Panasonic

Panasonic Lighting Americas, Inc.
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Patent List:

Patent No.	Issued Date	Title
6,111,365	8/29/00	Fast Starting, Surge Limited, Electronic Ballast
6,137,239	10/24/00	Electronic Ballast with Selective Load Control
6,177,769	1/23/01	Electric ballast with Selective Power Dissipation
6,291,944	9/18/01	System & Method for Limiting Through-Lamp Ground Fault Currents in Non-Isolated Electronic Ballasts
6,333,605	12/25/01	Light Modulating Electronic Ballast
7,019,662	3/28/06	LED Drive for Generating Constant Light Output
7,132,803	11/7/06	High efficiency 4 lamp instant start ballast
7,239,094	7/3/07	Electronic Ballast with Adaptive Lamp Preheat and Ignition
7,247,998	7/24/07	Transient Detection of End of Lamp Life Condition Apparatus and Method.
7,391,168	6/24/08	Digital Control of Electronic Ballasts Using AC Power Lines as a Communication Medium
7,394,204	7/1/08	Zero crossing detection of line voltage/current of variable amplitude
7,432,660	10/7/08	IC-based low cost reliable electronic ballast with multiple striking attempts and end of lamp life protection
7,443,113	10/28/08	Software controlled electronic dimming ballast
7,679,294	3/16/10	Method and system to eliminate fluorescent lamp striations by using capacitive energy compensation
7,705,544	4/27/10	Lamp circuit with controlled ignition pulse voltages over a wide range of ballast-to-lamp distances
7,719,204	5/18/10	Method for controlling striations in a lamp powered by an electronic ballast
7,768,755	8/3/10	Over-voltage protection and automatic re-strike circuit for an electronic ballast
7,786,391	8/31/10	Ballast housing having rolled edge lead wire exit
7,843,141	11/30/10	Low cost step dimming interface for an electronic ballast
7,843,145	11/30/10	System and method for power line carrier communication using high frequency tone bursts
7,848,114	12/7/10	Ballast housing with an integral circuit board grounding device
7,889,463	2/15/11	Fused lead wire for ballast protection
7,923,942	4/12/11	Constant current source mirror tank dimmable ballast for high impedance lamps
7,952,303	5/31/11	Electronic ballast for a gas discharge lamp with controlled filament heating during dimming
7,977,894	7/12/11	Programmed start ballast for gas discharge lamps
7,990,243	8/2/11	Gull wing surface mount magnetic structure
8,002,445	8/23/11	LED luminaire with automatic luminance compensation

8,031,040	10/4/11	Magnetic component having a bobbin structure with integrated winding
8,035,308	10/11/11	Software controlled electronic dimming ballast
8,044,601	10/25/11	High voltage discharge lamp lighting device
8,084,952	12/27/11	Method and system to detect zero current conditions in an electronic ballast by monitoring voltage across a buck inductor
8,116,089	2/14/12	Method and apparatus for securing a magnetic component to a printed circuit board for soldering
8,129,920	3/6/12	Discharge lamp ballast and fixture with controlled preheating
8,138,679	3/20/12	Organic electroluminescent light emitting device for restoring normal operation after low-voltage errors
8,143,809	3/27/12	LED illuminating device
8,143,796	3/27/12	Electronic ballast with controlled filament preheating using half-wave lamp current detection
8,154,214	4/10/12	Switching power supply for an illumination device with precision current control
8,183,791	5/22/12	System and method for preventing low dimming current startup flash
8,193,727	6/5/12	Lamp end of life protection circuit and method for an electronic dimming ballast
8,198,824	6/12/12	Electronic ballast for restarting high-pressure discharge lamps in various states of operation
8,203,273	6/19/12	Ballast circuit for a gas discharge lamp that reduces a pre-heat voltage to the lamp filaments during lamp ignition
8,203,282	6/19/12	Electronic ballast with lamp end of life detection and protection circuits
8,207,690	6/26/12	High-pressure discharge lamp ballast with rapid lamp restart circuit
8,207,680	6/26/12	Discharge lamp ballast having an auto-transformer for high voltage detection
8,212,643	7/3/12	Bobbin for an inductive electronic component
8,222,835	7/17/12	Electronic ballast with adjustable filament preheating based on output current symmetry
8,222,834	7/17/12	HID lamp ballast with controlled DC step down circuit
8,228,003	7/24/12	Electronic ballast for an hid lamp with lamp re-start control
8,232,727	7/31/12	Ballast circuit for a gas-discharge lamp having a filament drive circuit with monostable control
8,232,741	7/31/12	Electronic ballast with controlled lamp preheating
8,242,870	8/14/12	Magnetic component with a notched magnetic core structure
8,253,351	8/28/12	Electronic ballast with multimode lamp power control
8,258,712	9/4/12	Ballast circuit for reducing lamp striations
8,274,234	9/25/12	Dimming ballast with parallel lamp operation
8,274,237	9/25/12	LED driver circuit with over-current protection during a short circuit condition

