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Toshiba POS Printers Excel

Comparing Toshiba TCx™ Dual Station POS Printers against Epson

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Executive Summary

Retail is a fast-paced environment where speed, clarity and reliability are key contributors to customer service which differentiates one retailer from another. Therefore, a printer that consistently delivers receipts and checks that are crisp within a minimal timeframe can make a significant difference in customer satisfaction.

Edison Group conducted research and a series of tests comparing Dual Station Point-of-Sale (POS) printers, namely, Toshiba TCx™ Dual Station Printer (6145-2TN) vs. Epson (TM-H6000V) focusing on four categories, namely performance, economy, architecture and serviceability as they are the main considerations when purchasing a POS printer for retail.

Retail is a fast-paced environment where performance, economy, serviceability and architecture are key contributors to customer service which differentiates one retailer from another.

Test cases were designed to simulate real-life situations:

- Customers purchasing different numbers of items resulting in short, medium and long receipts,
- Retail outlets customizing their receipts by adding graphics.

Strict testing procedures were conducted, where each test was designed to be repeatable, input used for each test was identical for each manufacturer, and the tests were recorded visually by video or photograph.

For the categories where live tests were not possible, research was conducted gathering and comparing manufacturer published printer specifications and third-party (Energy Star for example) documentation.

Within each of the categories, several criterion were identified and assigned a point value based on importance and complexity.

After all of the points were assigned, Toshiba was clearly the better choice.

What is Important When Considering a Purchase

Performance, Economy, Serviceability and Architecture and are the main considerations when considering a POS printer purchase and are used to form the following evaluation matrix:

Performance	Economy
Serviceability	Architecture



Performance

This category focuses on printing speed, clarity, font and barcode alternatives, MICR reading capabilities and accuracy, and media handling, where applicable.

Printing Speed

Amount of time it takes from the start to finish of the operation. Receipt printing, MICR check reading, face and frank printing are tested.

Clarity

Clarity is based on the crispness and legibility of the printed image. Comparisons are based on published and printed results for:

- Receipts – printing of text, barcodes, graphics and grayscale.
- Checks – printing of text.

Font Alternatives

Types, variations and sizes of the fonts.

Media Handling

Width, thickness and type of media supported.

Barcode

Types, and variations of barcodes.

MICR

Ability to read MICR's and accuracy.



Economy

This category focuses on options to conserve paper and power.

Paper Reduction

All of the printers have the ability to save paper. Variations occur due to the different paper-saving strategies and reduction thresholds. Comparisons are based on paper length and clarity of end-result.

Power Usage

Comparison is based on power consumption in the various printer states, i.e., idle and active. Energy Star Certifications are a consideration as well.

It is included here for completeness, but is not a major factor.



Serviceability

Frequently overlooked, but a critical category is serviceability. The easier it is to maintain or fix a printer the more time the POS printer will be available for use. Special tool requirements and hard to get to access points, limit a retailer's ability to self-diagnose and fix as well as increasing the mean-time-to-repair.

Component Life

The life of critical components like print heads and receipt cutter blades determines how often the printer has to be serviced.

Paper Loading

The ability to quickly load paper is a key feature of a printer as the need to replace a paper roll is part of the daily operation and impacts the speed at which the operator can support customers.

Sensors

Sensors provide immediate indication of operational issues as they occur. Some sensors indicate low paper and ink levels and others indicate paper jams, ink and paper outages or mechanical/electrical issues.

Cable Management

Formalized cable management is directly responsible for extending POS printer life. Cable strain and breakage can be eliminated by neatly and reliably routing cables out of the way. Avoiding service to replace damaged cables/devices will ease installation and improve uptime. Cable management also contributes to neatness or overall look of the POS printer in the store



Architecture

The materials, design and construction of the POS printer directly affects all the other categories, usability, flexibility and serviceability. There are other considerations like impact on environment at end-of-life, and cost.

Basic Construction

A review of POS printer physical dimensions and basic construction provides insights into the architectural design and printer life. For example, steel-reinforced printer-body, cantilevered support for Dual Station printers extends the life.

Components

Printer component placement and life are compared. This includes print heads, receipt cutters and buttons.

POS Printers to be Reviewed

The selection of POS printers was based on several criteria including, but not limited to:

- Market Share – the company and/or system was considered a leader in the retail marketplace;
- Functions/Features – each system supported the functions required in the retail environment;

Following are the specifications of the tested systems:

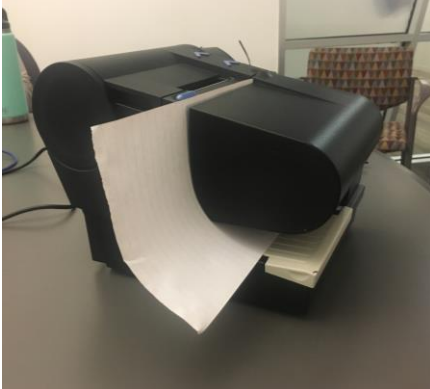

Printers/Spec	Toshiba TCx™ Dual Station POS Printer (6145-2TN)	Epson Dual Station POS Printer (TM-H6000V)
Print Heads		
Receipt	Thermal line printing	Thermal line printing
Slip/Endorsement	One impact print head	Two impact print heads
Dimensions (WxDxH)	7.93" x 10.83" x 7.73"	7.32" x 10.95" x 7.13"
Weight	9.22 lbs. (4.2 kg)	9.7 lbs. (4.4 kg)
Case Color:	Raven Black; Pearl White	Black (EBCK); White (ENN8.5)
		

Table 1 – POS Printer Overview

Comparison Methodology

For a comparison of the selected POS printers to be valid, these test elements need to be validated:

- Comparable Test Systems – the POS printers selected need to provide the functionality needed to support retail requirements including receipt item printing, receipt graphics, receipt logos, check MICR reading, check front and frank printing
- Comparison Criterion – relevant and meaningful to retail
- Test Lab – the test lab conditions should allow a complete and consistent test environment
- Qualified Technicians – the lab technicians need to be highly qualified to perform the tests and to understand the business impact of their findings
- Repeatable Test Procedures/Results – the tests and/or breakdown need to be repeatable and produce consistent results.

