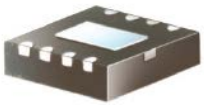
REPLACEMENT PART REFERENCE GUIDE, M3SWA-2-50DR+ AN-80-024

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

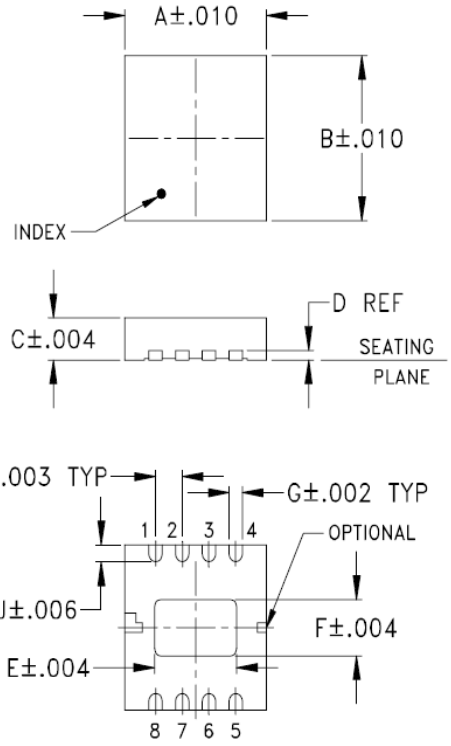
Replacement Part has been judged by Mini-Circuits Engineering as a close replacement to Original Part[a]

MECHANICAL DIMENSIONS & PCB LAND PATTERN

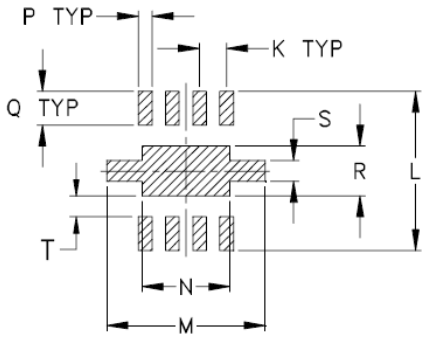
ORIGINAL PART: M3SWA-2-50DR+	REPLACEMENT PART: M3SWA-2-50DRB+

Case Style DL805 (No Change)

Outline Dimensions



PCB Land Pattern

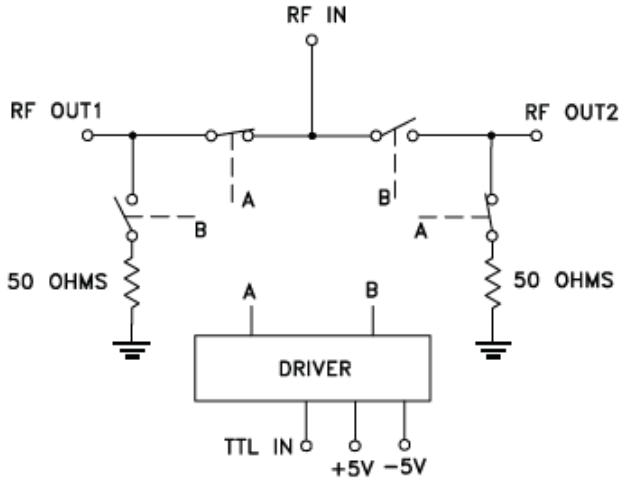


Suggested Layout,
Tolerance to be within ±.002

Marking	Marking
3SWA	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-2-50DRB+



Application Circuit

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

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
TTL IN	2
VDD(+5V)	5
VEE(-5V)	7
TLL GND	3
GND	8,Paddle

Note:
We rename Pin 5 from '+5V' to 'VDD(+5V)'.
We rename Pin 7 from '-5V' to 'VEE(-5V)'.

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.

