



**AMERICAN MICROWAVE  
CORPORATION**

**SUMMARY  
TEST DATA  
ON  
WIDEBAND  
LOW VIDEO TRANSIENT  
LOW LOSS  
HIGH SPEED  
HIGH ISOLATION  
REFLECTIVE & ABSORPTIVE  
SPST PIN DIODE SWITCH/MODULATORS**

**NEW DESIGNS  
BY  
A. K. GORWARA**

**REPORTS PREPARED  
BY  
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**SEPTEMBER 10, 1995**

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SUMMARY TEST DATA  
COMPARISON CHARTS  
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## COMPARISON CHARTS OF NEW REFLECTIVE & ABSORPTIVE SPST PIN DIODE SWITCH/MODULATORS

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• VIDEO TRANSIENTS	PAGE 8
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### NEW AMC MODEL NUMBERS:

- **SWS-0518-1DR-HM**  
REFLECTIVE, 0.5 TO 18.0 GHz, SLIM-LINE MINIATURE, LOW LOSS, FAST, SPST PIN DIODE SWITCH
- **SWN-RRA-1DR-ECL-LVT**  
REFLECTIVE, 1.0 TO 18.0 GHz, LOW LOSS, LOW VIDEO TRANSIENTS(L/C), 8ns-ULTRA HIGH SPEED, ECL LOGIC SPST PIN DIODE SWITCH
- **SWN-1TDR-ARG-LVT**  
REFLECTIVE, 1.0 TO 18.0 GHz, VERY LOW VIDEO TRANSIENTS (L/C), 10ns-ULTRA HIGH SPEED, HIGH ISOLATION SPST PIN DIODE SWITCH
- **SWN-0118-1DT-250**  
ABSORPTIVE, 10 MHz TO 18 GHz, LOW LOSS, SPST PIN DIODE SWITCH
- **SWN-WSP-1DR-118-HPM**  
REFLECTIVE, 0.5 TO 18.0 GHz, MINIATURE, LOW LOSS SPST PIN DIODE SWITCH
- **SWN-WSP-1DR-118-HPM-LVT**  
REFLECTIVE, 1.0 TO 18.0 GHz, LOW VIDEO TRANSIENT SPST PIN DIODE SWITCH
- **SWN-118-1DR-HPX-LVT**  
REFLECTIVE, 2.0 TO 18.0 GHz, LOW VIDEO TRANSIENTS(R/C), VERY LOW LOSS, 50ns-HIGH SPEED, BALANCED "ON/OFF" SPST PIN DIODE SWITCH

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COMPARISON CHARTS  
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CONTENTS  
(CONTINUED)

- SWN-0518-1DR-12X-LVT  
REFLECTIVE, 0.5 TO 18.0 GHz, LOW LOSS, LOW VIDEO TRANSIENTS(R/C) SPST PIN DIODE SWITCH
- SWN-0518-1DR-12X  
REFLECTIVE, 0.5 TO 18.0 GHz, 8ns HIGH SPEED SPST PIN DIODE SWITCH
- SWN-AKG-1DR  
REFLECTIVE, 0.5 TO 18.0 GHz, 100 dB ISOLATION SPST PIN DIODE SWITCH
- SWN-AKG-1DR-12X  
REFLECTIVE, 0.5 TO 18.0 GHz, VERY HIGH SPEED, VERY HIGH ISOLATION SPST PIN DIODE SWITCH
- SWN-AKG-1DR-12X-LVT  
REFLECTIVE, 0.5 TO 18.0 GHz, HIGH SPEED, VERY HIGH ISOLATION, LOW VIDEO TRANSIENTS(R/C) SPST PIN DIODE SWITCH
- SWN-AKG-1DT  
ABSORPTIVE, 0.5 TO 18.0 GHz, 100 dB ISOLATION SPST PIN DIODE SWITCH
- SWN-AKG-1DT-12X  
ABSORPTIVE, 0.5 TO 18.0 GHz, 10ns-ULTRA HIGH SPEED, HIGH ISOLATION SPST PIN DIODE SWITCH
- SWN-AKG-1DT-12X-LVT  
ABSORPTIVE, 0.5 TO 18.0 GHz, HIGH SPEED, HIGH ISOLATION, LOW VIDEO TRANSIENTS(R/C) SPST PIN DIODE SWITCH

NOTES:

- Contact Factory for Available Options
- AMC Model Numbers are defined as follows:  

