

REPLACEMENT PART REFERENCE GUIDE, M3SWA-2-50DR+ AN-80-013

ORIGINAL PART: M3SWA-2-50DR+
 REPLACEMENT PART: M3SWA-2-50DRA+



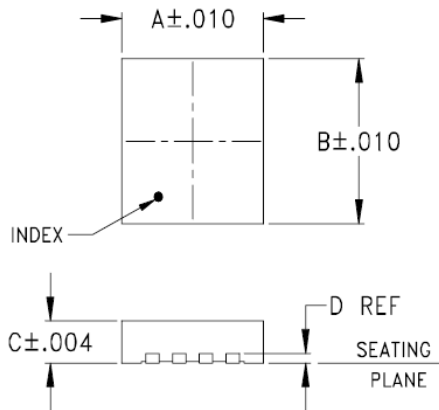
Replacement Part has been judged by Mini-Circuits Engineering as a close replacement to Original Part^a

MECHANICAL DIMENSIONS & PCB LAND PATTERN

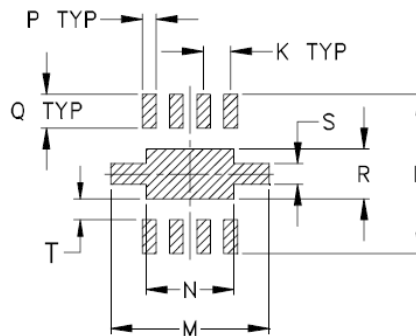
ORIGINAL PART: M3SWA-2-50DR+	REPLACEMENT PART: M3SWA-2-50DRA+
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Case Style DL805 (No Change)

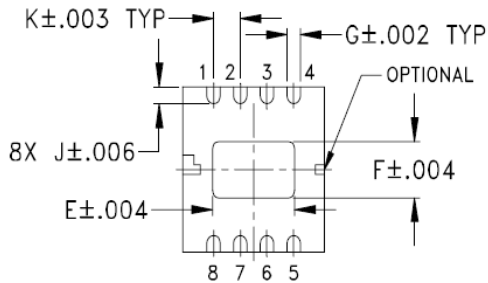
Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002



Marking

3SWA

Marking

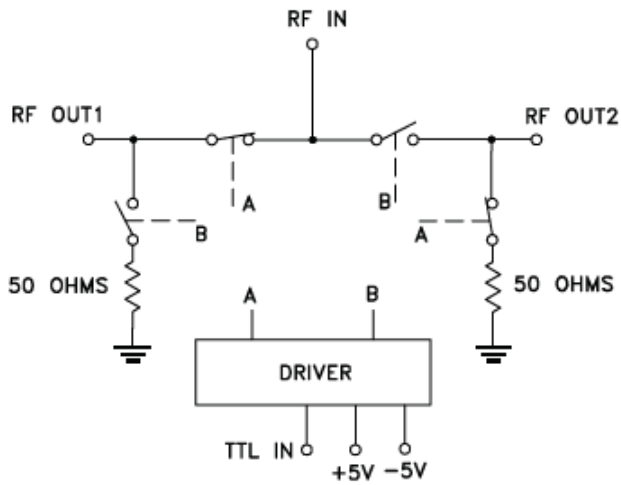
3SWA

Notes:
 a. Suitability for model replacement within a particular system must be determined by and is solely the responsibility of the customer based on, among other things, electrical performance criteria, stimulus conditions, application, compatibility with other components and environmental conditions and stresses.

ORIGINAL PART: M3SWA-2-50DR+

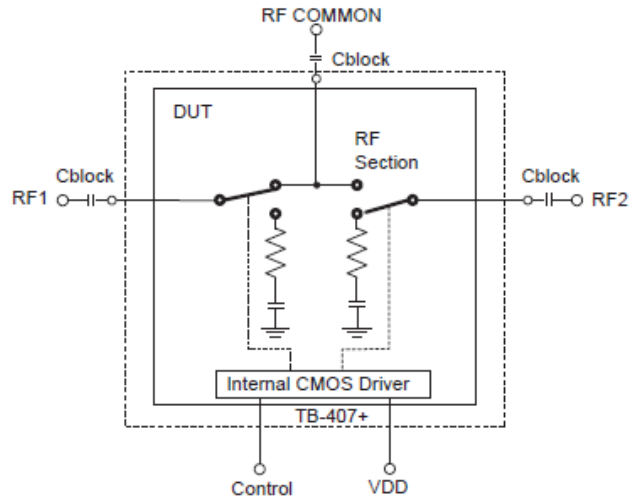
REPLACEMENT PART: M3SWA-2-50DRA+

Application Circuit



All RF connections must be DC blocked or held at 0V DC.