Detailed Dual Station POS Printer Review

The following is an exception-based review of the criterion chosen to evaluate Dual Station POS printers.

Tests and/or information provided by independent 3rd parties and the manufacturer were used to evaluate each of the criterion listed below.



Performance

Receipt Printing Speed

There were three speed tests conducted, simulating different receipt lengths. Objective was to compare the times needed to print receipts on the two different printers.

Toshiba's TCx™ Dual Station POS Printer published receipt speeds (406mm/sec) are 13.8% faster than Epson Dual Station POS Printer (350mm/sec). Test results reflected the speed difference as Toshiba receipt printing was greater than 10% faster than Epson.



Weight / Evaluation Criteria	Test Results	Toshiba TCx™ Dual Station POS Printer	Epson Dual Station POS Printer
Short Length Receipt Comparison (9.5" Length): <ul style="list-style-type: none"> Published Speed; Observed Speed – observations, supported by video; 	<ul style="list-style-type: none"> Overall test duration - 1.55 sec overall; Toshiba prints 6.79 inches/second vs. Epson 6.13 inches/sec Toshiba is 10.7% faster Toshiba finished first 		
Medium Length Receipt Comparison (14.5" Length): <ul style="list-style-type: none"> Published Speed; Observed Speed – observations, supported by video; 	<ul style="list-style-type: none"> Overall test duration – 2.00 sec overall; Toshiba prints 8.06 inches/second vs. Epson 7.25 inches/sec Toshiba is 11.1% faster Toshiba finished first 		
Long Length Receipt Comparison (23.0" Length): <ul style="list-style-type: none"> Published Speed; Observed Speed – observations, supported by video; 	<ul style="list-style-type: none"> Overall test duration – 2.72 sec overall; Toshiba prints 9.39 inches/second vs. Epson 8.46 inches/sec Toshiba is 11.0% faster Toshiba finished first 		

Table 2 – Receipt Speeds

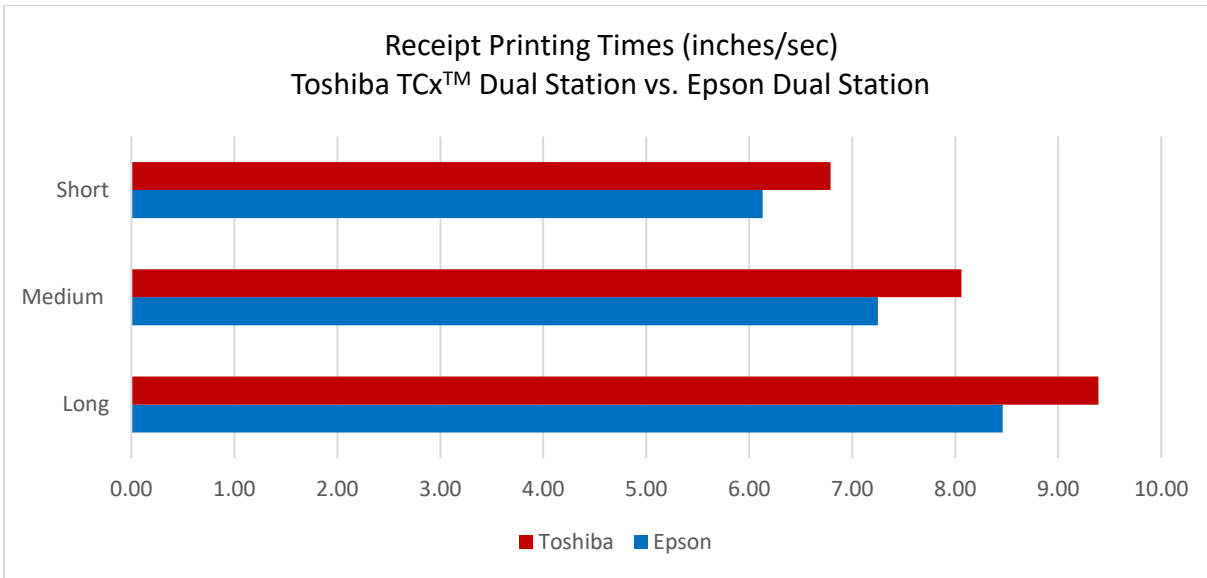


Chart 1 – Receipt Printing Speeds

Check MICR Read, Face and Frank Printing Speed

There were three speed tests conducted incorporating check MICR reading, check front (face) and back (frank) printing. Objective was to compare the times needed to print receipts on the two different printers. Note, Epson has two impact print heads designed to accommodate face and frank printing so the check does not need to flip. Toshiba has one impact print head for check printing so check is flipped to accommodate frank printing.

Weight / Evaluation Criteria	Test Results
Read MICR, Face and Frank Printing <ul style="list-style-type: none"> Observed Speed – observations, supported by video; 	Observations: <ul style="list-style-type: none"> Epson check processing – 12.80 seconds; Toshiba check processing – 7.25 seconds; Overall, Toshiba is 76.6% faster Epson's paper forwarding at end chugged along.
Read MICR, Frank Printing <ul style="list-style-type: none"> Observed Speed – observations, supported by video; 	Observations: <ul style="list-style-type: none"> Epson check processing – 5.80 seconds; Toshiba check processing – 4.25 seconds; Overall, Toshiba is 36.5% faster Both printers had a variation of forward (MICR), backward (repositioning), forward (print frank) motion.
Read MICR, Face Printing <ul style="list-style-type: none"> Published Speed; Observed Speed – observations, supported by video; 	Observations: <ul style="list-style-type: none"> Epson check processing – 11.0 seconds; Toshiba check processing – 6.25 seconds; Overall, Toshiba is 76.0% faster Epson's paper forwarding at end of printing chugged along.