8,278,835	10/2/12	Modular electronic ballast
8,288,956	10/16/12	Lamp preheat circuit for a program start ballast with filament voltage cut-back in steady state
8,294,385	10/23/12	High-pressure discharge lamp ballast with multi-mode lamp starting circuit
8,299,727	10/30/12	Anti-arcing protection circuit for an electronic ballast
8,299,723	10/30/12	Electronic ballast with lamp flicker suppression during start-to-steady state transition
8,310,160	11/13/12	Anti-arcing circuit for current-fed parallel resonant inverter
8,319,447	11/27/12	Hid lamp ballast with multi-phase operation based on a detected lamp illumination state
8,324,813	12/4/12	Electronic ballast with frequency independent filament voltage control
8,324,829	12/4/12	Startup control for a high pressure discharge lamp ballast
8,330,382	12/11/12	Electronic ballast for correcting asymmetrical current flow across a gas discharge lamp
8,330,378	12/11/12	Illumination device and method for controlling a color temperature of irradiated light
8,339,056	12/25/12	Lamp ballast with protection circuit for input arcing and line interruption
8,344,628	1/1/13	Dimming electronic ballast with lamp end of life detection
8,350,678	1/8/13	Power line dimming controller and
8,354,795	1/15/13	Program start ballast with true parallel lamp operation
8,378,579	2/19/13	Ballast circuit for a gas discharge lamp with a control loop to reduce filament heating voltage below a maximum heating level
8,405,488	3/26/13	System and method for encoding ballast control signals
8,406,007	3/26/13	Magnetic circuit board connector component
8,427,074	4/23/13	PLC controller and discharge lighting ballast receiver with high noise immunity
8,441,203	5/14/13	Dimming electronic ballast for true parallel lamp operation
8,449,145	5/28/13	Mounting apparatus for a light emitting diode module
8,450,946	5/28/13	Zone addressing circuit for an electronic ballast
8,471,475	6/25/13	Modular dimming ballast with decoupled half-bridge topology
8,482,944	7/9/13	Electronic ballast with inrush protection circuit
8,498,124	7/30/13	Magnetic circuit board stacking component
8,536,801	9/17/13	System and method for individually modulating an array of light emitting devices
8,564,216	10/22/13	Asymmetric end-of-life protection circuit for fluorescent lamp ballasts
8,581,497	11/12/13	Electronic ballast circuit and method for detecting removal of parallel connected lamp filaments in low level dimming
8,593,078	11/26/13	Universal dimming ballast platform
8,638,042	1/28/14	System and method for regulating an open circuit voltage of an HID lamp ballast

