Plug-In

Switch

TOSW-425+

50Ω SP4T Pin Diode, Reflective TTL Driver, 10 to 2500 MHz

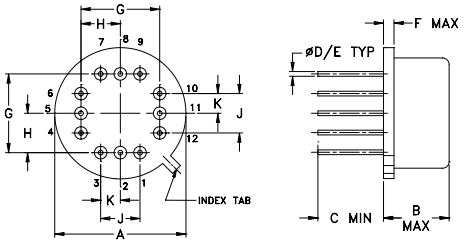
Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
Power	L(+20 dBm), M(+28 dBm), U(+30 dBm)
Supply V	+6V max.

Pin Connections

RF IN	8
RF OUT 1	4
RF OUT 2	6
RF OUT 3	10
RF OUT 4	12
TTL-1	2
TTL-2	3
+5V	1
GROUND	5,7,9,11
CASE GROUND	5,7,9,11

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F
.600	.250	.25	.016	.020	.04
15.24	6.35	6.35	0.41	0.51	1.02

G	H	J	K	wt
.400	.200	.200	.100	grams
10.16	5.08	5.08	2.54	4.0

Features

- wideband, 10 to 2500 MHz
- hermetic, compact TO-8 can

Applications

- military, hi-rel applications
- antenna switching
- satellite communication

Generic photo used for illustration purposes only

CASE STYLE: QQ96

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Switch Electrical Specifications

MODEL NO.	FREQ. (MHz)		INSERTION LOSS (dB)				IN-OUT ISOLATION (dB)					
			Low band lw		Upper band U		Frequency Band L		M		U	
	f_L	f_U	Typ.	Max.	Typ.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.
TOSW-425+	10	2500	1.1	1.7	1.5	2.5	60	40	40	30	35	22

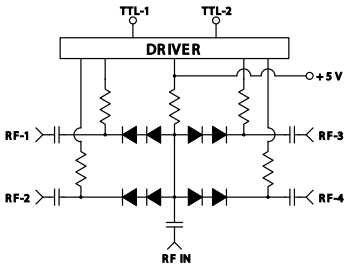
L= low range(f_L to 10 f_L)

M=mid range(10 f_L to f_U/2)
lw=low band (f_L to f_U/2)

U=upper range (f_U/2 to f_U)

Additional Specifications	
VSWR("ON" STATE)	1.3 Typ., 1.9 Max.
SWITCHING TIME (μSEC)	2.0 Typ., 4.0 Max.
SUPPLY VOLTAGE	+5V
SUPPLY CURRENT	10mA Max.
TTL INPUT HIGH THRESHOLD	2V Min.
TTL INPUT LOW THRESHOLD	0.8V Max.
1 dB COMPRESSION 10 to 100 MHz above 100 MHz	 +6 increasing to +19 dBm +19 dBm min.