Application Circuit



Needs external blocking Capacitors on all RF ports

(Suggested value: 47 pF)

Pin Connections

Function	Pin
RF IN	6
RF OUT 1	1
RF OUT 2	4
TTL IN	2
+5V	5
-5V	7
TTL GND	3
GND	8
GND	PADDLE

Pin Connections

Function	Pin
RF IN	6
RF OUT 1	1
RF OUT 2	4
CMOS IN (Note 1)	2
+5V	5
No Connection (Note 2)	7
CMOS GND (Note 1)	3
GND	8
GND	PADDLE

Notes: Pin Connections are same as in original part, except Pin 7 has no internal connection

- 1) Driver is CMOS compatible instead of TTL
- 2) In replacement situations, -5V can be applied to Pin 7 with no impact on performance

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CONCLUSIONS:

1) FORM-FIT-FUNCTION COMPATIBLE^a:

Replacement part is Form, Fit compatible. Following is a summary of changes/improvements:

Typical performance: See Paragraphs 2 and 3

Min/Max Specifications seen below,

Parameter	Original Part (M3SWA-2-50DR+)	Replacement Part (M3SWA-2-50DRA+)
Positive Power Supply (V _{DD})	+4.8 to +5.25V over -40 to 85°C +4.9to +5.25V over -55 to 100°C	+3V to +5.0V
Negative Power Supply(V _{SS})	-5.25V to -4.8V over -40 to 85°C -5.25V to -4.9V over -55 to 100°C	Not Required
Control Input Low Voltage	0V Min, 0.8 Max	0V Min, 0.5 Max
Control Input High Voltage	2 Min, 5 Max	0.7V _{DD} to V _{DD}
Positive Supply Current (I _{DD}) Negative Supply Current (I _{SS})	3 mA typ. 9 mA max 5mA typ., 9 mA max	50 µA typ. , 200 µA max ---
Control Current	0.6mA, 5 mA max	0.2uA typ., 10 uA max
Rise/Fall Time (10 to 90%)	5ns typ. 10ns Max	16 ns Typ.
Switching Time (turn on/off) 50% Control to 90% RF/10% RF	10ns typ. 15ns Max	29 ns Typ.
P1dB (dBm) at V _{DD} =5V typ. Over DC-100 MHz 100-1000 MHz 1000-2000 MHz 2000-4500 MHz	20 drops to 17 at 10 MHz 25 25 20	-- 23 over 500-1000 MHz 30 26
ESD HBM	Class 1C (1000 to <2000V)	Class 1A (250 to < 500V)
Absorptive	Yes	Yes, from 500-4500 MHz (See Paragraph 3)
DC Blocking Caps on RF ports	All RF connections must be DC blocked or held at 0V DC.	Needs external blocking Capacitors on all RF ports (Suggested value: 47 pF)

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**2) PERFORMANCE COMPARISON CURVES: Original Part (Vdd = 5 & -5V, Vctrl = 0.8 & 2V)
Replacement Part (Vdd = 5V, Vctrl = 0 & 3.7V)**