8,654,485	2/18/14	Electronic ballast with protected analog dimming control interface
8,680,776	3/25/14	Lighting device including a fast start circuit for regulating power supply to a PFC controller
8,699,244	4/15/14	Electronic ballast with load-independent and self-oscillating inverter topology
8,698,424	4/15/14	Power line dimming controller and receiver
8,716,937	5/6/14	Lighting ballast with reduced filament drive and pin current balancing
8,847,750	9/30/14	Network of dual technology occupancy sensors and associated lighting control method
8,847,512	9/30/14	Program start ballast having resonant filament heating circuit with clamped quality factor
8,896,213	11/25/14	Adaptive lamp warm up control for dimming ballast based on lamp impedance sensing
8,909,382	12/9/14	Occupancy detection system and method having automatic adaptation capabilities
8,922,131	12/30/14	Series resonant inverter with capacitive power compensation for multiple lamp parallel operation
8,928,250	1/6/15	Method and circuit for LED load management
8,928,236	1/6/15	LED driver circuit with unified controller
8,947,015	2/3/15	Indirect line voltage conduction angle sensing for a chopper dimmed ballast
8,947,020	2/3/15	End of life control for parallel lamp ballast
9,055,651	6/9/15	Circuit and method for monitoring and reporting the remaining useful life of an LED module
9,066,406	6/23/15	LED driver and protection circuit for output short conditions
9,093,212	7/28/15	Stacked step gap core devices and methods
9,095,022	7/28/15	Constant current driver based on critical condition mode buck converter
9,099,333	8/4/15	LED lamp device having a fluorescent element shaped 12/878,168for uniform light conversion
9,115,877	8/25/15	Mounting apparatus for a light emitting diode module
9,125,250	9/1/15	Constant current control based on indirect current sensing for critical conduction mode buck converter
9,125,252	9/1/15	Power line communication system and method for control of lamp dimming
9,125,259	9/1/15	Constant current drive circuit for multi-channel LED lighting
9,136,054	9/15/15	Reduced leakage inductance transformer and winding methods
9,173,256	10/27/15	Dimmable LED driver based on parallel resonant current fed self-oscillating topology
9,183,974	11/10/15	Bobbin apparatus for reducing gap losses in magnetic components
9,190,830	11/17/15	Overcurrent protection circuit and method for an LED driver
9,203,321	12/1/15	Non-isolated resonant DC-DC converter with boost-type voltage doubler output
9,234,650	1/12/16	Asymmetric area lighting lens

9,236,179	1/12/16	Magnetic component apparatus with interconnectable bobbins
9,237,613	1/12/16	Constant current control for an LED driver circuit using a microcontroller-based oscillator controlled by a differential error feedback signal from a proportional and integration control loop
9,237,617	1/12/16	LED driver with inherent current limiting and soft startup capability
9,237,621	1/12/16	Current control circuit and method for floating IC driven buck-boost converter
9,237,625	1/12/16	Driver circuit with a common interface for negative temperature coefficient resistor and bi-metallic strip temperature sensing
9,237,636	1/12/16	Self-clamped resonant filament heating circuit
9,240,726	1/19/16	Dimming LED driver circuit with dynamically controlled resonant tank gain
9,279,564	3/8/16	Indirect area lighting apparatus and methods
9,293,246	3/22/16	Magnetic component with integrated component circuit board
9,295,143	3/22/16	Wireless controlled lighting system with shared signal path on output wires
9,295,145	3/22/16	Multifunction magnetic device with multiple cores and coils
9,307,623	4/5/16	Method to control striations in a lamp powered by an electronic ballast
9,307,587	4/5/16	Constant current source based on self-oscillation soft-switching LLC convertor topology
9,462,655	10/4/16	Circuit and method for monitoring functionality of an electronic surge suppressor
9,459,396	10/4/16	Linear indirect LED lighting system
9,363,862	6/7/16	Automatic current and reference gain control for wide range current control
9,362,044	6/7/16	Magnetic component with multiple pin row bobbin
9,370,061	6/14/16	High power factor constant current buck-boost power converter with floating IC driver control
9,369,050	6/14/16	Indirect current sensing method for a constant current flyback converter
9,379,533	6/28/16	Input surge protection circuit and method for an LED load
9,396,865	7/19/16	Magnetic component with auxiliary winding circuit board
9,401,237	7/26/16	Core passage step apparatus and methods
9,420,670	8/16/16	Controller and receiver for a power line communication system
9,419,514	8/16/16	High power factor DC power supply with variable gain converter and fast-averaging control loop
9,416,951	8/16/16	Compact indirect lighting system with improved thermal performance
9,431,893	8/30/16	Stability control of a power factor correction circuit using adaptive multiplier voltage feedback
9,435,527	9/6/16	Thermal venting apparatus and method for LED modules

