

SWITCHES, MECHANICAL 50 Ω
DC to 18 GHz Xtra long life up to 100 Million cycles



MODEL PREFIX	FREQUENCY (MHz)	INSERTION LOSS (dB)		ISOLATION (dB)		VSWR (:1)		DC CURRENT @+24 V (mA)		RF POWER (W)	
		Typ.	Max.	Typ.	Min.	Typ.	Max.	Typ.	Max.	Cold Switching (W) Max. Note 1	Hot Switching (W) Max. Note 2
	f_L - f_U										

SPDT DC to 18000 MHz

MSP2T-18XL (reflective)	DC-1000	0.10	0.15	100	85	1.05	1.10	80	115	10	0.1	1
	1000-8000	0.20	0.30	90	75	1.20	1.35					
	8000-12000	0.25	0.35	80	70	1.20	1.35					
	12000-18000	0.30	0.45	66	60	1.15	1.40					
MSP2TA-18XL (absorptive)	DC-1000	0.10	0.15	100	85	1.05	1.10	175	215	10	0.1	1
	1000-8000	0.15	0.30	90	70	1.20	1.30					
	8000-12000	0.25	0.40	80	70	1.20	1.35					
	12000-18000	0.30	0.50	66	60	1.25	1.40					

TRANSFER DC to 18000 MHz

MTS-18XL-B	DC-1000	0.10	0.15	100	85	1.05	1.10	175	215	10	0.1	1
	1000-8000	0.10	0.25	90	75	1.15	1.20					
	8000-12000	0.20	0.36	86	70	1.15	1.25					
	12000-18000	0.25	0.45	76	60	1.15	1.30					

1. To achieve specified life, hot switching Rf power must not exceed this level.
2. Degradation in life (min) typically 3 million switch cycles for hot switching at this power level.

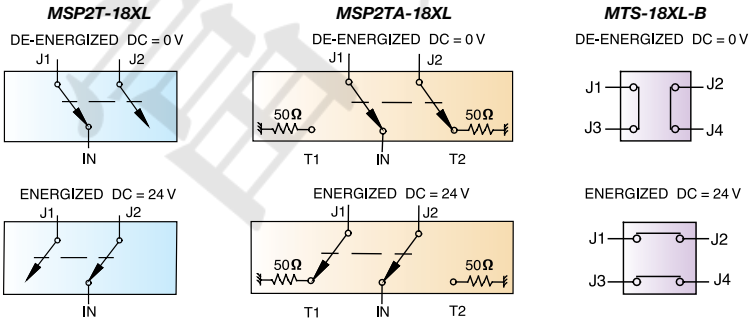
ADDITIONAL SPECIFICATIONS	
Operating Voltage Range	24V (nom) ±1V
Switching Time (typ.)	20ms
Life* (Min.)	1 year/10 million cycles
*tested at dBm RF power	

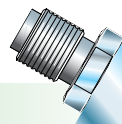
10 YEAR EXTENDED WARRANTY

10 Yr.
100 Million Cycles*

*10 year agreement required
See website for details

SWITCHING STATES





SWITCHES, PIN DIODE

50 Ω 1 to 3 GHz

ZMSW
Case JJ77ZSDR-230
Case CCC127ZSDR-425
Case GGG126

MODEL PREFIX	FREQUENCY (MHz)	TYPE	TTL DRIVER	INSERTION LOSS (dB)				IN-OUT ISOLATION (dB)						RISE TIME (μsec)	SWITCHING TIME (μsec)		CONTROL LOGIC	SUPPLY VOLTAGE (V)
	f_L - f_U			Low-band Typ. Max.		Upper band Typ. Max.		Frequency Band Typ. Min.		Typ. Min.		Typ. Min.		Typ.	Typ.	Max.		
				I_w		I_u		L	M	U								