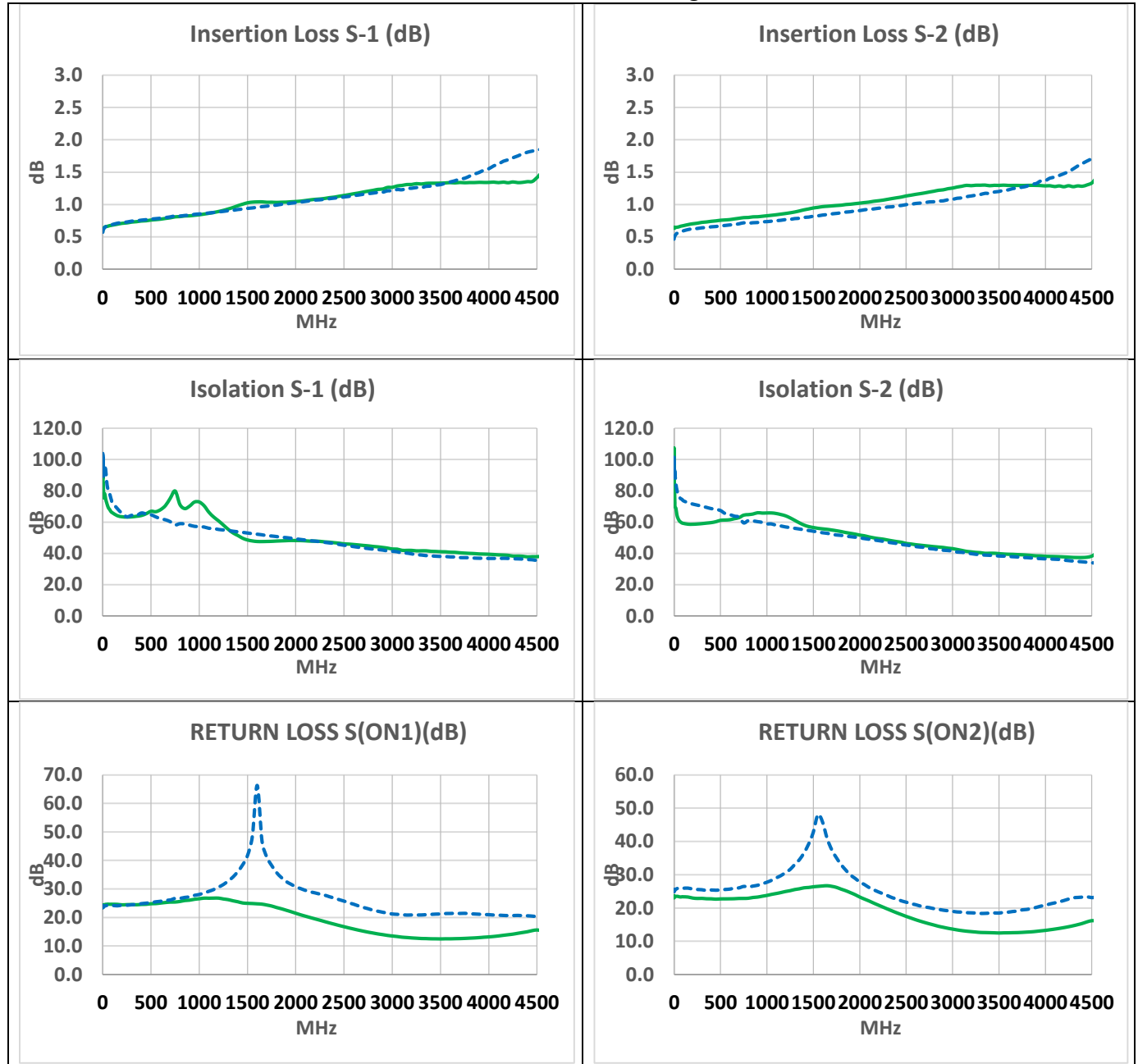
M3SWA-2-50DRA+	Freq(MHz)		M3SWA-2-50DRA+ 5 Units @Vdd = 5V @Vctrl = 0V & 3.7V			M3WA-2-50DR+ @Vdd= -5V & 5V @Vctrl = 0.8V & 2V		
	From	To	Min.	Avg.	Max.	Min.	Avg.	Max.
INSERTION LOSS S-1 (dB)	10	10	0.6	0.6	0.6	0.5	0.6	0.6
	100	100	0.7	0.7	0.7	0.6	0.6	0.7
	1000	1000	0.8	0.8	0.8	0.7	0.8	0.9
	2000	2000	1.0	1.0	1.1	0.9	1.0	1.0
	4500	4500	1.4	1.5	1.6	1.8	1.8	1.8
INSERTION LOSS S-2 (dB)	10	10	0.6	0.6	0.6	0.5	0.5	0.6
	100	100	0.6	0.6	0.7	0.6	0.6	0.7
	1000	1000	0.8	0.8	0.8	0.7	0.8	0.8
	2000	2000	1.0	1.0	1.0	0.9	0.9	1.0
	4500	4500	1.3	1.4	1.4	1.7	1.7	1.8
ISOLATION S-1 (dB)	10	10	75.4	76.4	77.1	88.7	89.8	90.8
	100	100	65.9	66.0	66.2	69.5	71.9	72.7
	1000	1000	55.5	59.1	72.8	51.2	58.4	62.0
	2000	2000	42.1	43.5	48.2	46.8	50.4	52.0
	4500	4500	27.2	30.4	37.9	34.8	35.7	38.2
ISOLATION S-2 (dB)	10	10	69.9	70.3	70.9	90.9	93.7	95.9
	100	100	59.3	59.3	59.4	71.4	77.9	81.7
	1000	1000	61.0	62.6	65.9	54.2	59.9	62.6
	2000	2000	44.6	46.4	51.8	49.6	50.6	51.2
	4500	4500	27.7	30.9	38.3	33.7	34.1	35.2
RETURN LOSS S(ON1) (dB)	10	10	24.5	24.5	24.6	23.7	24.6	25.8
	100	100	24.6	24.7	24.7	24.2	25.2	26.5
	1000	1000	26.6	26.9	27.5	28.1	29.9	32.3
	2000	2000	21.5	22.1	23.4	25.9	27.7	30.8
	4500	4500	15.6	16.9	17.9	19.8	20.7	21.2
RETURN LOSS S(ON2) (dB)	10	10	23.5	24.0	24.3	24.1	25.1	26.2