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-2-50DRB+)
Positive Power Supply (V_{DD})	+4.8 to +5.25V over -40 to 85°C +4.9to +5.25V over -55 to 100°C	+4.75 to +5.25V over -55 to 100°C
Negative Power Supply(V_{EE})	-5.25V to -4.8V over -40 to 85°C -5.25V to -4.9V over -55 to 100°C	-5.25 to -4.75V over -55 to 100°C
Control Input Low Voltage	0V Min, 0.8V Max	0V Typ., 0.8V Max
Control Input High Voltage	2V Min, 5V Max	2.1V Min, 2.3V Typ. 5V Max
Positive Supply Current (I_{DD}) Negative Supply Current (I_{EE})	9 mA max 9 mA max	5mA Typ. & 9mA Max. 3mA Typ. & 9mA Max.
Control Current Low	0.2mA max	0mA Typ. & 0.2mA Max.
Control Current High	5mA max	0.4mA Typ. & 5mA Max.
Rise Time (10 to 90%RF)	5ns typ. & 10ns max.	3.3ns Typ.
Fall Time (90 to 10%RF)	5ns typ. & 10ns max.	4.6ns Typ.
ON Time (50% Control to 90% RF)	10ns typ. & 15ns max	14.4ns typ.
OFF Time(90% Control to 50% RF)	10ns typ. & 15ns max	11.3ns Typ.
Video Leakage	30mV Typ.	42.5mV Typ.
ESD HBM	Class 1C (1000 to <2000V)	Class 0 (Pass 100V)
Electrical Specification:		
Insertion Loss Spec Max	2.0dB @2000-4500MHz	2.0dB @2000-4000MHz 2.5dB @4000-4500MHz

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.

2) PERFORMANCE COMPARISON CURVES: Original Part (VDD = 5V & VEE =-5V, Vctrl = 0 & 2.3V)
Replacement Part (VDD = 5 &VEE=-5V, Vctrl = 0 & 2.3V)