Table 3 – Check Processing Speeds

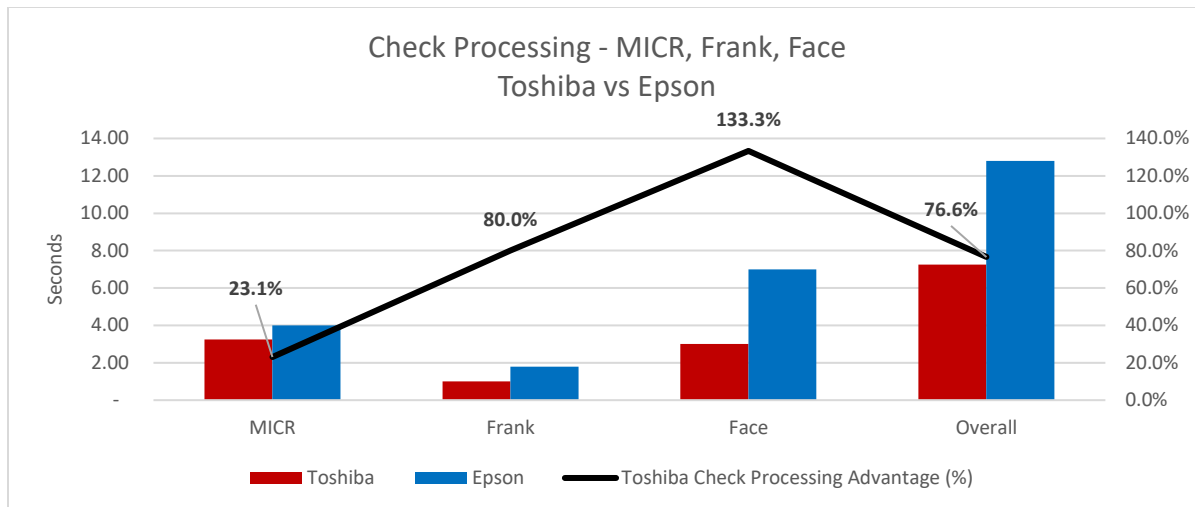


Chart 2: Toshiba Check Processing Advantage - MICR, Frank, Face

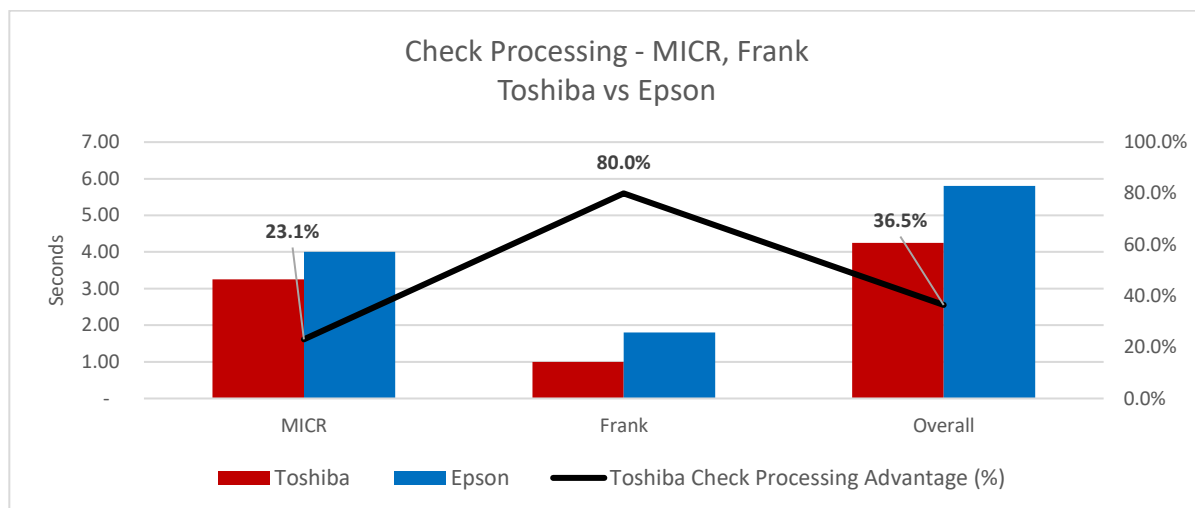


Chart 3: Toshiba Check Processing Advantage - MICR, Frank

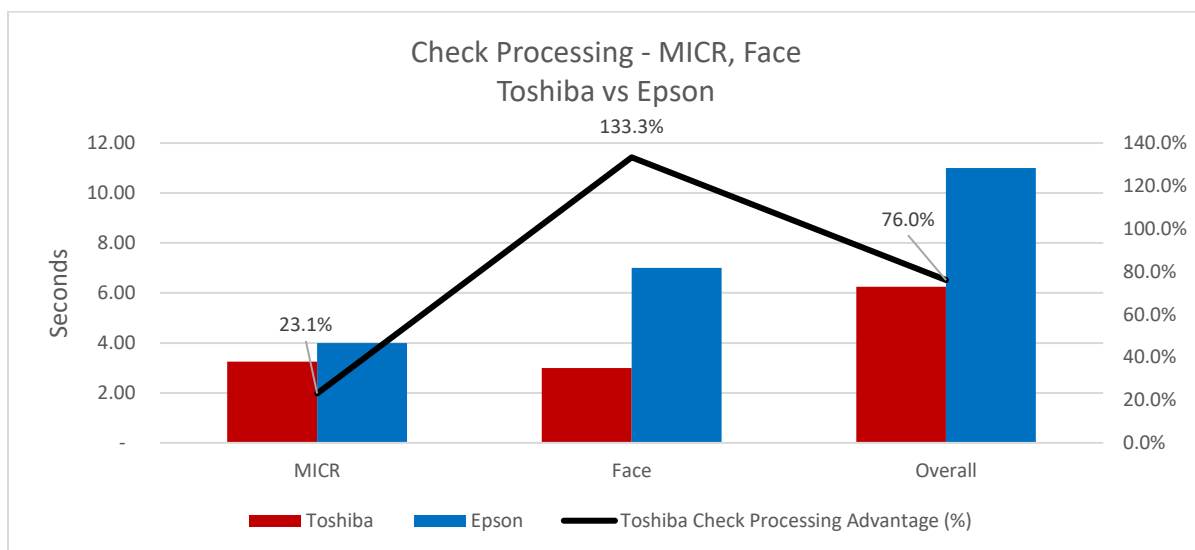


Chart 4: Toshiba Check Processing Advantage - MICR, Face

Image Clarity

Image clarity for receipts was evaluated for the dual printers based on text image, barcode image, BW images and grayscale images using the same thermal paper.

Toshiba’s TCx™ Dual Station POS Printer has a published 203 DPI (Dots/Inch) capability while Epson Dual Station has a published 180 DPI capability.

Evaluation Criteria	Test Results
Text Image – relative clarity from one receipt vs the other;	<p>Image Clarity – At a distance, no discernable difference. Up close, Toshiba has a clearer, crisper image than Epson;</p> <p>Test Observations - Fonts are slightly different, but Epson is more granular looking than Toshiba..</p>
Barcode Image – relative clarity from one receipt vs the other;	<p>Image Clarity - Virtually identical;</p> <p>Test Observations - Barcode images are similar, sizes differ between the two, while QR codes appear different, they link to same location.</p>
BW Image - relative clarity from one receipt vs the other;	<p>Image Clarity – Toshiba’s BW Images are clearer.</p> <p>Test Observations - Some discernable differences in BW image clarity, Toshiba is slightly better as edges are more well-defined and image is filled in more completely.</p>
Grayscale – relative clarity from one receipt vs the other;	<p>Image Clarity - Toshiba grayscale images are clearer.</p> <p>Test Observations - Even though they both have 16 grayscale levels, Toshiba produces a better image than Epson.</p>
Check Printing Face – relative clarity from one check face vs. the other;	<p>Image Clarity – Toshiba face text is clearer.</p> <p>Test Observations – Spaces can be observed in each character on the check face for Epson. Toshiba is clearer.</p>