Control Logic



TTL LOGIC		
	TTL-1	TTL-2
RF-1	High	Low
RF-2	High	High
RF-3	Low	High
RF-4	Low	Low

Notes

A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

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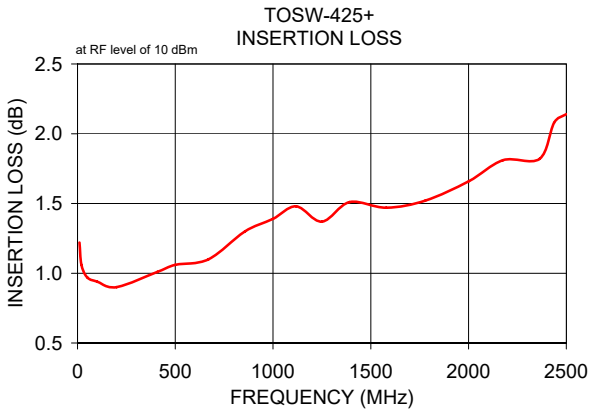
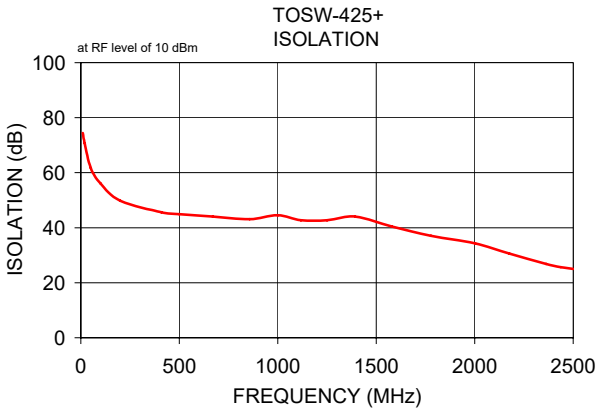
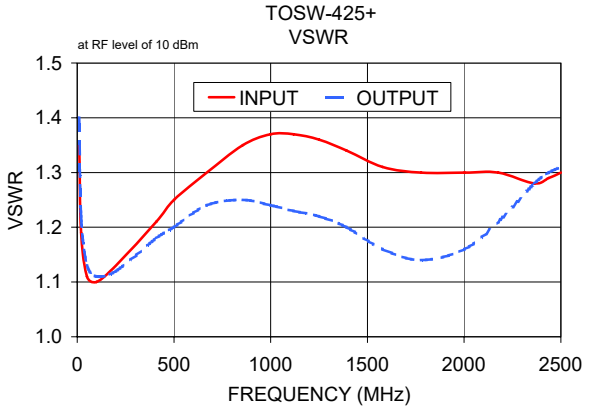
Typical Performance Data

FREQ. (MHz)	ON INSERTION LOSS (dB) IN-OUT		AMP. UNBALANCE (dB)		OFF ISOLATION (dB) IN-OUT		OFF ISOLATION DELTA (dB)		VSWR IN	VSWR OUT	OUT (RF1) OFF
	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	σ	$\bar{X}$	$\bar{X}$	$\bar{X}$
10.00	1.22	0.16	0.18	0.15	74.41	4.10	9.64	5.24	1.35	1.40	27.25
20.00	1.06	0.12	0.15	0.12	70.64	2.69	8.25	4.56	1.19	1.22	27.08
50.00	0.97	0.09	0.13	0.09	61.72	2.10	8.97	7.88	1.11	1.13	27.42
100.00	0.94	0.09	0.12	0.09	56.09	1.46	6.48	2.94	1.10	1.11	26.82
200.00	0.90	0.08	0.12	0.08	49.80	1.51	6.32	3.03	1.13	1.12	26.58
408.40	1.01	0.07	0.11	0.07	45.66	1.36	5.61	1.32	1.21	1.18	26.03
500.00	1.06	0.08	0.12	0.09	44.93	1.43	5.49	1.62	1.25	1.20	24.98
669.85	1.10	0.07	0.12	0.07	44.06	1.59	5.94	1.86	1.30	1.24	24.36
856.60	1.30	0.07	0.13	0.08	43.15	1.93	6.13	2.01	1.35	1.25	22.45
1000.00	1.39	0.05	0.11	0.07	44.52	3.69	8.35	2.97	1.37	1.24	20.59
1118.05	1.48	0.05	0.13	0.07	42.72	2.91	8.56	3.40	1.37	1.23	19.44
1250.00	1.37	0.06	0.13	0.06	42.75	2.61	10.05	4.95	1.36	1.22	19.15
1391.95	1.51	0.09	0.16	0.07	44.07	3.21	10.73	3.71	1.34	1.20	18.57
1578.70	1.47	0.05	0.15	0.05	40.41	2.62	9.61	3.27	1.31	1.16	17.15
1777.90	1.52	0.05	0.17	0.05	37.07	2.87	9.43	3.26	1.30	1.14	16.04
2002.00	1.66	0.12	0.20	0.08	34.27	3.55	9.08	1.82	1.30	1.16	13.88
2176.30	1.81	0.09	0.20	0.08	30.64	3.24	7.16	1.46	1.30	1.21	12.25
2363.05	1.82	0.07	0.19	0.04	26.86	2.95	5.63	1.07	1.28	1.28	9.41
2437.75	2.08	0.14	0.24	0.05	25.66	2.78	5.42	1.03	1.29	1.30	7.81
2500.00	2.14	0.16	0.25	0.05	25.03	2.28	5.15	1.27	1.30	1.31	7.10