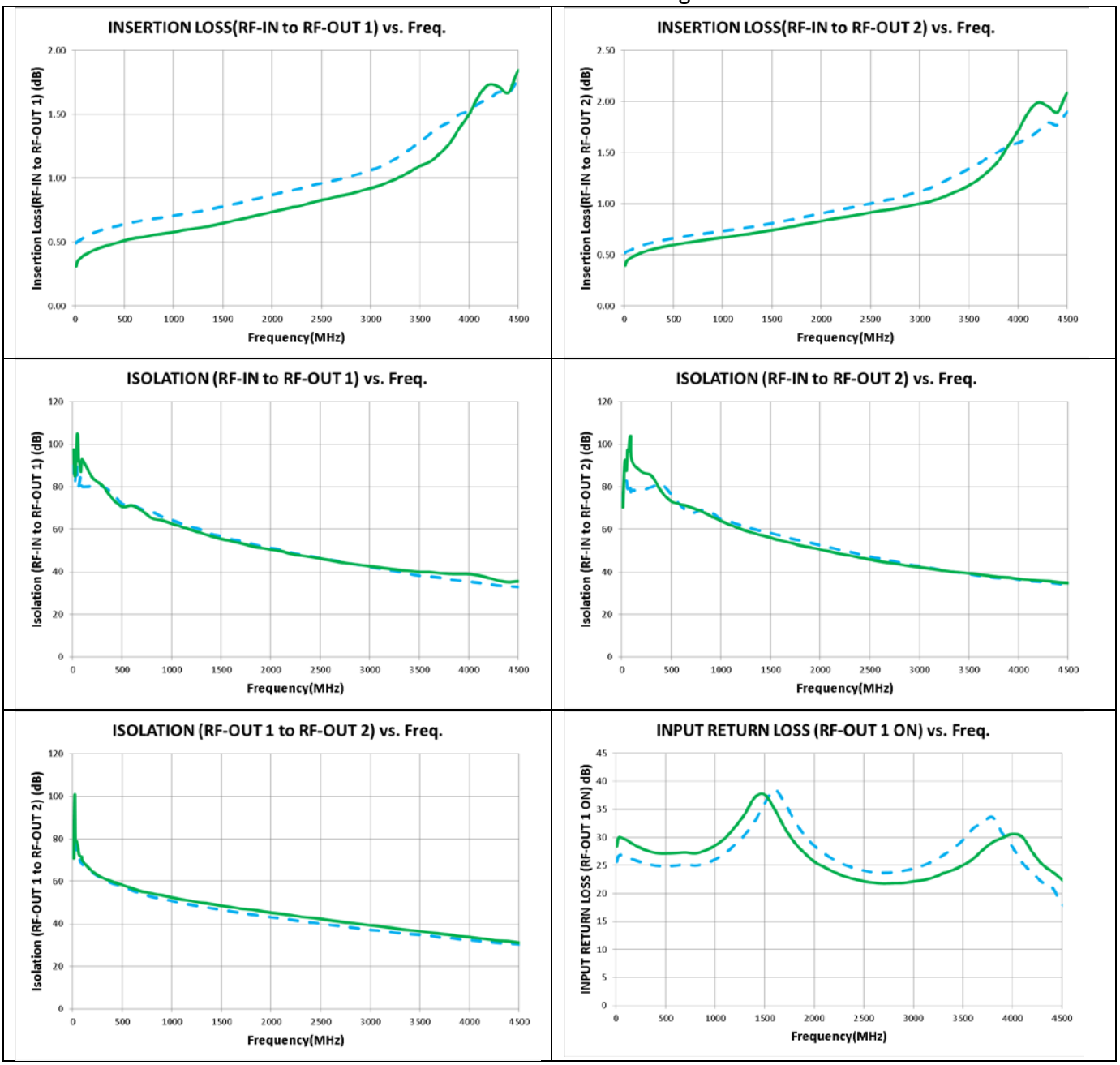
RF Performance Comparison	Freq (MHz)		M3SWA-2-50DRB+ (Replacement Model) Data of 25 Units			M3SWA-2-50DR+ (Original Model) Data of 1 Unit		
	From	To	Min.	Avg.	Max.	Min.	Avg.	Max.
INSERTION LOSS Max(S-1,S-2) (ON STATE) (dB)	10	100	0.4	0.5	0.6	0.5	0.5	0.6
	100	1000	0.5	0.6	0.7	0.6	0.7	0.7
	1000	2000	0.7	0.8	0.9	0.7	0.8	0.9
	2000	4000	0.8	1.1	1.76	0.9	1.2	1.6
	4000	4500	1.7	1.9	2.1	1.6	1.7	1.9
ISOLATION LOSS Min(S-1,S-2) (OFF STATE) (dB)	10	100	69.1	90.5	113.4	73.6	79.6	82.8
	100	1000	61.5	73.6	105.1	64.4	72.9	80.3
	1000	2000	49.8	56.0	64.3	51.3	57.2	64.4
	2000	4000	36.3	42.7	51.0	35.4	42.6	51.3
	4000	4500	34.3	35.7	37.0	32.9	34.0	35.4
ISOLATION (1-2)	10	100	68.4	74.4	105.1	67.7	72.1	80.2
	100	1000	51.3	58.3	70.1	49.9	56.6	67.7
	1000	2000	44.3	48.1	52.0	42.6	46.0	49.9
	2000	4000	32.2	38.7	44.8	32.0	36.9	42.6
	4000	4500	30.4	31.6	32.8	30.5	31.2	32.0
RETURN LOSS PORT -S (dB)	10	100	26.3	28.4	29.7	25.3	26.1	26.3
	100	1000	25.8	27.3	30.0	24.8	25.4	26.3
	1000	2000	25.5	31.5	39.0	26.1	31.6	37.9