Check Printing Frank – relative clarity from one check frank vs. the other;	<p>Image Clarity - Toshiba frank text clearer.</p> <p>Test Observations - Spaces can be observed in each character on the check frank for Epson. Toshiba is clearer.</p>

Table 4 – Dual Station Image Clarity Test Summaries

Looking at the images below, it is evident that TCx™ Dual Station POS Printer produces a clearer image than Epson Dual Station POS Printer.

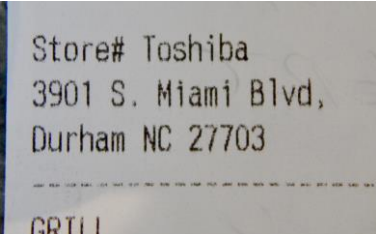


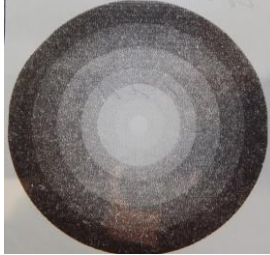



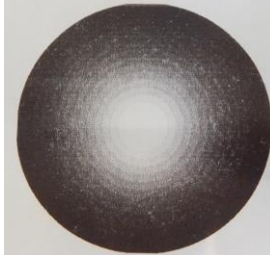
Text – Epson/Toshiba	Grayscale – Epson/Toshiba	Grayscale – Epson/Toshiba	Grayscale – Epson/Toshiba
<p>Epson</p> 	<p>Epson</p> 	<p>Epson</p> 	<p>Epson</p> 
<p>Toshiba</p> 	<p>Toshiba</p> 	<p>Toshiba</p> 	<p>Toshiba</p> 

Table 5 – Dual Station Image Clarity Test Samples

MICR

Toshiba’s TCx™ Dual Station POS Printer MICR published accuracy (99.95%) is higher than Epson Dual Station POS Printer (99.9%).

Font Alternatives

Toshiba offers more standard font choices than Epson.

Toshiba TCx™ Dual Station POS Printer	Epson Dual Station POS Printer
9 x 20 (Font C)	
	9 x 17
11 x 20 (Font A)	10 x 20
11 x 24 (Tall A)	
13 x 24 (Font B)	12 x 24

Table 6 – Font Choices

Media Handling

Toshiba and Epson support standard thermal paper widths and thicknesses. Toshiba supports a greater range of thermal paper thicknesses.

For the purposes of this paper, Slip refers to front-side (face) media handling and Endorsement refers to back-side or frank handling. Adjustment were made to Toshiba/Epson terminology to get them to match.

Epson Dual Station POS Printer has one thermal print head and two impact print heads. The face impact print head is similar to Toshiba, but Epson's frank print head is smaller and requires a different ribbon than the face.

Toshiba TCx™ Dual Station POS Printer can support a wider range of thermal and impact paper thicknesses, and Toshiba Slip and Endorsement operations can support 4-part multi-part forms while Epson Dual Station POS Printer Endorsement can only support 3-part multi-part forms.