SPDT/SP4T With TTL Drivers

ZSDR-230	10-3000	SPDT	•	1.3	1.9	1.8	2.7	60	40	40	28	35	22	—	2.0	4.0	G	+5
ZSDR-425	10-2500	SP4T	•	1.1	1.7	1.5	2.5	60	40	40	30	35	22	—	2.0	4.0	H	+5

SPST/SPDT Without TTL Drivers

ZMSW-1111	10-2500	SPST		1.1	1.9	1.9	2.7	50	45	35	28	28	22	2	—	4.0	I	—
ZMSW-1211	10-2500	SPDT		1.1	1.9	1.9	2.7	50	45	35	28	28	22	2	—	4.0	J	—

L = low range (f_L to $10f_L$)I w = low band (f_L to $f_U/2$)M = mid range ($10f_L$ to $f_U/2$)U = upper range ($f_U/2$ to f_U)

CONTROL LOGIC

G

SPDT Switch: ZSDR-230

TTL	RF Out port	
	1	2
Low	ON	OFF
High	OFF	ON

Low: 0 to 0.8 V
High: 2 to 5 V

H

SP4T Switch: ZSDR-425

		RF Out port			
TTL-1	TTL-2	1	2	3	4
High	Low	ON	OFF	OFF	OFF
High	High	OFF	ON	OFF	OFF
Low	High	OFF	OFF	ON	OFF
Low	Low	OFF	OFF	OFF	ON

Low: 0 to 0.8 V
High: 2 to 5 V

I

SPST Switch: ZMSW-1111

Control	Ports	RF Out port 2
1	2	
0	V	ON
V	0	OFF

V = 5 V

J

SPDT Switch ZMSW-1211

Control	Ports	RF Out port
1	2	
0	V	OFF
V	0	ON

V = 5 V

ZFAS
Case K18ZMAS
Case M21ZAS
Case M22

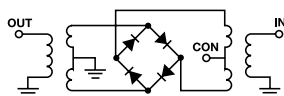
MODEL PREFIX	FREQUENCY (MHz)	INSERTION LOSS, dB (±20 mA)				MAX. INPUT PWR (dBm)	IN-OUT ISOLATION, dB (0 mA)						BI-PHASE $\bar{X}$ (±20 mA) Typ.			
	f_L - f_U	Mid-Band Typ. Max.		Total Range Typ. Max.			Typ. Min.		Typ. Min.		Typ. Min.		Δ AMP, dB m Total Range		Phase (deg) deviation from 180° m Total Range	
		f_L	f_U	f_L	f_U		L	M	U	L	M	U	L	M	L	M

BI-PHASE

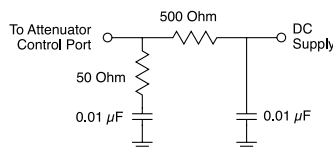
ZAS-3	1-200	DC-0.05	1.4	2.0	1.6	2.5	15	30	65	50	50	40	50	35	0.10	0.1	0.5	1.0
ZMAS-3	1-200	DC-0.05	1.4	2.0	1.6	2.5	15	30	65	50	50	40	50	35	0.10	0.1	0.5	1.0
ZAS-1	5-450	DC-0.05	3.5	4.0	3.5	4.7	20	30	65	50	55	40	35	25	0.10	0.1	0.5	1.2
ZMAS-1	5-450	DC-0.05	3.5	4.0	3.5	4.7	20	30	65	50	55	40	35	25	0.10	0.1	0.5	1.2
ZFAS-2000	100-2000	DC-0.5	4.2	6.5	5.4	7.5	19	25	30	22	—	—	26	20	0.30	0.4	5.0	8.0

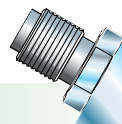
L = low range (f_L to $10f_L$)M = mid range ($10f_L$ to $f_U/2$)m = mid band ($2f_L$ to $f_U/2$)U = upper range ($f_U/2$ to f_U)

