

Forecasting models and methods

#	Product Name	Key Characteristics	Suggested Forecasting Models/Methods
1	SWITCH Enterprise High 1	Sustaining, Declining trend (stabilizing recently), Moderate volatility, Strong seasonality (0.9338, Q4 peak), Lag 1 autocorrelation, Annual cycle	SARIMA (captures seasonality, trend, autocorrelation), Holt-Winters' Seasonal (handles trend & strong seasonality), Seasonal Decomposition + Trend model.
2	SWITCH Enterprise Ultra High 1	Sustaining, Strong Growth (exponential), High volatility, Strong seasonality (0.7199, Q4 peak), Lag 1 autocorrelation, Annual cycle	SARIMA (handles seasonality, growth, autocorrelation), Exponential Growth Models, Holt-Winters' Seasonal (additive or multiplicative depending on variance). ML models might capture complex growth but need careful validation due to high volatility.
3	SWITCH Enterprise Ultra High 2	Sustaining, Declining trend (slight recovery), Low volatility, Strong seasonality (0.7833, Q4 peak), Lag 1 autocorrelation, Annual & Semi-Annual cycles	SARIMA (can handle multiple cycles/seasonality, trend, autocorrelation), Holt-Winters' Seasonal, Regression with seasonal/cycle dummies or Fourier terms.
4	SWITCH Enterprise Low	Sustaining, Growing trend, Very High volatility, Weak seasonality (0.2075, Q1 peak), No autocorrelation, Semi-Annual & Three-Quarter cycles	Robust methods needed due to extreme volatility. Consider Croston's method (if intermittent), Simple Exponential Smoothing (if no clear pattern dominates noise), or potentially ML models with careful feature engineering and outlier handling. ARIMA might struggle with high volatility.
5	TRANSCIVER MODULE Mid 1	Sustaining, Declining trend (significant drop), Moderate volatility, Moderate seasonality (0.5130, Q2 peak), No autocorrelation, No clear cycles, Outlier detected (FY22 Q2)	ARIMA (can model trend, moderate seasonality), Holt-Winters' Seasonal (additive/multiplicative), Exponential Smoothing with Trend (Holt's). Address outlier before modeling.
6	POWER SUPPLY High	Sustaining, Declining trend (moderate recovery), Low volatility, Moderate seasonality (0.6482, Q4 peak), Lag 1 autocorrelation, Annual & Three-Quarter cycles	SARIMA (handles cycles, seasonality, trend, autocorrelation), Holt-Winters' Seasonal, Regression with seasonal/cycle indicators.
7	TRANSCIVER MODULE High	Sustaining, Volatile Growth, Very High volatility, Moderate seasonality (0.5970, Q3 peak), No autocorrelation, Annual, Semi-Annual, & Three-Quarter cycles	Extremely difficult to forecast due to volatility and multiple cycles. Ensemble methods combining cycle models (e.g., Regression with Fourier terms) and simpler smoothing might work. Validate any model rigorously. Consider external factors if possible.
8	ACCESS POINT Mid	Sustaining, Strong Growth, Moderate volatility, Moderate seasonality (0.4967, Q4 peak), Lag 1 autocorrelation, Annual cycle	SARIMA (handles growth, seasonality, cycle, autocorrelation), Holt-Winters' Seasonal, Regression with trend and seasonal terms.
9	POWER SUPPLY Mid	Sustaining, Declining trend (stabilizing), Moderate volatility, Strong seasonality (0.6992, Q4 peak), Lag 1 autocorrelation, Annual, Three-Quarter & Extended cycles	SARIMA (can potentially handle multiple cycle lengths, trend, seasonality), Holt-Winters' Seasonal, Regression with multiple cycle/seasonal indicators.
10	SERVER	Sustaining, Growing trend, Moderate volatility, Moderate seasonality (0.5870, Q4 peak), Lag 1 autocorrelation, Semi-Annual cycle	SARIMA, Holt-Winters' Seasonal, Regression with trend and seasonal/cycle terms.
11	PROCESSOR	Sustaining, Flat trend, High volatility, Insufficient data for seasonality, No autocorrelation	Simple models due to limited data and high volatility: Simple Exponential Smoothing (SES), Moving Average. Croston's method if demand is intermittent. Forecasting will likely have high error.
12	SWITCH Data Center High	Sustaining, Slight Growth, Moderate volatility, Moderate seasonality (0.4571, Q2 peak), No autocorrelation, Annual, Semi-Annual, Three-Quarter & Extended cycles	Complex cycles. SARIMA (attempt modeling dominant cycle), Regression with Fourier terms for multiple cycles, Seasonal Decomposition + Trend model.
13	TRANSCIVER MODULE Mid 2	Sustaining, Strong Growth (exponential), High volatility, Moderate seasonality (0.5130, Q2 peak), No autocorrelation, No clear cycles. Assuming this is distinct from #5 based on Trend data	Similar to #2 but less seasonality: Exponential Growth Models, ARIMA (capturing growth), Holt's Linear Trend. ML models could be considered given exponential growth but need validation due to volatility.