	2000	4000	21.2	24.5	34.5	23.7	27.0	33.6
	4000	4500	21.7	26.9	34.5	17.1	20.7	24.8
RETURN LOSS (ON STATE) (dB)	10	100	26.3	28.4	29.7	25.3	26.1	26.3
	100	1000	26.1	27.7	30.2	24.8	25.4	26.3
	1000	2000	20.1	26.0	32.6	19.7	24.3	28.7
	2000	4000	18.0	20.1	23.6	18.0	19.9	23.3
	4000	4500	16.1	19.8	23.4	17.1	20.7	23.3
RETURN LOSS (OFF STATE) (dB)	10	100	31.0	42.6	63.8	33.9	34.9	35.7
	100	1000	27.9	34.2	49.3	28.0	30.2	33.9
	1000	2000	24.2	28.9	36.7	27.9	30.4	33.5
	2000	4000	21.0	27.7	33.7	23.7	27.4	33.5
	4000	4500	19.6	21.2	25.0	22.3	23.0	23.7
INPUT IP3 Min(LSB,USB @ Port 1&2) (dBm) @Pout =0dBm/Tone	10	100	34.7	39.7	43.9	34.3	39.0	43.5
	100	1000	42.1	44.7	48.1	42.8	44.4	47.0
	1000	2000	42.1	46.5	49.1	42.8	45.3	46.7
	2000	4000	39.1	44.0	49.0	34.2	41.5	46.7
	4000	4500	39.1	40.1	41.6	34.2	34.3	34.5
INPUT P1dB (Min of Port 1&2) (dBm)	10	100	12.1	18.0	23.7	16.7	21.0	25.4
	100	1000	22.8	25.1	26.8	25.4	27.4	28.6
	1000	2000	25.4	26.2	27.2	28.6	28.7	28.8
	2000	4000	23.8	25.6	27.2	23.5	26.5	28.8
	4000	4500	23.8	24.7	25.6	23.5	23.7	23.8