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Switch SPDT , 50W

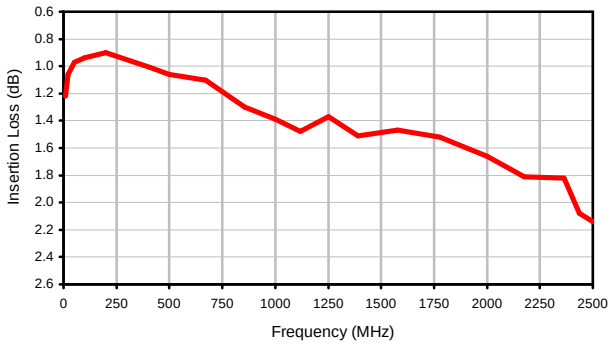
TOSW-425+

Typical Performance Data

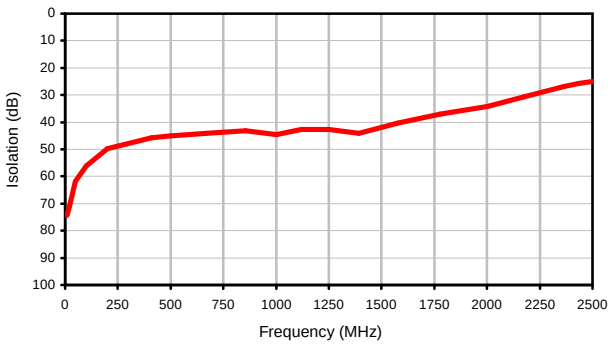
FREQUENCY (MHz)	INSERTION LOSS (dB) IN-OUT , "ON"	ISOLATION (dB) IN-OUT , "OFF"	VSWR (:1) IN	VSWR (:1) OUT , "ON"	VSWR (:1) OUT , "OFF"
10	1.22	74.41	1.35	1.40	27.25
20	1.06	70.64	1.19	1.22	27.08
50	0.97	61.72	1.11	1.13	27.42
100	0.94	56.09	1.10	1.11	26.82
200	0.90	49.80	1.13	1.12	26.58
408	1.01	45.66	1.21	1.18	26.03
500	1.06	44.93	1.25	1.20	24.98
670	1.10	44.06	1.30	1.24	24.36
857	1.30	43.15	1.35	1.25	22.45
1000	1.39	44.52	1.37	1.24	20.59
1118	1.48	42.72	1.37	1.23	19.44
1250	1.37	42.75	1.36	1.22	19.15
1392	1.51	44.07	1.34	1.20	18.57
1579	1.47	40.41	1.31	1.16	17.15
1778	1.52	37.07	1.30	1.14	16.04
2002	1.66	34.27	1.30	1.16	13.88
2176	1.81	30.64	1.30	1.21	12.25
2363	1.82	26.86	1.28	1.28	9.41
2438	2.08	25.66	1.29	1.30	7.81
2500	2.14	25.03	1.30	1.31	7.10

Typical Performance Curves

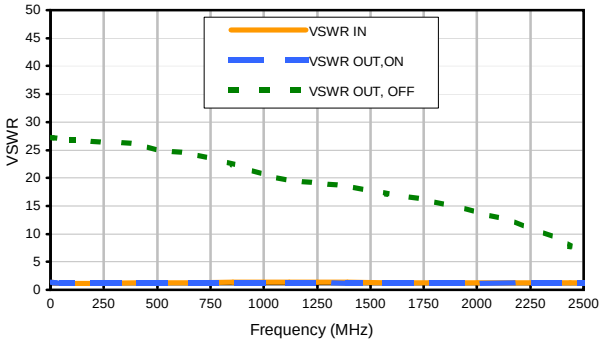
In-Out Insertion Loss, "ON"