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14	ROUTER Enterprise Mid 1	Sustaining, Strong Growth, Moderate volatility, Strong seasonality (0.6924, Q4 peak), No autocorrelation, Annual, Three-Quarter & Extended cycles	SARIMA (handles growth, seasonality, cycles), Holt-Winters' Seasonal, Regression with trend and seasonal/cycle indicators.
15	MEMORY	Decline, Steep Decline trend, Low volatility, Strong seasonality (0.7561, Q4 peak), No autocorrelation, Annual cycle	SARIMA (handles decline, seasonality, cycle), Holt-Winters' Seasonal (Damped trend might be suitable given decline), Seasonal Decomposition + Damped Trend model.
16	ROUTER Enterprise Mid 2	Sustaining, Growing trend, Moderate volatility, Weak seasonality (0.2978, Q4 peak), Lag 1 autocorrelation, Annual & Semi-Annual cycles	ARIMA (handles trend, autocorrelation, weak seasonality/cycles), Holt's Linear Trend method, Regression with trend and potentially cycle terms.
17	SWITCH Data Center Mid 1	Sustaining, Declining trend (stabilizing), Moderate volatility, Weak seasonality (0.2085, Q2/Q3 peaks), No autocorrelation, Semi-Annual & Three-Quarter cycles, Outlier detected (FY22 Q3)	ARIMA (handles decline, weak seasonality/cycles), Holt's Linear Trend (Damped). Address outlier. Regression with trend and cycle terms could be attempted.
18	ROUTER Enterprise Low	Decline, Volatile Decline (recent spike), Very High volatility, Moderate seasonality (0.4690, Q2 peak), No autocorrelation, Semi-Annual & Three-Quarter cycles	Very difficult due to high volatility, decline, and recent spike. Robust methods: Croston's (if intermittent), SES. The recent spike might be an outlier or regime change – investigate causes. Any model will likely have high error. Simple benchmarks might be best.
19	SWITCH Data Center Mid 2	Sustaining, Declining trend (stable), Moderate volatility, Weak seasonality (0.3004, Q1/Q3 peaks), No autocorrelation, Annual & Three-Quarter cycles, Outlier detected (FY22 Q2)	ARIMA (handles decline, weak seasonality/cycles), Holt's Linear Trend (Damped). Address outlier. Regression with trend and cycle terms.
20	SWITCH Enterprise High 2	NPI, Strong Growth, Low volatility, Perfect seasonality (1.0000, Q4 peak), No autocorrelation, Semi-Annual cycle	SARIMA (perfect seasonality suggests strong fit), Holt-Winters' Seasonal, Regression with trend and seasonal dummies. Given NPI status, monitor for changes in pattern as it matures.

Group 1: SARIMA (Seasonal ARIMA) Primary Recommendation

Products with strong seasonality, clear cycles, and autocorrelation:

- 1. SWITCH Enterprise High 1
- 2. SWITCH Enterprise Ultra High 1
- 3. SWITCH Enterprise Ultra High 2
- 4. POWER SUPPLY High
- 5. ACCESS POINT Mid
- 6. POWER SUPPLY Mid
- 7. SERVER
- 8. ROUTER Enterprise Mid 1
- 9. MEMORY
- 10. SWITCH Enterprise High 2

Group 2: ARIMA (Non-Seasonal) Primary Recommendation

Products with weaker seasonality or where trend dominates:

- 1. TRANSCEIVER MODULE Mid 1
- 2. ROUTER Enterprise Mid 2

- 3. SWITCH Data Center Mid 1
- 4. SWITCH Data Center Mid 2

Group 3: Exponential Growth/Trend Models Primary Recommendation

Products with strong growth patterns:

- 1. TRANSCEIVER MODULE Mid 2

Group 4: Simple/Robust Methods Needed

Products with high volatility, limited data, or difficult forecasting characteristics:

- 1. SWITCH Enterprise Low
- 2. PROCESSOR
- 3. ROUTER Enterprise Low

Group 5: Complex/Multiple Approaches Recommended

Products requiring specialized or ensemble approaches:

- 1. TRANSCEIVER MODULE High
- 2. SWITCH Data Center High