	100	100	23.3	23.9	24.1	24.4	25.5	26.6
	1000	1000	23.7	24.3	24.7	26.0	27.3	28.7
	2000	2000	23.0	23.5	24.0	25.8	26.6	27.9
	4500	4500	16.2	17.4	18.3	21.5	22.2	23.1
RETURN LOSS S(ON) (dB)	10	10	23.5	24.0	24.3	23.7	24.6	25.8
	100	100	23.3	23.9	24.1	24.2	25.2	26.5
	1000	1000	23.7	24.3	24.7	26.0	27.3	28.7
	2000	2000	21.5	22.1	23.4	25.8	26.6	27.9
	4500	4500	15.6	16.9	17.9	19.8	20.7	21.2
RETURN LOSS 1(ON) (dB)	10	10	24.4	24.4	24.4	23.9	24.8	26.0
	100	100	24.5	24.6	24.6	24.5	25.4	26.7
	1000	1000	21.8	21.9	21.9	21.7	22.3	23.1
	2000	2000	17.9	18.1	18.4	17.8	18.1	18.3
	4500	4500	20.5	22.1	24.4	16.1	16.7	17.8
RETURN LOSS 2(ON) (dB)	10	10	23.2	23.8	24.0	24.3	25.4	26.4
	100	100	23.1	23.6	23.8	24.9	26.1	27.1
	1000	1000	22.6	23.1	23.3	24.5	25.6	26.6
	2000	2000	17.6	17.9	18.1	18.8	19.1	19.3
	4500	4500	23.4	25.4	28.1	18.1	18.6	19.5
RETURN LOSS 1(OFF) (dB)	10	10	0.1	0.1	0.1	24.6	26.2	28.7
	100	100	2.2	2.2	2.2	24.4	25.9	28.2
	1000	1000	20.8	21.2	21.5	27.6	29.5	32.8
	2000	2000	20.4	21.0	21.7	26.6	28.1	28.8
	4500	4500	13.3	13.7	14.2	18.6	19.0	19.6
RETURN LOSS 2(OFF) (dB)	10	10	0.1	0.1	0.1	24.7	25.9	27.9
	100	100	2.1	2.1	2.1	24.5	25.6	27.4
	1000	1000	20.3	20.5	20.9	24.9	25.9	27.7
	2000	2000	22.7	23.3	23.7	27.9	28.8	29.1
	4500	4500	14.3	14.9	15.4	17.5	17.7	18.2