<u>SW</u>	<u>N</u>	<u>-</u>	<u>RRA</u>	<u>-</u>	<u>1</u>	<u>D</u>	<u>R</u>	<u>-</u>	<u>FCL</u>	<u>-</u>	<u>12X</u>	<u>-</u>	<u>LVT</u>
1	2		3		4	5	6		7		8		9

  1. Switch
  2. New
  3. Model Number or Frequency of Operation
  4. Number of Arms
  5. Integral Driver
  6. Reflective or Terminated(Absorptive)
  7. Control Logic (TTL is Standard)
  8. AMC internal design code
  9. Low Video Transient option

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COMPARISON CHARTS  
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INSERTION LOSS vs FREQUENCY

A COMPARISON OF SPST SWITCHES  
INSERTION LOSS vs FREQUENCY

FREQUENCY	0.1	0.2	0.3	0.5	0.8	1	2	4	6	8	10	12	14	16	18
SWS-0518-1DR-HM				1		1.2	1.5			2					2.8
SWN-RRR-1DR-ECL-LVT					1.33	0.76	0.89	0.89	1.19	1.43	1.44	1.44	1.98	2.11	2.33
SWN-1TDR-ARG-LVT									1.4	1.2	1.6	1.77	2.2		1.97
SWN-0118-1DT-250				0.55		0.78	1.23			1.45	2.16				3.17
SWN-WSP-1DR-HPM					0.49	0.41				0.69	0.89				1.18
SWN-WSP-1DR-HPM-LVT					0.49	0.41				0.69	0.89				1.18
SWN-118-1DR-HPX-LVT					0.5	0.39	0.51	0.6	0.89	1.3	1.22	1.63	1.76	2.01	2.01
SWN-0518-1DR-12X				0.68		0.43	0.59	0.74	0.98	1.22	1.63	1.76	2.01		2.08
SWN-0518-1DR-12X				0.44		0.34	0.55		0.92		1.2				2.08
SWN-AGK-1DR				0.7	0.6	0.55	0.7	1.2	1.1	1.2	1.5	2	2.25	2.3	2.73
SWN-AGK-1DR-12X				0.6		0.76	1.03	1.13	1.21	1.5	1.5	1.87	1.94	2.21	2.48
SWN-AGK-1DR-12X-LVT				0.66		0.78	1.03	1.06	1.39	1.78	1.9	2.11	2.27	2.66	
SWN-AGK-1DT				0.75	0.75	0.8	1.4	1.25	1.25	1.7	2.25	2.45	2.45	2.45	3.12
SWN-AGK-1DT-12X				0.64		0.76	0.91	1.09	1.38	2.17	1.98	1.98	2.24	2.98	2.76
SWN-AGK-1DT-12X-LVT				0.74		0.88	1.03	1.24	1.45	1.83	2.37	2.27	3.13	3.19	

A REVIEW OF NEW DESIGNS BY A. K. GORWARA

A AND B INSERTION LOSS MEASUREMENT IN dB  
C AND D FREQUENCY IN GHz

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ISOLATION vs FREQUENCY

A COMPARISON OF SPST SWITCHES  
ISOLATION vs FREQUENCY

FREQUENCY	0.1	0.2	0.3	0.5	0.8	1	2	4	6	8	10	12	14	16	18
SW3-0518-1DR-HM				60			70			85					80
SWN-RR-1DR-ECL-LVT						60	70	72	74	82	88	84	80	80	80
SWN-1TDR-ARG-LVT						53	64	96		98		89		82	68
SWN-0118-1DT-250	47			66			95	100	100	100		92			90
SWN-WSP-1DR-HPM				66		74				84		81			74
SWN-WSP-1DR-HPM-LVT				66		74				84		81			74
SWN-118-1DR-HPX	72	68	64	62	64	68	84	90	90	82	74	80	80	80	70
SWN-0518-1DR-12X-LVT	48	43	42	44	54	61	78	90	90	90	90	85	84	80	80
SWN-0518-1DR-12X	46			53			84			98		92			84
SWN-AGK-1DR	65			85			104	104		102			102		90
SWN-AGK-1DR-12X	90	90	88	100	100	100	95	90	90	90	88	88	84	80	80
SWN-AGK-1DR-12X-LVT	95	100	100	100	100	100	95	90	90	90	90	86	84	80	80
SWN-AGK-1DT	48			67			96	104		104	103		104		100
SWN-AGK-1DT-12X	14	61	64	70	80	83	95	90	90	90	90	88	84	80	80
SWN-AGK-1DT-12X-LVT	40	38	40	46	54	60	76	90	90	90	88	84	80	80	80