Media Handling	Toshiba TCx™ Dual Station POS Printer	Epson Dual Station POS Printer
Receipt:		
Paper Width	80mm	80mm
Roll Diameter	83mm	83mm
Paper Thickness	40 – 99 µm	53 - 75 µm
Other:	Slip/Endorsement	Slip
Paper Thickness	0.08mm to 0.2mm	0.09mm to 0.22mm
Multi-Part Forms	Original plus 3; Thickness - 0.08mm to 0.48mm	Original plus 3; Thickness - 0.09mm to 0.22mm
Other (Epson Only):		Endorsement
Number of copies		Original & 2 copies

Table 7 – Media Handling

Barcodes

While both support most of the more popular barcodes, there are some exceptions.

Barcode	Toshiba TCx™ Dual Station POS Printer	Epson Dual Station POS Printer
2D Symbology	Yes	Yes
Aztec Code		Yes
CODABAR	Yes	Yes
CODE 128	Yes	Yes
CODE 39	Yes	Yes
CODE 93	Yes	Yes
Composite Symbology		Yes
Data Matrix		Yes
GS1 DataBar, Omni-Directional Stacked	Yes	
GS1 DataBar, Omni-Directional	Yes	Yes
GS1 DataBar Expanded	Yes	Yes
GS1 DataBar	Yes	
GS1-128		Yes
ITF	Yes	
JAN13 (EAN)	Yes	Yes
JAN8 (EAN)	Yes	
MaxiCode		Yes
PDF417	Yes	Yes
QR Code	Yes	Yes
UPC-A	Yes	Yes
UPC-E	Yes	Yes

Table 8 – Barcodes Supported



Economy

Paper Reduction

Toshiba TCx™ Dual Station POS Printer published maximum paper reduction is greater than 30%, while Epson Dual Station POS Printer is 47%. However, both manufacturers state that the reduction is fully dependent on what is being printed.

Font clarity, maximum paper reduction and paper reduction options were evaluated. The following tests were performed:

- 75% reduction off of default and font reduction
- 75% reduction off of default
- 50% reduction off of default
- Maximum font reduction for short, medium and long receipts.

Overall, font clarity was maintained for all tests of Toshiba and Epson printers.

Toshiba had a shorter receipt length in all instances, except for Max Reduction options where the receipt length was the same.

Reduced receipt length methodologies differed when evaluating how various parts of the receipt were affected by reduction, i.e., top border, logo, address block, receipt body and barcode. This is presented to show the parts of the printed receipt that are affected by reduction and to show how the two manufacturers execute paper reduction. Ultimately, the clarity of either manufacturer is not affected by the approach chosen.

Single Station Paper Reduction	Test Results	Treatment Differences
75% Off of Default + Font: <ul style="list-style-type: none"> • Image Clarity – relative clarity from one receipt vs the other; • Receipt Length – relative length from one receipt to another; • Reduction Treatment; 	Image Clarity - except for spacing, nearly identical. Reduction – Toshiba reduces receipt length by 36.8% vs. Epson which reduces length by 28.9%.	Treatment: Smaller for Toshiba: <ul style="list-style-type: none"> • Top Border • Logo • Address Block • Body Similar for both: <ul style="list-style-type: none"> • Barcode
50% Off of Default: <ul style="list-style-type: none"> • Image Clarity – relative clarity from one receipt vs the other; • Receipt Length – relative length from one receipt to another; 	Image Clarity - except for spacing, nearly identical. Reduction – Toshiba reduces receipt length by 31.6% vs. Epson which reduces length by 21.1%.	Treatment: Smaller for Toshiba: <ul style="list-style-type: none"> • Logo • Address Block • Body Similar for both: <ul style="list-style-type: none"> • Top Border • Barcode
75% Off of Default: <ul style="list-style-type: none"> • Image Clarity – relative clarity from one receipt vs the other; • Receipt Length – relative length from one receipt to another; 	Image Clarity - except for spacing, nearly identical. Reduction – Toshiba reduces receipt length by 36.8% vs. Epson which reduces length by 34.2%.	Treatment: Smaller for Toshiba: <ul style="list-style-type: none"> • Logo • Address Block • Body Similar for both: <ul style="list-style-type: none"> • Top Border • Barcode

Single Station Paper Reduction	Test Results	Treatment Differences
Max Change, Font, Short Receipt: <ul style="list-style-type: none"> Image Clarity – relative clarity from one receipt vs the other; Receipt Length – relative length from one receipt to another; 	Image Clarity - except for spacing, nearly identical. Reduction - Similar for both, 47.4% shorter	Treatment: Smaller for Toshiba: <ul style="list-style-type: none"> Logo Address Block Greater for Toshiba: <ul style="list-style-type: none"> Top Border Body Similar for both: <ul style="list-style-type: none"> Barcode
Max Change, Font, Medium Receipt: <ul style="list-style-type: none"> Image Clarity – relative clarity from one receipt vs the other; Receipt Length – relative length from one receipt to another; 	Image Clarity - except for spacing, nearly identical. Reduction - Similar for both, 48.3% shorter	Treatment: Smaller for Toshiba: <ul style="list-style-type: none"> Logo Body Greater for Toshiba: <ul style="list-style-type: none"> Top Border Similar for both: <ul style="list-style-type: none"> Barcode Address Block
Max Change, Font, Long Receipt: <ul style="list-style-type: none"> Image Clarity – relative clarity from one receipt vs the other; Receipt Length – relative length from one receipt to another; 	Image Clarity - except for spacing, nearly identical. Reduction - Similar for both, 46.7% shorter	Treatment: Smaller for Toshiba: <ul style="list-style-type: none"> Logo Body Greater for Toshiba: <ul style="list-style-type: none"> Top Border Similar for both: <ul style="list-style-type: none"> Barcode Address Block