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.

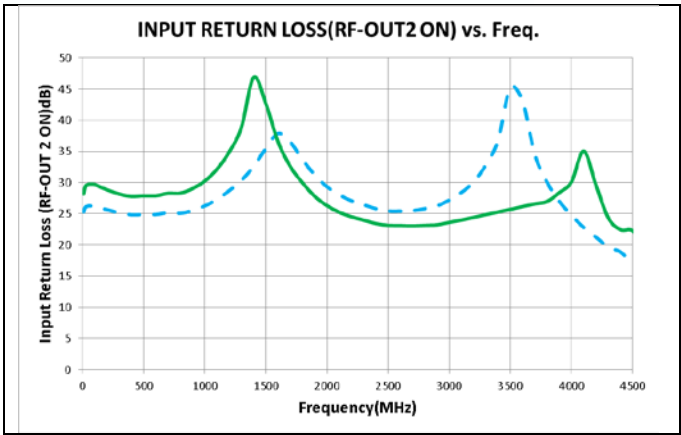
3) PERFORMANCE COMPARISON CURVES: Original Part (Vdd = 5 &-5V, Vctrl = 0 & 2.3V)
Replacement Part (Vdd =5V, Vctrl = 0 & 2.3V)

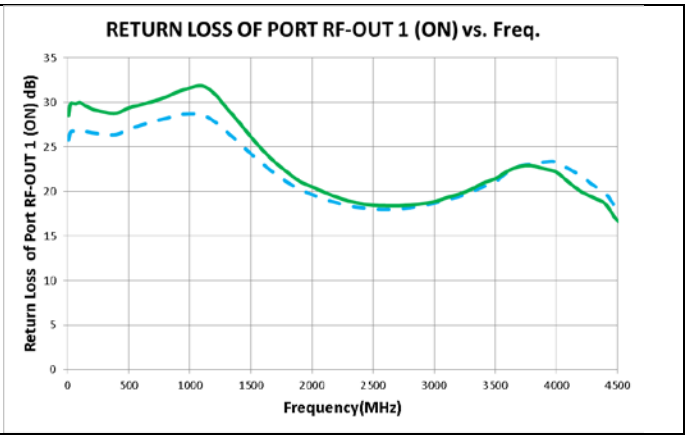
Data of Replacement Part

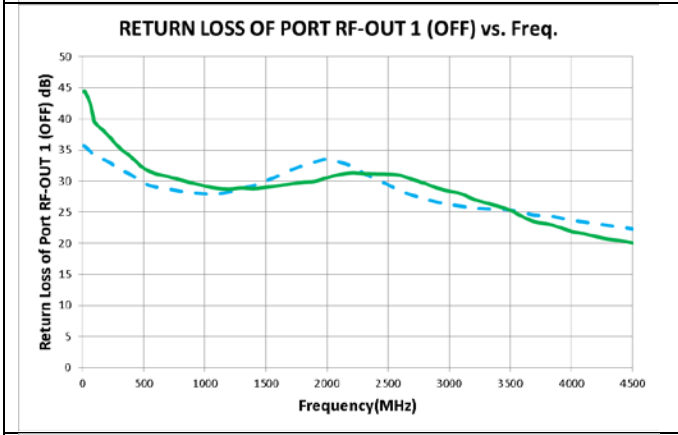
Data of Original Part

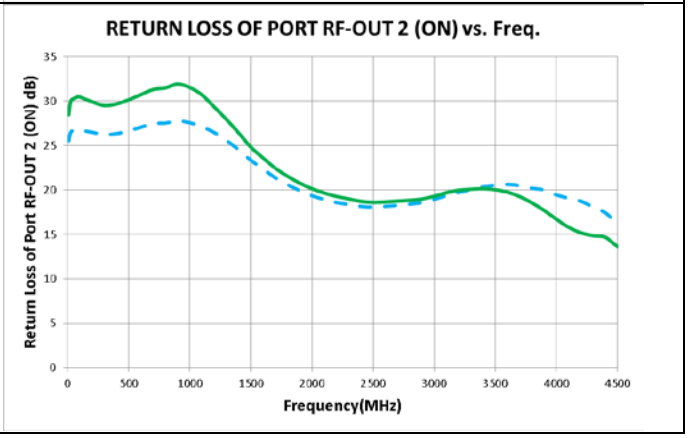


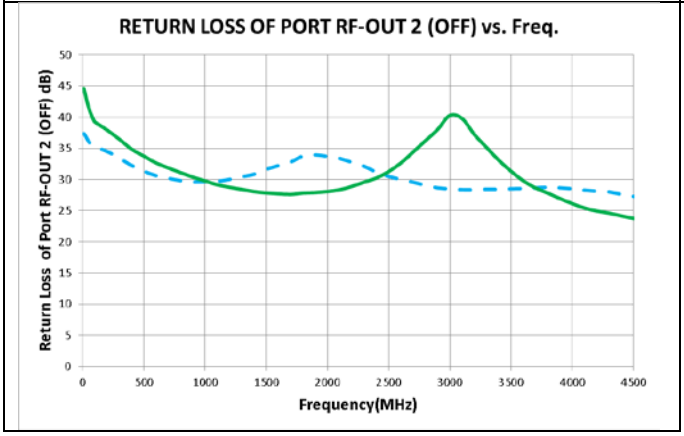
Notes:
a. Suitability for model replacement within a particular system must be determined by and is solely the responsibility of the customer based on, among other things, electrical performance criteria, stimulus conditions, application, compatibility with other components and environmental conditions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