Notes:
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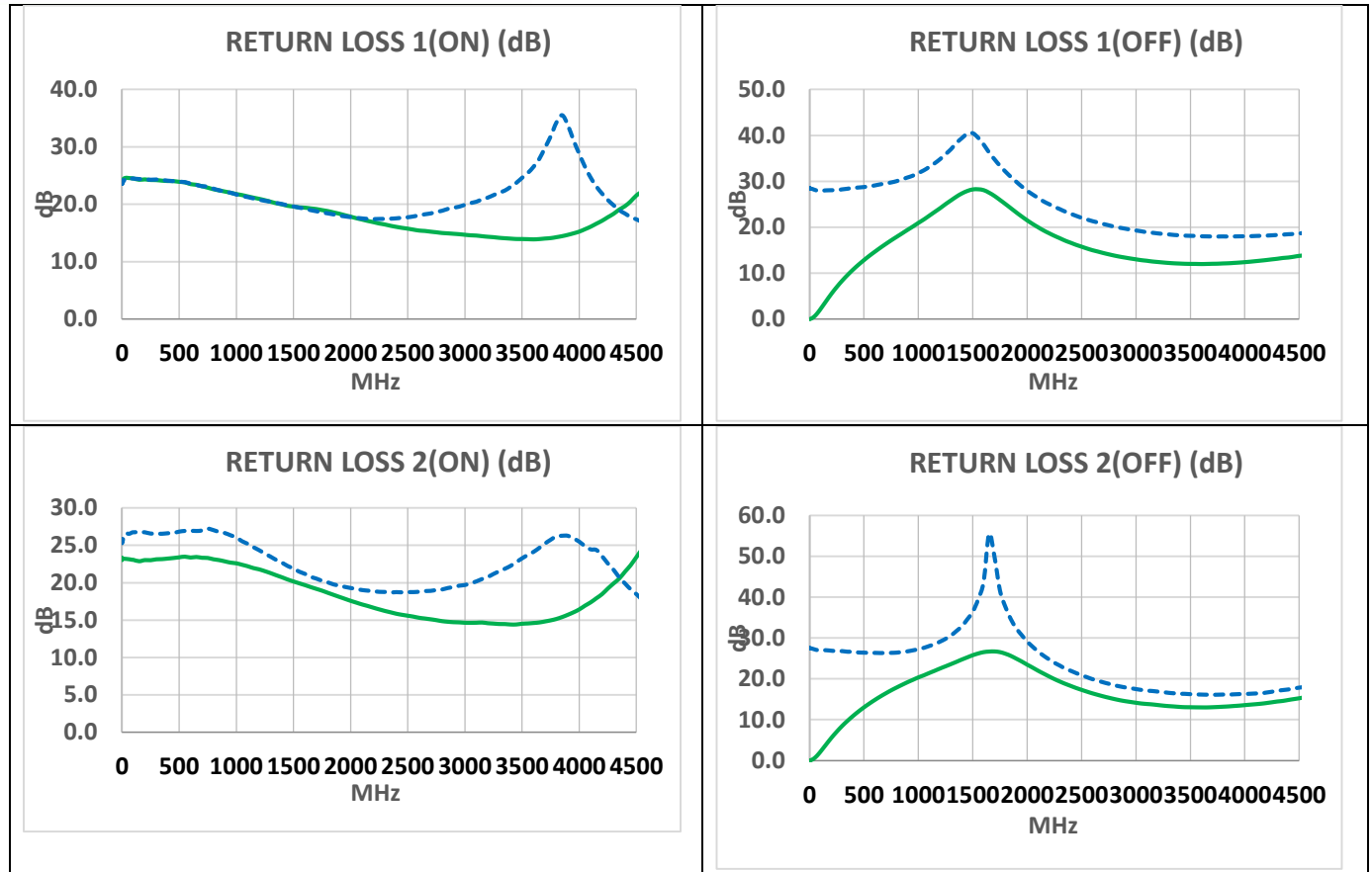
**3) PERFORMANCE COMPARISON CURVES: Original Part (Vdd = 5 & -5V, Vctrl = 0.8 & 2V)
Replacement Part (Vdd = 5V, Vctrl = 0 & 3.7V)**