Table 9 – Dual Station Paper Reduction Test Summaries

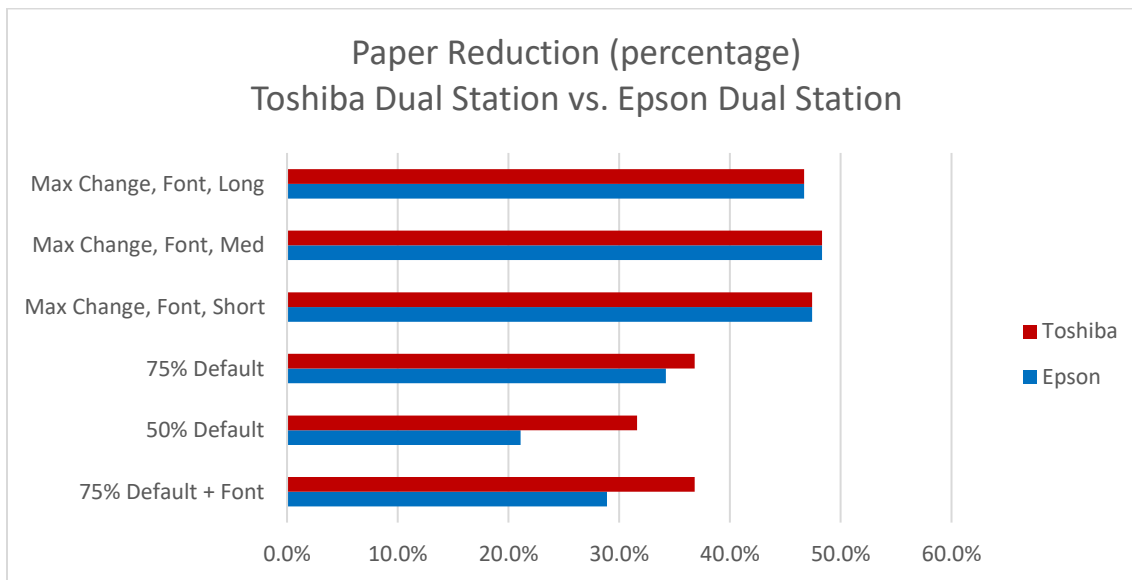


Chart 5 – Paper Reduction Results, Toshiba vs. Epson

Power

While both Toshiba and Epson use 24 VDC (volts direct current), As per Energy-Star certification documentation (7/19), there are differences in power usage based on operating mode.

Power Modes	Toshiba TCx™ Dual Station POS Printer	Epson Dual Station POS Printer
Operating	Varies based on data	Varies based on data
Sleep	0.50W	0.70W
Standby	0.05W	0.30W

Table 10 – Energy-Star Certifications

Toshiba TCx™ Dual Station POS Printer uses less power in sleep mode and in standby mode. However, the differences are not material, i.e., a difference of .25W translates to less than \$.17/year in power savings¹.



Serviceability

With the help of an experienced technician each system was examined for a first-hand experience on what is required to service each unit. A summary of results is presented in the tables below.

Component Life

Both Toshiba and Epson have the same published component life for thermal print head, and auto cutter.

Component	Toshiba TCx™ Dual Station POS Printer	Epson Dual Station POS Printer
Thermal head Life	200 km	200 km
Auto Cutter Life	3 million cuts	3 million cuts

Table 11 – Component Life

Paper Loading

To open the Epson Dual Station POS Printer thermal paper cover, you use a finger scoop on the side of the cover and pull the cover open. This differs from Toshiba TCx™ Dual Station POS Printer when you either push the button or pull the finger scoop on the left side and the cover opens all the way on its own due to a spring. The Epson printer requires that you lift the cover open, or it could slap back down.

¹ .00025KW difference between Toshiba vs Epson, 16 hours/day in standby, 7 days/week, 52 weeks/year, \$.12/KW hour national average: $.25/1000 \times 16 \times 7 \times 52 \times .12 = \$.17/\text{printer}/\text{year}$

Sensors

As indicated above, sensors provide immediate indication of operational issues as they occur. Some sensors indicate cover open, roll paper outages, roll paper low, auto cutter error, paper jam, and call for service.

Indicator	Toshiba TCx™ Dual Station POS Printer	Epson Dual Station POS Printer
Cover Open	Printer ready indicator – amber blinking	Error 1
Roll Paper Out	Yes	Paper is Out Indicator
Paper Low	Paper supply indicator – orange or blinking	
Insert or Remove Slip Paper	Document ready indicator – off or blinking	Slip Indicator
Auto Cutter Error	Yes	Error 1 + 2
Paper Jam		Error 1 + 3
Printing Stop by Cover Open	Printer ready indicator – amber blinking	Error 1 + 2 + 3
Call for Service	Yes for Print Head, Main Card and Interface	Paper is Out + Slip Indicators
Thermal Print Head Health	Remote Monitoring	Not included with Epson product
Impact Print Head Health	Remote Monitoring	Not included with Epson product

Table 12 – Sensors

Initially, the three light indicator panel on the Epson Dual Station POS Printer requires the use of a chart to determine what is wrong as there are various error conditions possible.

Epson remote monitoring requires customization with 3rd party applications.

Toshiba TCx™ Dual Station POS Printer has light-path management visual indicators to provide instant feedback that the main card, print head and interface adapter are functioning properly.

Besides the physical indicators noted above, Toshiba remote management monitors the following:

- Receipt Station Cover Sensor
- Document Station Cover Sensor
- Paper Low Sensor
- Paper Out Sensor
- Document Insert Sensors. There are 2 sensors.
- Cash Drawer Open detection.