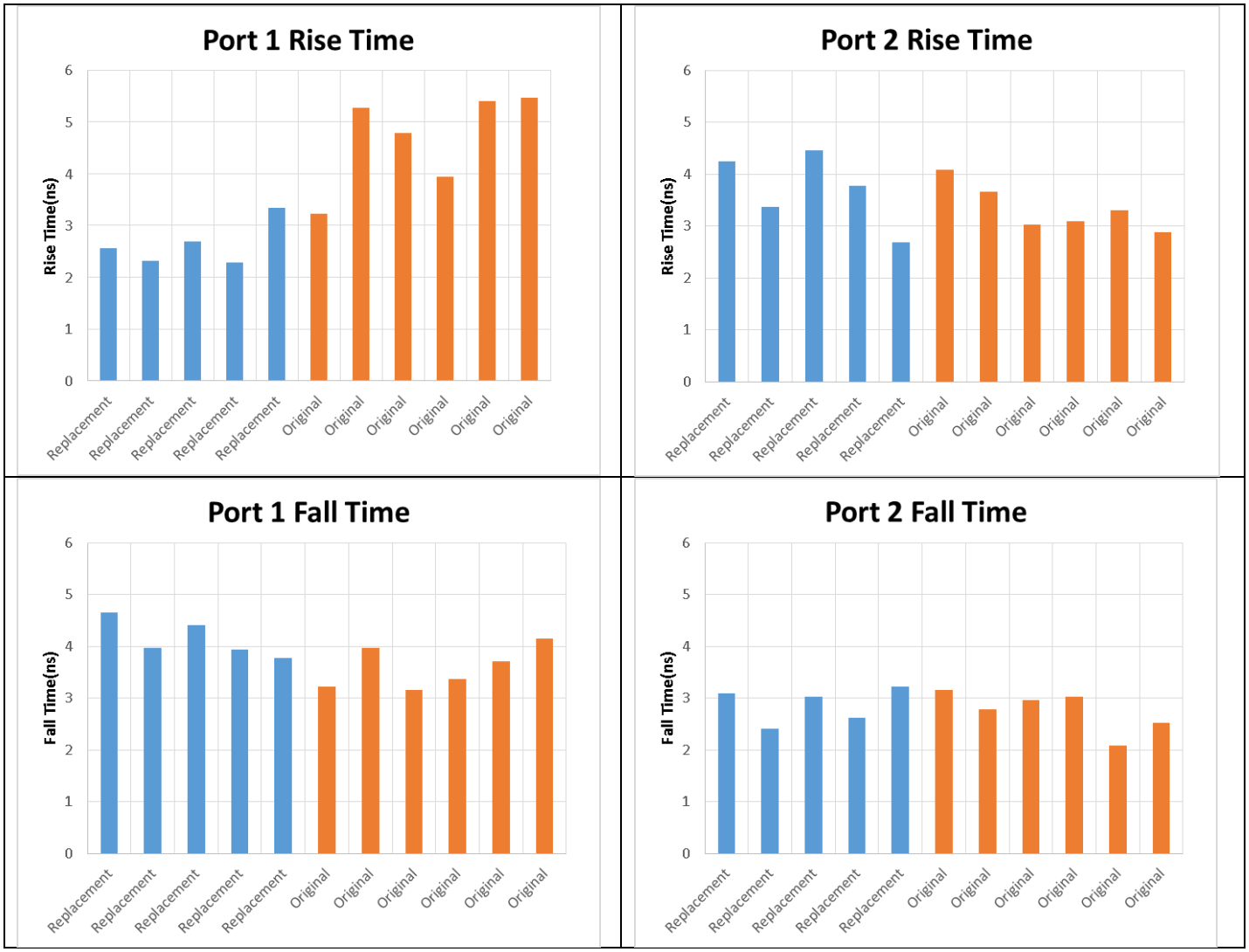




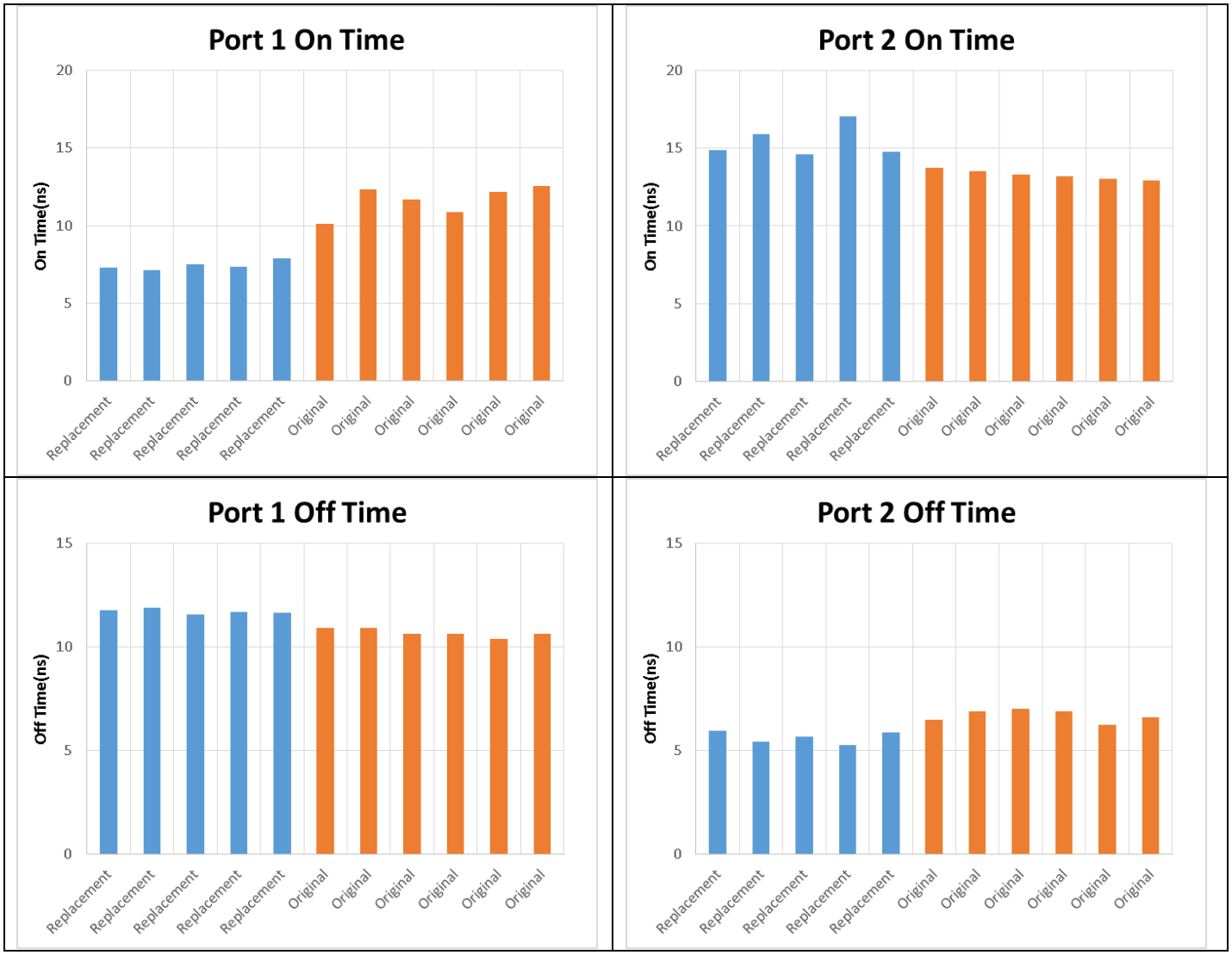
Notes:
a. Suitability for model replacement within a particular system must be determined by and is solely the responsibility of the customer based on, among other things, electrical performance criteria, stimulus conditions, application, compatibility with other components and environmental conditions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

1) **SWITCHING/RISE/FALL TIME COMPARISON (Original Part (Vdd = 5 &-5V, Vctrl = 0 & 3.7V)**
Replacement Part (Vdd =5 & -5V, Vctrl = 0 & 2.3V)

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



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.



IMPORTANT NOTICE

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.