9,459,396	10/4/16	Linear indirect LED lighting system
9,462,655	10/4/16	Circuit and method for monitoring functionality of an electronic surge suppressor
9,480,126	10/20/16	Method to detect uneven AC load or parallel load removal
9,518,716	12/13/16	Linear wide area lighting system
9,520,711	12/13/16	Gate drive integrated circuit with input line overvoltage protection for a half-bridge power converter
9,521,724	12/13/16	Method for automatically commissioning devices used in building lighting and controls
9,577,540	2/21/17	Multi-stage flyback converter for wide input voltage range applications
9,583,073	2/28/17	Adaptive startup method for constant current LED drivers
9,583,852	2/28/17	PCB holder having a leg with a passageway with a conductive pin therein to electrically connect two PCBs
9,618,164	4/11/17	Adapter for retrofitting LED lamps, method of use, and lighting fixture with retrofit adapter
9,629,206	4/18/17	Reducing output ripple current and protecting inverter switches during non-zero voltage switching for isolated buck converters
9,629,209	4/18/17	Offline tuning interface for LED drivers
9,644,833	5/9/17	Encapsulated LED lighting module with integral gas venting
9,645,597	5/9/17	Circuit and method for indirectly sensing current and voltage in a floating output power supply
9,648,678	5/9/17	LED driver circuit with dimming control and programming interfaces
9,668,309	5/30/17	LED driver providing constant output power across a wide output voltage and current range
9,674,907	6/6/17	Input surge protection circuit and method for a non-isolated buck-boost LED driver
9,680,244	6/13/17	Header apparatus for providing electrical connection to a printed circuit board, and daughter card and circuit assembly incorporating the header apparatus
9,681,512	6/13/17	Combined wireless voltage controlled dimming interface for an LED driver
9,681,520	6/13/17	Photosensor employing a fiber optic collector
9,683,717	6/20/17	Asymmetric area lens for low-profile lighting system
9,689,554	6/27/17	Asymmetric area lighting lens
9,693,404	6/27/17	Negative current sensing method for multi-channel LED driver
9,693,411	6/27/17	LED driver configuration and dimming interface for dynamic adjustment of driver operating parameters
9,719,662	8/1/17	Thin-form lens for volume lighting applications
9,721,716	8/1/17	Magnetic component having a core structure with curved openings
9,723,667	8/1/17	Output tuning and dimming interface for an LED driver
9,723,695	8/1/17	Power line communication method and apparatus using downstream current modulation