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Data of Replacement Part
Data of Original Part



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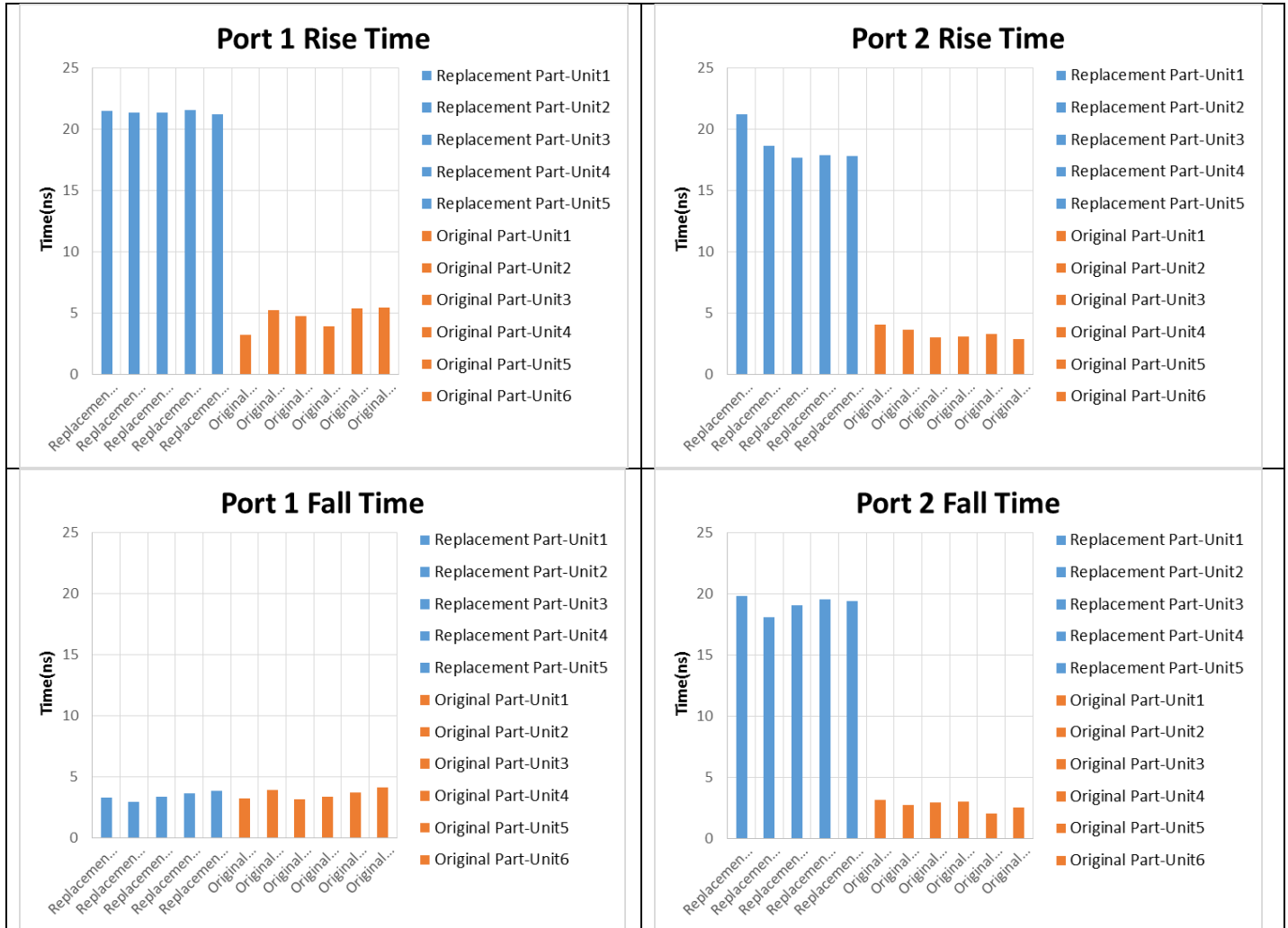
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1) SWITCHING/RISE/FALL TIME COMPARISON (Original Part (Vdd = 5 & -5V, Vctrl = 0 & 3.7V) Replacement Part (Vdd =5V, Vctrl = 0 & 3.7V)