A REVIEW OF NEW DESIGNS BY A. K. GORWARA

Y AXIS: MEASUREMENTS OF ISOLATION IN dB  
X AXIS: FREQUENCY IN GHz

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COMPARISON CHARTS  
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RETURN LOSS vs FREQUENCY

A COMPARISON OF SPST SWITCHES  
RETURN LOSS vs FREQUENCY

FREQUENCY	0.1	0.2	0.3	0.5	0.8	1	2	4	6	8	10	12	14	16	18
SWS-0518-1DR-HM															9.54
SWN-RRR-1DR-ECL-LVT						8.87	13.86	15.79	30.24	16.9	15.4	22.76	15.86	27.62	16.71
SWN-1TDR-ARG-LVT															19.17
SWN-0118-1DT-250				26.4			16.92	15.65		20.82		20.25			21.06
SWN-WSP-1DR-HPM						22.9	19.7			19.5		17.75			31.95
SWN-WSP-1DR-HPM-LVT						22.9	19.7			19.5		17.75			31.95
SWN-118-1DR-HPX-LVT						41.89	23.23	21.28	24.34	14.37	10.42	16.7	19.86	18.5	23.32
SWN-0518-1DR-12X-LVT				14.53			23.77	25.21	24.75	20.44	24.93	12.77	15.94	17.4	19.16
SWN-0518-1DR-12X				14.1		22.6		27.28		14.93		17.74			12.02
SWN-AGK-1DR															18.82
SWN-AGK-1DR-12X				17.63			16.31	16.24	15.11	27.24	23.01	16.01	24.01	26.18	18.44
SWN-AGK-1DR-12X-LVT				17.66			17.98	20.45	21.2	16.59	17.4	14.54	15.26	23.01	25.66
SWN-AGK-1DT															17.29
SWN-AGK-1DT-12X				16.94			17.72	30.69	24.25	19.53	12.56	17.86	25.14	12.26	21.15
SWN-AGK-1DT-12X-LVT				14.63			17.91	26.07	31.53	28.33	22.44	16.48	23.48	12.5	19.85

A REVIEW OF NEW DESIGNS BY A. K. GORWARA

X AXIS MEASUREMENT OF RETURN LOSS IN dB  
Y AXIS FREQUENCY IN GHz

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### SWITCHING SPEED

### A COMPARISON OF SPST SWITCHES SWITCHING SPEED

SWITCHING SPEED	RISE	FALL	ON	OFF
SWS-0518-1DR-HM	10	10	50	50
SWN-RRR-1DR-ECL-LVT	2	2	7	9
SWN-1TDR-ARG-LVT	3	3	6	6
SWN-0118-1DT-250	20	12	60	40
SWN-WSP-1DR-HPM	6	3	40	20
SWN-WSP-1DR-HPM-LVT	8	8	60	55
SWN-118-1DR-HPX-LVT	10	8	40	35
SWN-0518-1DR-12X-LVT	10	12	25	45
SWN-O518-1DR-12X	2	2	10	10
SWN-AGK-1DR	3	3	20	10
SWN-AGK-1DR-12X	2	2	12	10
SWN-AGK-1DR-12X-LVT	3	5	25	35
SWN-AGK-1DT	8	3	20	10
SWN-AGK-1DT-12X	5	3	15	10
SWN-AGK-1DT-12X-LVT	20	5	35	25

X AXIS: MEASUREMENT OF SWITCHING SPEED IN NANoseconds  
A REVIEW OF NEW DESIGNS BY A. K. GORWARA

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VIDEO TRANSIENTS

A COMPARISON OF SPST SWITCHES  
VIDEO TRANSIENTS

BANDWIDTH	20	100	300
SWS-0518-1DR-HM	50		
SWN-PPA-1DR-ECL-LVT	100		400
SWN-1TDR-ARG-LVT			3
SWN-0118-1DT-250			1,400
SWN-WSP-1DR-HPM			600
SWN-WSP-1DR-HPM-LVT			50
SWN-118-1DR-HPX-LVT	85	125	175
SWN-0518-1DR-12X-LVT			400
SWN-0518-1DR-12X			620
SWN-AGK-1DR	*	*	*
SWN-AGK-1DR-12X			1,800
SWN-AGK-1DR-12X-LVT	85		315
SWN-AGK-1DT			1,750
SWN-AGK-1DT-12X			2,150
SWN-AGK-1DT-12X-LVT	70		450