9,756,703	9/5/17	Lighting control system and method for communication of short messaging
9,769,890	9/19/17	Circuit and method for eliminating power-off flash for LED drivers
9,769,896	9/19/17	LED driver with offline tuning interface using hot and neutral inputs
9,787,195	10/10/17	Primary current sensing method for isolated LED driver
9,788,430	10/10/17	Stacked magnetic assembly
9,799,442	10/24/17	Magnetic core structures for magnetic assemblies
9,801,262	10/24/17	Conduit knockout interface device for connecting a power over ethernet cable to an LED luminaire
9,805,859	10/31/17	Magnetic component with elevated bobbin
9,807,830	10/31/17	LED driver circuit with step configurable output
9,816,681	11/14/17	Side lit indirect flexible lighting system
9,820,351	11/14/17	Circuit and method for abnormal fault testing in an LED driver
9,826,583	11/21/17	Auxiliary power supply with dynamically adjustable output
9,835,322	12/5/17	Flow through extended surface troffer system
9,837,194	12/5/17	Output transformer and resonant inductor in a combined magnetic structure
9,837,913	12/5/17	Control method to avoid capacitive mode switching for resonant converters
9,842,683	12/12/17	Bobbin and E-Core assembly configuration and method for E-cores and EI-cores
9,844,118	12/12/17	AC LED drive circuit
9,894,718	2/13/18	Constant current source LED driver circuit with self-clamped output.
9,913,346	3/6/18	Surge protection system and method for an LED driver
9,913,354	3/6/18	Unpowered tuning interface circuit for an LED driver
9,974,129	5/15/18	Circuit and method for LED current regulation and ripple control
9,974,147	5/15/18	Integrated LED driver for wireless communication
9,978,496	5/22/18	Stacked magnetic assembly
9,980,328	5/22/18	Apparatus, system, and method for configuring an unpowered LED driver using an RS-232 interface
9,980,396	5/22/18	Low profile magnetic component apparatus and methods
9,991,045	6/5/18	Bobbin and core assembly configuration and method for E-core and I-core combination
10,004,123	6/19/18	Failure detection and alerting circuit for a differential mode surge protection device in an LED driver
10,039,159	7/31/18	AC LED driver with capacitive switching
10,041,984	8/7/18	Input voltage sense circuit for boost power factor correction in isolated power supplies
10,045,451	8/7/18	Lighting control system, expansion pack, and method of use
10,083,790	9/25/18	Method and apparatus for attaching magnetic components to printed circuit boards

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Products & Supporting Patents

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B244I120HE

8,212,643

B244I277HE-A

7,786,391
8,212,643

Panasonic

Panasonic Lighting Americas, Inc.
51 Century Blvd, Suite 230, | Nashville, TN 37214

B244IUNVHE-A
7,786,391

B254IUNV-E
7,132,803

B254P347-D
7,432,660

B254P3SV3PLD
8,278,835

B254PUDV3PLD
8,278,835

B254PUNVD
8,339,056

B254PUNV-D
8,288,956

B254PUNVDR
7,923,942

B254PUNVDR-D
7,098,608
7,843,145
8,278,835
8,405,488
8,450,946

B254PUNVPL-A
7,786,391
9,307,623

B254PUNVPLHB-A
9,307,623

B254PUNVSV3
7,923,942

B259IUNVEL
7,719,204

B259IUNVEL-A
7,786,391
8,212,643

B259IUNVHE
7,719,204

B259IUNVHE-A
7,786,391
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B259IUNVHP
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B259IUNVHP-A
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B260I120M-A
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B260I120RH
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B260IUNVHP
7,719,204

B328PUNVS30-A
8,278,835

B332I120L-A
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B332I277L-A
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B332I277RHU-A
7,786,391

B332IHRVHB-E
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B332IUNVEL-A
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B332IUNVHE-A
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B332IUNVHEH-A
7,786,391
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B332IUNVHP-A
7,786,391
8,212,643

B332IUNVLC-A
7,786,391
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B332PUNVDR-A
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8,450,946

B332PUNVDRH-E
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8,405,488
8,450,946

B332PUNVDRL-A
7,843,145
8,278,835
8,405,488
8,450,946

B332PUNVEL-A
7,786,391
8,324,813

B332PUNVHE-A
7,786,391
8,212,643
8,324,813
8,699,244

B332PUNVHEH
8,299,727
8,354,795
8,593,078

B332PUNVHEH-A
8,324,813

B432I120L-A
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B432I120RC-A
7,786,391
8,212,643

