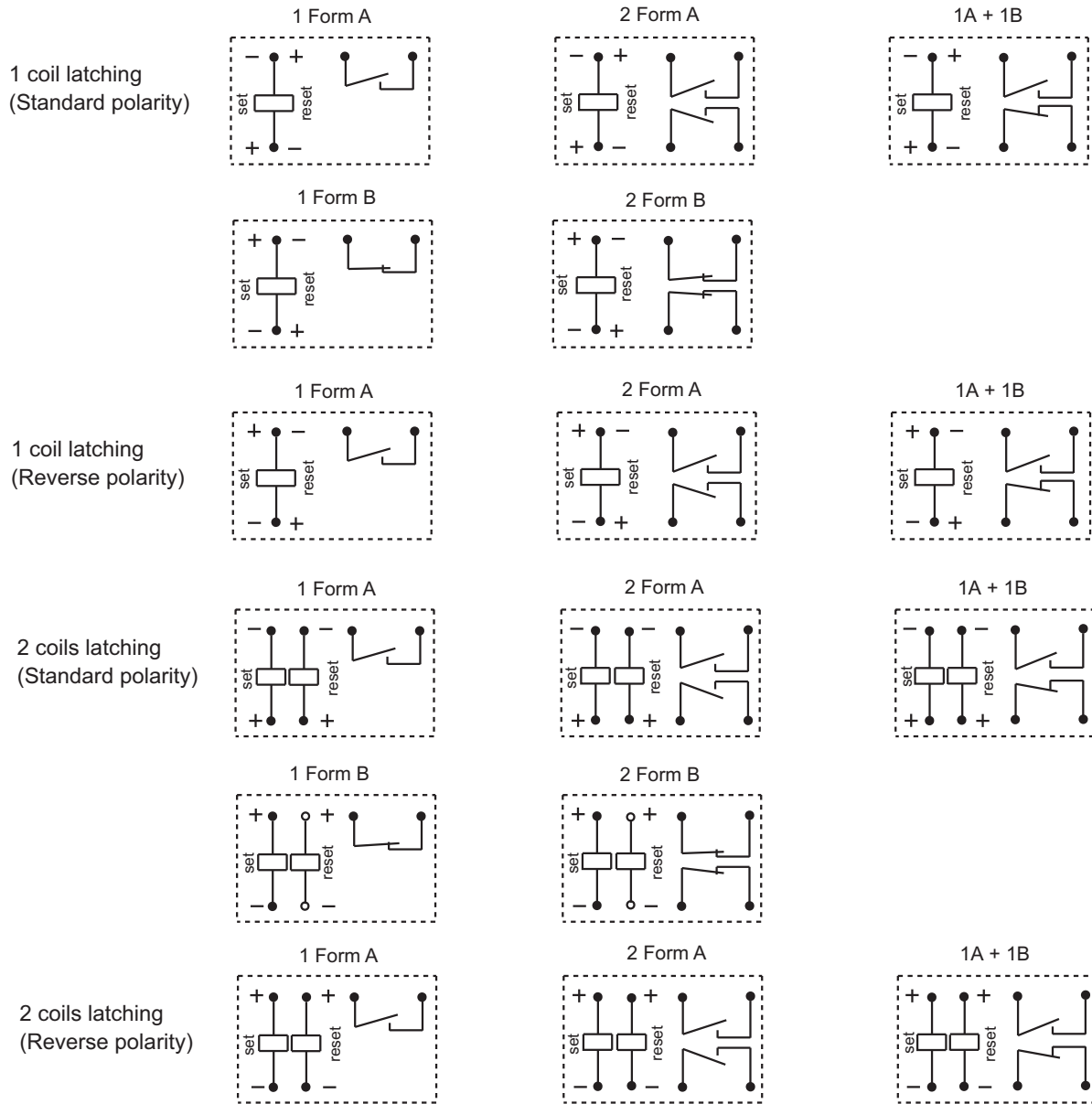3) The width of the gridding is 2.54mm.

Wiring Diagram (Bottom view)

Single side stable (Standard polarity)

1 Form A   2 Form A   1A + 1B

Single side stable (Reverse polarity)

1 Form A   2 Form A   1A + 1B

30

Wiring Diagram (Bottom view)

1 coil latching (Standard polarity) — 1 Form A, 2 Form A, 1A + 1B, 1 Form B, 2 Form B

1 coil latching (Reverse polarity) — 1 Form A, 2 Form A, 1A + 1B

2 coils latching (Standard polarity) — 1 Form A, 2 Form A, 1A + 1B, 1 Form B, 2 Form B

2 coils latching (Reverse polarity) — 1 Form A, 2 Form A, 1A + 1B

Notice:

1. Relay is on the "reset" or "set" status when being released from stock, with the consideration of shock risen from transit and relay mounting, relay would be changed to "set" or "reset" status, therefore, when application (connecting the power supply), please reset the relay to "set" or "reset" status on request.

2. In order to maintain "set" or "reset" status, energized voltage to coil should reach the rated voltage, impulse width should be 5 times more than "set" or "reset" time. Do not energize voltage to "set" coil and "reset" coil simultaneously. And also long energized time (more than 1 min) should be avoided.

3. As the relay component part's will shrink and deformed due to the high temperature impact, our products are forbidden to be used at the temperature outside our suggested working temperature range (-40℃ to 70℃) for long time ; If the wave soldering will be used, the operating parameters we will suggest are: Up limit of the pre-heating time: 120s; Up limit of the pre-heating temperature:120℃; Soldering temperatuer: 260℃±5℃; Soldering time（10±3）s; Besides our suggested parameters, please try to shorten the pre-heating time and the soldering time and try to lower the temperature for pre-heating and the soldering as you can; the manual soldering for such relay is more recommended.

Disclaimer

The specification is for reference only. Specifications subject to change without notice.

We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.