A REVIEW OF NEW DESIGNS BY A. K. GORWARA  
X AXIS: MEASUREMENTS IN MILLIVOLTS(mV), PEAK TO PEAK  
Y AXIS: BANDWIDTH IN MHZ  
\*NO DATA AVAILABLE ON AKG-1D OR 1DT\*

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MECHANICAL OUTLINES

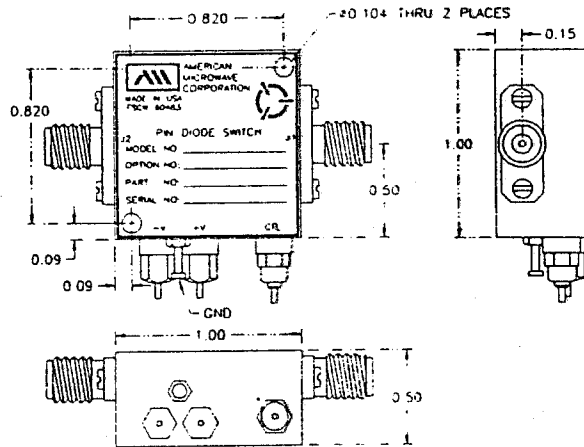


FIGURE 1. DC Power Supply :  $\pm 5\text{vdc}$  @  $\pm 60\text{mA}$  Max.

- SWN-118-1DR-IIPX-LVT
- SWN-0518-1DR-12X-LVT
- SWN-0518-1DR-12X
- SWN-AKG-1DR
- SWN-AKG-1DR-12X
- SWN-AKG-1DR-12X-LVT
- SWN-AKG-1DT
- SWN-AKG-1DT-12X
- SWN-AKG-1DT-12X-LVT
- SWN-0118-1DT-250

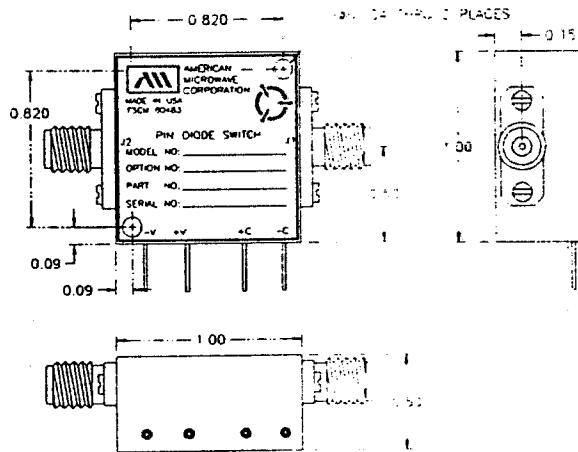


FIGURE 2. DC Power Supply :  $\pm 5\text{vdc}$  @  $\pm 80\text{mA}$  Max.

- SWN-RRA-1DR-ECL-LVT

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MECHANICAL OUTLINES

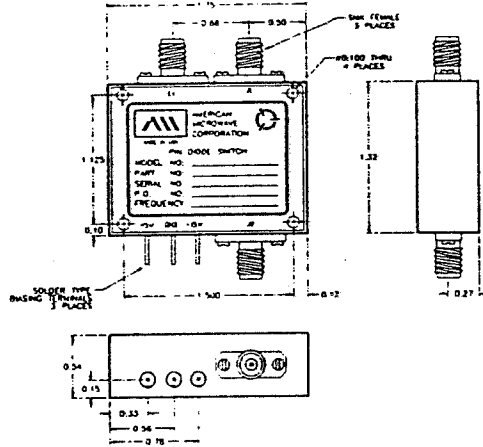


FIGURE 3. DC Power Supply :  $\pm 5\text{vdc}$  @  $\pm 60\text{mA}$  Max.  
● SWN-1TDR-ARG-LVT