Toshiba remote management monitors printer head health using a circuit in the printer:

- Thermal Print Head Health – Detects if any of the print elements are bad.
- Impact Print Head Health – Detects if any of the print wires are bad.

Cable Management

The access of I/O ports and preservation of cables is a critical part of the selection process. Both Toshiba TCx™ Dual Station POS Printer and Epson Dual Station POS Printer printers have one cable strain relief feature.



Architecture

Basic Construction

Design considerations affect printer life, operation and serviceability.

Architectural Aspect	Observations
Dimensions (WxDxH)	Both Toshiba (7.93" x 10.83" x 7.73") and Epson (7.32" x 10.95" x 7.13") have similar footprints.
Weight	Toshiba (9.22 lbs.), Epson (9.70 lbs.)
Printer Body	Both Toshiba and Epson use steel in their printer bodies to reinforce and extend the life of the single station printers.
Paper Access Cover	While both Toshiba and Epson have reinforced paper access covers, Epson requires two steps to open cover.
Latching	Both Toshiba and Epson have sturdy latching features.
Sensor Life/Accuracy	A visual comparison of the two printers showed that Toshiba's paper sensor design is immune to debris, making paper jams less likely to occur.
Front Face Design	Toshiba printer allows the printer to be tilted forward so it lies flat on the face. This enables hands-free access to the cable access ports for installation and servicing. Epson printer is not stable when put into this position.

Table 13 – Basic Construction

Toshiba's TCx™ Dual Station Printer is rated better than Epson Dual Station POS Printer due to the weight (.5lbs. lighter), one-step access to thermal paper and the sensor design that makes it immune to paper debris.



Table 14 – Indicators

Connectivity

Both printers support standard industry connectivity. Epson also supports Bluetooth, Beacon and NFC connectivity; Toshiba does not.

Connectivity Options	Toshiba TCx™ Dual Station POS Printer	Epson Dual Station POS Printer
USB 2.0	Yes	Yes
24V Powered USB	Yes	Yes
Ethernet (10/100BASE-T)	Yes	Yes
Wireless LAN (802.11a/b/g/n)	Yes	Yes
Beacon	No	Yes
NFC	No	Yes
Mobile Support - iOS	Yes	Yes
Mobile Support – Android	Yes	Yes
Mobile Support – Bluetooth	No	Yes
Mobile Support – Windows	Yes	Yes

Table 15 – Connectivity

OS Support

Both printers support standard OS such as Microsoft Windows (7.0, 8.1, 10) and Linux. Toshiba offers its own OS TCx Sky, as well as 4690 OS1. Epson additionally supports WEPOS, CentOS and Ubuntu.

Operating Systems	Toshiba TCx™ Dual Station POS Printer	Epson Dual Station POS Printer
Operating Systems:	Windows 10, 8.1,7; Linux (SLE11-SP3); POSReady 2009 (32 bit) POSReady 7 (32/64 bit) 4690 OS V6R5 TCx™ Sky	Microsoft® Windows 10, 8.1, 8.0, 7, Windows XP, Windows Vista®, Windows Server® 2012/2012 R2, 2008/2008 R2; Linux (Red Hat® Enterprise Linux, OPEN SUSE®); POSReady; WEPOS; CentOS®, Ubuntu®

Table 16 – OS

SW Drivers and Utilities

Both printers come with SW Drivers and Utilities. Epson supports Bluetooth, while Toshiba does not. Toshiba offers native windows driver and virtual serial port drivers while Epson does not.

SW Drivers and Utilities	Toshiba TCx™ Dual Station POS Printer	Epson Dual Station POS Printer
Native Windows Driver	Version 4.0 or later	Yes
Virtual Serial Port Drivers	Version 1.5 or later	Yes
POS Drivers	UPOS Version 1.14.3 or later (OPOS, JPOS)	ePOS Print/Display, OPOS & JPOS
Printer Configuration Utility	Yes	Yes, Server Direct Print,
Remote Management	Yes, manage inventory data, defined events, firmware/configuration updates across all devices at an enterprise level	Yes

Table 17 – Drivers/Utilities

Options

Each printer offers several options. Epson offers Connect-It interfaces (easily swap in and out). While Toshiba offers an inline Logo and Water Mark.

Options	Toshiba TCx™ Dual Station POS Printer	Epson Dual Station POS Printer
Connect-It Interfaces	No	Yes
Stored Graphics	Yes, 255	Yes, 256
Stored Messages	Yes, 255 Resident Messages	No
Water Mark	Yes	No
Customized Font	Yes (Fixed Size and Proportional)	Yes, User Defined Available
Inline Logo	Yes	No

Table 18 – Options

Evaluation

The evaluation of Toshiba TCx™ Dual Station POS Printer and Epson Dual Station Printer was quantified by assigning points to each printer based on the results within each comparison criterion. The point assignments and rationale are presented below.