B432I120RCL-A
7,786,391
8,212,643

B432I120RES-A
7,786,391

B432I120RH-A
7,786,391
8,212,643

B432I277L-A
7,786,391

B432I277RH-A
7,786,391

B432IUNVEL-A

7,786,391
8,212,643

B432IUNVHE-A

7,786,391

B432IUNVHP-A

7,786,391
8,212,643

B432IUNVHP-A/277RH-A

8,212,643

B432IUNVLC-A

7,786,391
8,212,643

B432PUNVDR-E

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8,450,946

B432PUNVDRL-E

7,843,145
8,278,835
8,405,488
8,450,946

B432PUNVEL-A

8,212,643
8,324,813

B432PUNVHE-A

8,212,643
8,324,813

B432PUNVHE-E

8,699,244

B432PUNVHEH

8,299,727
8,354,795
8,593,078

B432PUNVHEH-A

9,307,623

B432PUNVHEH-E

8,212,643

B454PUNVDR-E

8,278,835

B454PUNV-E

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9,237,636
9,307,623
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B454PUNVHB-E

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9,237,636
9,805,859

B454PUNVHE-E

9,480,126

B454PUNVPL-E

8,922,131
9,183,974
9,307,623

B454PUNVPLHB

8,922,131

B454PUNVPLHB-E

9,307,623

BB232PUNVDFH-A

7,952,303

BB232PUNVDY-A

7,952,303

BB232PUNVDYH-A

7,952,303

BB232PUNVDYL-A

7,952,303

C213UNVDV3ME

8,278,835
8,339,056

C213UNVME

7,432,660

C213UNVSV3ME

7,098,608
8,183,791
8,278,835
8,339,056

C218UNVDV3ME

8,278,835
8,339,056

C218UNVME

7,432,660

C218UNVSV3ME

7,098,608
8,183,791
8,278,835
8,339,056

C226UNVDV3ME

8,278,835
8,339,056

C226UNVSV3ME

7,098,608
8,183,791
8,278,835
8,339,056

C240PUNVDR-A

7,098,608
7,786,391
7,843,145
8,405,488
8,450,946

C240PUNVHP-B

7,786,391

C240SI120RH

7,247,998
8,212,643

C240SI277RH

7,247,998
8,212,643

C2642UNV

8,203,273

C340SI120RH

8,212,643

C340SI277RH

8,212,643

CCM-BAC-PRG

7,843,145

D060C03250-SQ020C

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D10CC150HV10F

9,093,212

9,237,613
9,520,711
9,837,913
9,913,346

D10CC150HV10FL

9,401,237

D10CC150HVT-F

9,093,212
9,237,613
9,520,711
9,837,913
9,913,346

D10CC150HVx-F

8,680,776
8,716,937
8,928,236
8,928,250

D10CC150UV10F

8,212,643
9,237,613
9,520,711
9,837,913
9,913,346

D10CC150UV-F

8,212,643

D10CC150UVT-F

8,212,643
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9,401,237
9,520,711
9,837,913
9,913,346

D10CC150UVT-FJ

8,212,643

D10CC150UVx-F

8,680,776
8,716,937

D10CC30347TWx-X

9,237,613
9,583,073
9,668,309
9,769,890
9,820,351
9,826,583

D10CC30UNVD-C

9,237,613

D10CC30UNVPW-C

9,894,718
10,083,790

D10CC30UNVPW-L

9,894,718

D10CC30UNVPWX12-C

10,083,790

D10CC30UNVPWX24-C

10,083,790

D10CC30UNVPWX-C

9,894,718

D10CC30UNVPWX-K

9,894,718

D10CC30UNVTW-C

9,237,613
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9,668,309
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9,826,583

D10CC30UNVTWL

9,237,613
9,583,073
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9,769,890
9,826,583

D10CC30UNVTW-L

9,237,613
9,583,073
9,668,309
9,769,890
9,826,583

D10CC30UNVTZ-C

9,237,613
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9,769,890
9,826,583