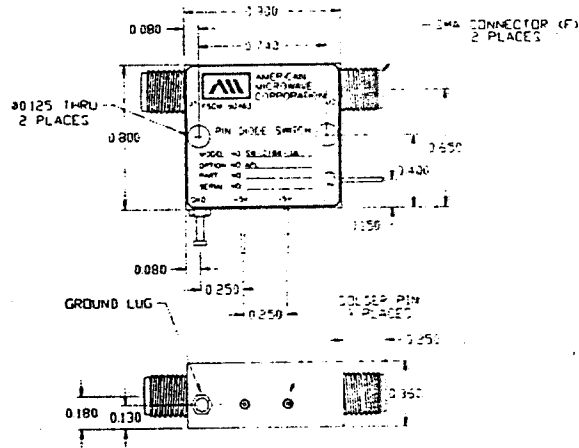


FIGURE 4. DC Power Supply :  $\pm 5\text{vdc}$  @  $\pm 60\text{mA}$  Max.  
● SWN-WSP-1DR-118-IIPM  
● SWN-WSP-1DR-118-IIPM-LVT

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### MECHANICAL OUTLINES

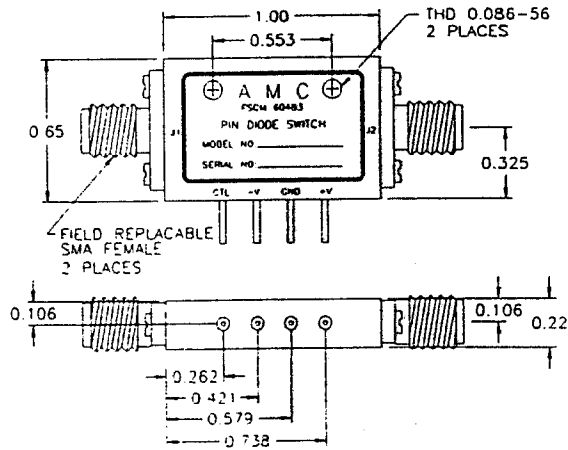


FIGURE 5. DC Power Supply :  $\pm 5\text{vdc}$  @  $\pm 60\text{mA}$  Max.  
● SWS-0518-1DR-IIM

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SUNSTAR 商斯达实业集团是集研发、生产、工程、销售、代理经销、技术咨询、信息服务等为一体的高科技企业，是专业高科技电子产品生产厂家，是具有 10 多年历史的专业电子元器件供应商，是中国最早和最大的仓储式连锁规模经营大型综合电子零部件代理分销商之一，是一家专业代理和分销世界各大品牌 IC 芯片和电子元器件的连锁经营综合性国际公司，专业经营进口、国产名厂名牌电子元件，型号、种类齐全。在香港、北京、深圳、上海、西安、成都等全国主要电子市场设有直属分公司和产品展示展销窗口门市部专卖店及代理分销商，已在全国范围内建成强大统一的供货和代理分销网络。我们专业代理经销、开发生产电子元器件、集成电路、传感器、微波光电元器件、工控机/DOC/DOM 电子盘、专用电路、单片机开发、MCU/DSP/ARM/FPGA 软件硬件、二极管、三极管、模块等，是您可靠的一站式现货配套供应商、方案提供商、部件功能模块开发配套商。商斯达实业公司拥有庞大的资料库，有数位毕业于著名高校——有中国电子工业摇篮之称的西安电子科技大学（西军电）并长期从事国防尖端科技研究的高级工程师为您精挑细选、量身订做各种高科技电子元器件，并解决各种技术问题。

微波光电部专业代理经销高频、微波、光纤、光电元器件、组件、部件、模块、整机；电磁兼容元器件、材料、设备；微波 CAD、EDA 软件、开发测试仿真工具；微波、光纤仪器仪表。欢迎国外高科技微波、光纤厂商将优秀产品介绍到中国、共同开拓市场。长期大量现货专业批发高频、微波、卫星、光纤、电视、CATV 器件：晶振、VCO、连接器、PIN 开关、变容二极管、开关二极管、低噪晶体管、功率电阻及电容、放大器、功率管、MMIC、混频器、耦合器、功分器、振荡器、合成器、衰减器、滤波器、隔离器、环行器、移相器、调制解调器；光电子器件和组件：红外发射管、红外接收管、光电开关、光敏管、发光二极管和发光二极管组件、半导体激光二极管和激光器组件、光电探测器和光接收组件、光发射接收模块、光纤激光器和光放大器、光调制器、光开关、DWDM 用光发射和接收器件、用户接入系统光收发器件与模块、光纤连接器、光纤跳线/尾纤、光衰减器、光纤适配器、光隔离器、光耦合器、光环行器、光复用器/转换器；无线收发芯片和模组、蓝牙芯片和模组。

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