Dual Printer Station Evaluation	Max Points	Toshiba	Epson	Points Awarded How?
Performance				
Printing Speed	12.0	12.0	-	6 trials, fastest gets 2 points in each trial
MICR Accuracy	1.0	1.0	-	1 point for most accurate
Clarity	12.0	12.0	2.0	6 trials, clearest gets 2 points in each trial
Font Alternatives	5.0	4.0	3.0	1 point for each font alternative
Media Handling	2.0	2.0	1.0	1 point for width and 1 for thickness
Barcode	2.0	1.5	1.6	Each type covered = .1 point
Performance Total	34.0	32.5	7.6	
Economy				
Paper Reduction	6.0	6.0	3.0	1 point awarded for best or matched trial
Power Usage	1.0	1.0	-	1 point awarded for each aspect
Economy Total	7.0	7.0	3.0	
Serviceability				
Component Life	4.0	4.0	4.0	2 components, each gets 2 points awarded
Paper Loading	1.0	1.0	-	Ease of loading paper, awarded 1 point
Sensors	2.0	1.8	1.4	.2 points for each aspect monitored
Cable Management	1.0	1.0	1.0	1 point for cable management
Serviceability Total	8.0	7.8	6.4	
Architecture				
Basic Construction	7.0	7.0	4.0	1 point awarded for each aspect
Connectivity	2.0	1.4	2.0	.2 points for each
OS Supported	3.0	3.0	3.0	2 points for standard OS; 1 point for additional
SW Drivers/Utilities	1.0	1.0	1.0	.2 points for each
Options	1.0	0.8	0.6	.2 points for each
Architecture Total	14.0	13.2	10.6	
Grand Total	63.0	60.5	27.6	

Table 19 – Evaluation Summary

Summary

When choosing a POS printer for retail, performance, economy, serviceability and architecture are important considerations. Edison evaluated two Dual Station printers, Toshiba TCx™ Dual Station POS Printer and Epson Dual Station POS Printer.

Overall, Toshiba TCx™ Dual Station POS Printer has been determined to be the better choice when compared to the Epson Dual Station POS printer when looking at Performance, Economy, Serviceability and Architecture.

The results, graphically presented below, show that Toshiba TCx™ Dual Station POS Printer scored 96% out of 100% overall while Epson Dual Station POS Printer scored 44% out of 100%.

Also note, Toshiba scored greater than Epson in all four rating categories.

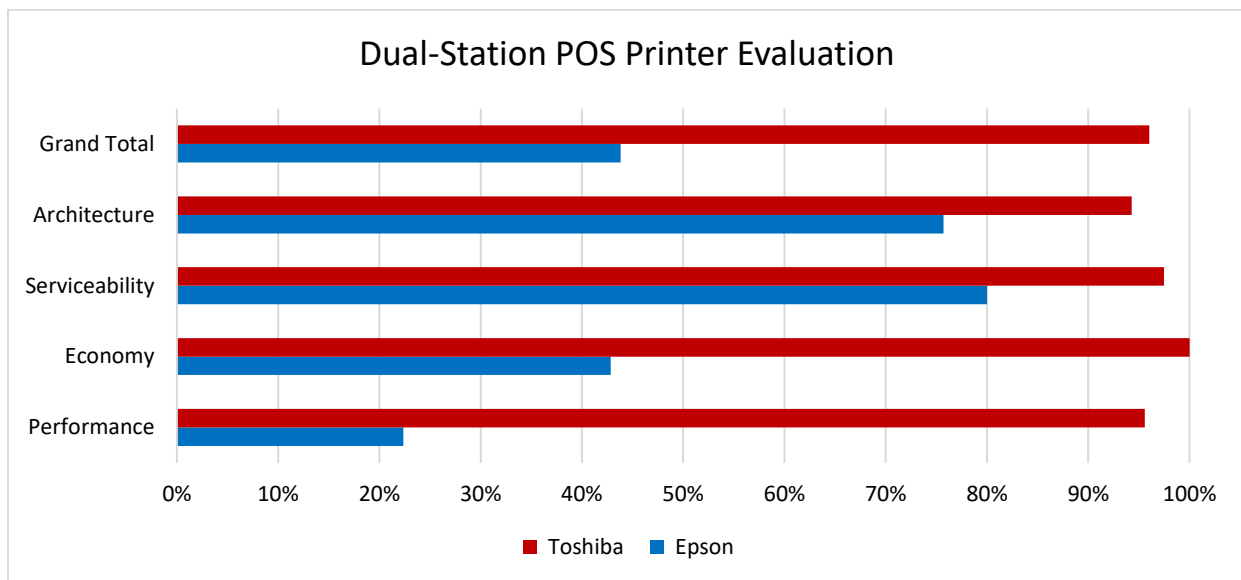


Chart 6 – Final Results

Performance

The greatest disparity between the two printers was in the area of performance as Toshiba TCx™ Dual Station POS Printer was faster in every test based on real-life conditions where the time to print short, medium and long receipts were compared.

The greatest disparity in performance was in check printing where Toshiba was almost twice as fast in two of three check processing tests even though Epson has two print heads that allow the check to print front and back without flipping the check over.

The second critical aspect of performance was in clarity where 206 DPI provided by Toshiba produced a clearer image in almost every test instance when compared to 180 DPI provided by Epson.

Economy

While Epson Dual Station published maximum reduction (47%) was greater than Toshiba TCx™ Dual Station POS Printer (30%+), the test results based on equivalent reduction input resulted in greater or equivalent paper savings for Toshiba.

Power differences were minimal and not material.

Serviceability

Toshiba TCx™ Dual Station POS Printer scored higher in this category due to enhanced paper loading access and sensor capabilities.

Paper loading access for Toshiba has two cover access points and is cover spring assisted vs. Epson which has one cover access point and no spring assist in cover. This is an indication of the in-depth understanding of the retail market and how their experience is reflected in the architecture and operation of their products.

Architecture

Toshiba TCx™ Dual Station POS Printer scored higher in basic construction over Epson Dual Station POS Printer since Epson was ½ pound heavier than Toshiba, and the Epson printer could not lay flat when placed on its face to service the back of the printer.

While Epson offered more connectivity options, it does not support inline logos, watermarks or resident messages.

In Summary

Overall, Toshiba TCx™ Dual Station POS Printer has been determined to be the better choice when compared to the Epson Dual Station POS printer when looking at Performance, Economy, Serviceability and Architecture.

Toshiba's experience in retail is very evident as they consistently deliver products that include operational and architecture elements to support high-traffic environments more efficiently and more effectively.