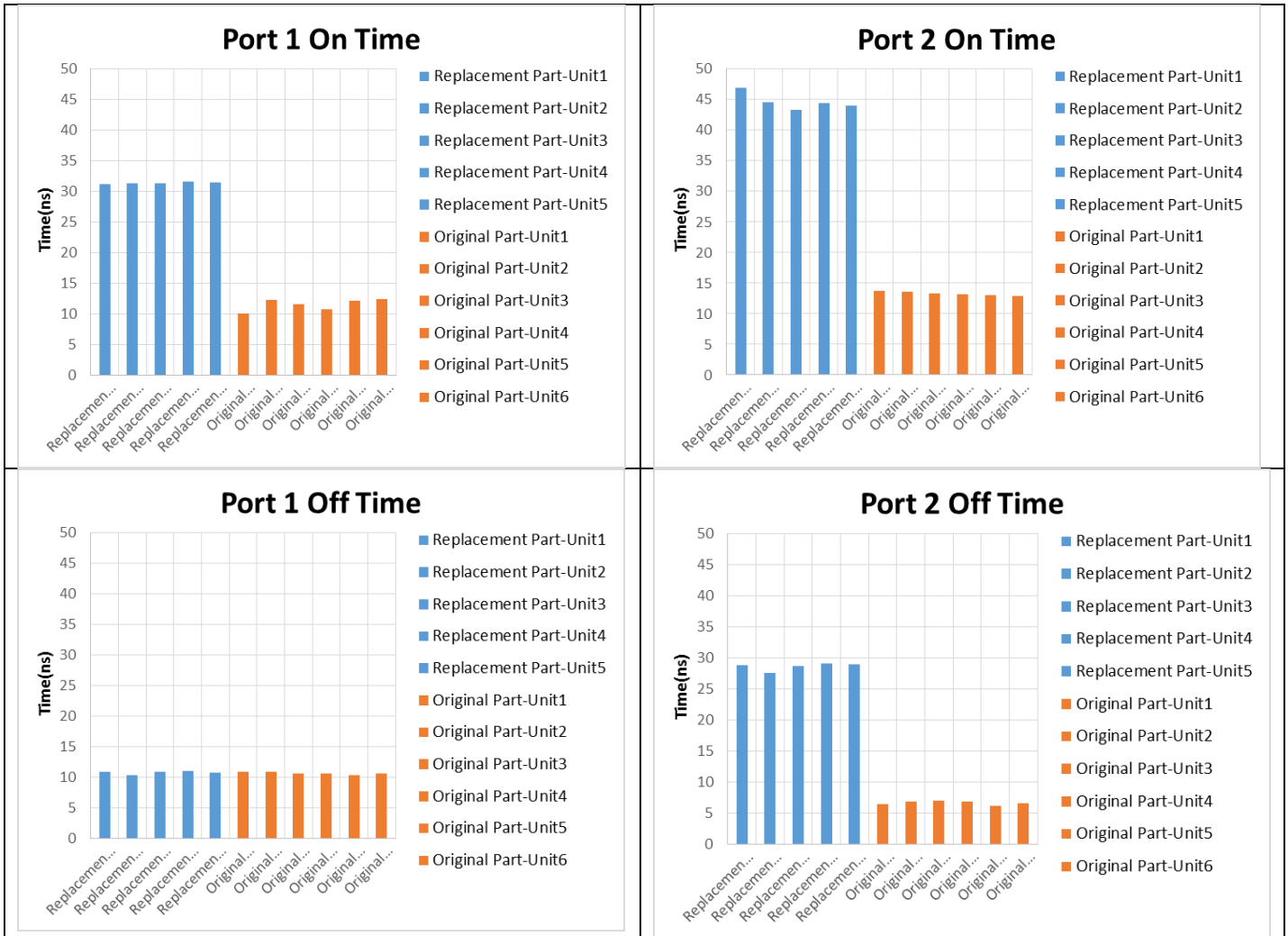
Rise Time: 10 to 90% RF, Fall Time: 90% to 10% RF

Switching Time:

On Time 50% Control to 90%/10% RF, Fall Time 50% Control to 10% RF



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