In-Out Isolation, "OFF"



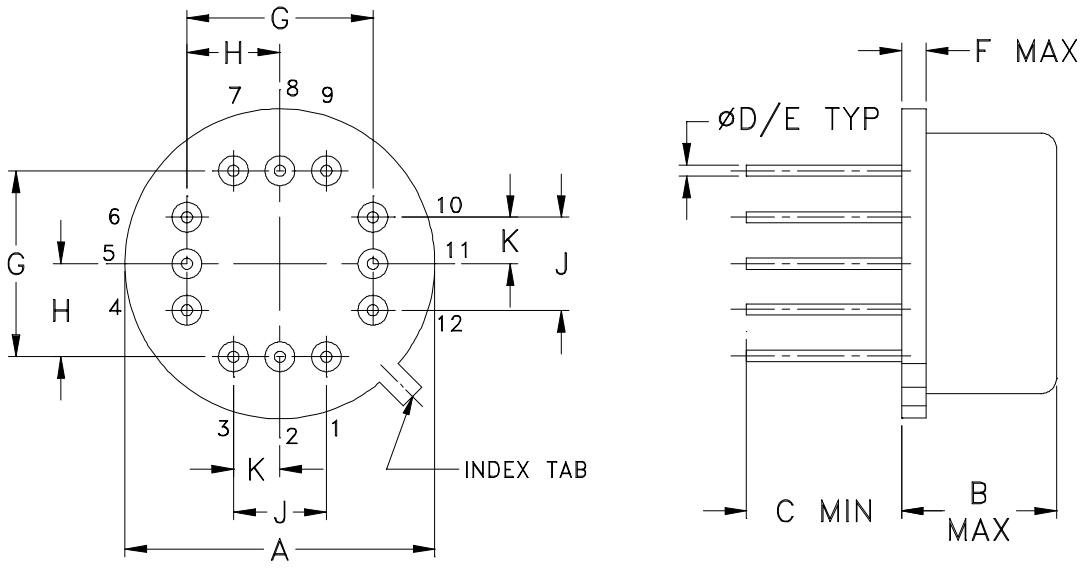
VSWR



Case Style QQ

QQ95
QQ96

Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	WT. GRAM
QQ95	.500 (12.70)	.250 (6.35)	.25 (6.35)	.016 (.41)	.020 (.51)	.04 (1.02)	.300 (7.62)	.150 (3.81)	.150 (3.81)	.075 (1.91)	3.5
QQ96	.600 (15.24)						.400 (10.16)	.200 (5.08)	.200 (5.08)	.100 (2.54)	4.0

Dimensions are in inches (mm). Tolerances: 2 Pl. ± .03; 3 Pl. ± .015

Notes:

1. Header material: Kovar.
   Pin material: Kovar.
   Cover material: Nickel.
2. Pin finish: Gold plate 25 µ inches (.64 microns) min.
3. For pin designations see specification data sheet.
4. Pin numbers do not apper on unit, for reference only.

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Environmental Specifications ENV36T1

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Thermal Shock	-55° to 100°C, 10 cycles	MIL-STD-202, Method 107, Condition A, except +100°C & 10 cycles
Constant Acceleration	5000g, Y1 axis	MIL-STD-883, Method 2001, Condition A, except Y1 axis only
Solderability	10X Magnification	J-STD-002, 95% Coverage
Resistance to Solder Heat	260°C for 10 seconds	MIL-STD-202, Method 210, Condition B
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215
Gross Leak	125°C Bubble Test	MIL-STD-202, Method 112, Condition D