ELECTRICAL SCHEMATIC



SUGGESTED CONTROL PORT BIASING CONFIGURATION





SWITCHES, GaAs 50 Ω DC to 6 GHz Fast Switching



MODEL PREFIX	FREQUENCY (MHz)	ABSORPTIVE REFLECTIVE	INSERTION LOSS (dB)	1 dB COMPR. (dBm)	IN-OUT ISOLATION (dB)	RISE/FALL TIME (10% TO 90%), ns	SWITCHING TIME 50% OF CONTROL TO: 90% RF (Turn-on), ns 10% RF (Turn-off), ns	CONTROL LOGIC
	f_L - f_U		Typ. Max.	Typ. Min.	Typ. Min.	Typ. Max.	Typ. Max.	

SPDT With/Without TTL Drivers

ZFSW-2-46	DC-4600		•	1.0	2.8	17	—	50	28	2	—	—	—	—	K	
ZFSWA-2-46	DC-4600		•	0.9	2.6	17	—	50	25	2	—	—	—	—	K	
ZYSW-2-50DR	DC-5000		•	1.3	2.4	23	15	38	22	6	12	20	40	20	40	M
ZYSWA-2-50DR	DC-5000		•	1.4	2.1	20	13	31	19	6	12	20	40	20	40	M

SP4T With TTL Drivers

ZSWA-4-30DR	DC-3000	•	•	1.5	3.9	25	—	37	26	25	—	45	—	45	—	N
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SPST High Isolation Without TTL Drivers

ZFSWHA-1-20	DC-2000	•	•	1.3	1.7	19	—	65	58	3	5	7	10	3	10	L
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SPDT High Isolation With TTL Drivers

ZASW-2-50DR	DC-5000	•	•	1.8	4.5	20	—	82	46	5	15	10	20	10	20	M
ZASWA-2-50DR	DC-5000	•	•	1.8	4.5	20	—	82	46	5	15	10	20	10	20	M

SPDT With CMOS Drivers

ZX80-DR230	DC-3000	•	•	0.9	1.8	31	28	60	37	—	—	2000	—	2000	—	P
ZFSWA2-63DR	500-6000	•	•	1.4	1.7	24	—	50	43	25	—	35	—	35	—	M

CONTROL LOGIC

K

SPDT Switches: ZFSW, ZFSWA

Control Ports		RF outputs	
1	2	1	2
-V	0	ON	OFF
0	-V	OFF	ON

V = 5 to 8 V

L

SPST Switch: ZFSWHA

Control Ports		RF outputs
1	2	
-V	0	ON
0	-V	OFF

V = 5 to 8 V

M

SPDT Switch with Drivers: ZYSW, ZYSWA, ZASW, ZASWA

Control Port	RF outputs	
	1	2
Low	ON	OFF
High	OFF	ON

Low: 0 to 0.8 V
High: 2 to 5 V

N

SP4T Switch: ZSWA-4-30DR

Control Ports				RF outputs			
1	2	3	4	1	2	3	4
Low	High	High	High	ON	OFF	OFF	OFF
High	Low	High	High	OFF	ON	OFF	OFF
High	High	Low	High	OFF	OFF	ON	OFF
High	High	High	Low	OFF	OFF	OFF	ON

Low: 0 to 0.8 V
High: 2 to 5 V

P

SPDT Switch: ZX80-DR230

STATE	Control Input		RF Input/Output	
	Control 1	Control 2	RF1 to RF COMMON	RF2 to RF COMMON
1	Low	Low	OFF	OFF
2	Low	High	OFF	ON
3	High	Low	ON	OFF
4	High	High	N/A	N/A

General notes:

- When either of the RF1 or RF2 ports is closed (**ON** state), the closed port is connected to the RF Common port.
- When either of the RF1 or RF2 ports is open (**OFF** state), the open port is connected to an internal 50Ω termination.
- When either of the RF1 or RF2 ports is open (**OFF** state), all three RF ports are connected to an internal 50Ω termination.