D10CC30UVPID12-C

10,045,451

D10CC30UVPID24-C

10,045,451

D10CC42UNVA-A

9,237,613

D10CC42UNVS-A

7,786,391
9,237,613

D10CC55347TW-C

9,237,613
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9,668,309
9,769,890
9,820,351
9,826,583

D10CC55347TW-K

9,237,613
9,583,073
9,668,309
9,769,890
9,820,351
9,826,583

D10CC55347TZ-C

9,237,613
9,583,073
9,668,309
9,769,890
9,820,351
9,826,583

D10CC55UNVA-C

9,237,613

D10CC55UNV-C

9,237,613

D10CC55UNVD-C

9,237,613

D10CC55UNVT-C

8,654,485
9,237,613

D10CC55UNVTW-C

9,237,613
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9,826,583

D10CC55UNVTZ-C

9,237,613
9,583,073
9,668,309
9,769,890
9,826,583

D10CC60UNVA-V

9,066,406
9,190,830

D10CC60UNV-V

9,363,862

D10CC60UNVV-V

9,066,406
9,190,830

D10CCT180UVT-F

9,125,259

D12V60UNV-A

7,786,391
8,084,952

D12V60UNV-Q

8,084,952

D14CC150HVT-F

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D14CC150HVx-F

8,680,776
8,716,937
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D14CC150UV10F

8,212,643
9,237,613

D14CC150UVT-F

8,212,643
9,237,613
9,401,237
9,520,711
9,837,913
9,913,346

D14CC150UVx-F

8,680,776
8,716,937

D15CC55347TW-C

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9,826,583

D15CC55347TW-K

9,237,613
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9,826,583

D15CC55347TZ-C

9,237,613
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D15CC55UNVA-C

9,237,613

D15CC55UNVD-C

9,237,613

D15CC55UNVPA12-FS

9,913,354

D15CC55UNVPA24-FS

9,913,354

D15CC55UNVPW12-C

10,083,790

D15CC55UNVPW24-C

10,083,790

D15CC55UNVPW-C

9,894,718
10,083,790

D15CC55UNVPW-L

9,894,718

D15CC55UNVPWX-C

9,894,718

D15CC55UNVPWX-K

9,894,718

D15CC55UNVT-C

8,654,485
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D15CC55UNVTW-C

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9,826,583

D15CC55UNVTW-L

9,237,613
9,583,073
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9,769,890
9,826,583

D15CC55UNVTZ-C

9,237,613
9,583,073
9,668,309
9,769,890
9,826,583

D15CC55UVPA12-FS

9,837,194

D15CC55UVPA24-FS

9,837,194

D15CC55UVPID12-C

10,045,451

D15CC55UVPID24-C

10,045,451

D21CC80347TW-D

9,237,613

9,583,073
9,668,309
9,769,890
9,820,351
9,826,583

D21CC80347TZ-D

9,237,613
9,583,073
9,668,309
9,769,890
9,820,351
9,826,583

D21CC80UNVPW-C

9,894,718
10,083,790

D21CC80UNVPWX12-D

10,083,790

D21CC80UNVPWX24-D

10,083,790

D21CC80UNVPWX-D

9,894,718

D21CC80UNVTW-D

9,237,613
9,583,073
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9,826,583

D21CC80UNVTZ-D

9,237,613
9,583,073
9,668,309
9,769,890
9,826,583

D21CC80UVPID12-D

10,045,451

D21CC80UVPID24-D

10,045,451

D23CC90HRVT-F

9,237,613

D23CC90UNVT-F

9,203,321
9,237,613

D24V100UNV-A

7,786,391
8,084,952

D24V100UNV-Q

8,084,952

D28CC95UVPA12-F

9,837,194
9,913,354

D28CC95UVPA12-FS

9,913,354
9,978,496

D28CC95UVPA12-VF

9,837,194
9,913,354
9,978,496

D28CC95UVPA12-VJ

9,913,354
9,978,496

D28CC95UVPA24-F

9,837,194
9,913,354

D28CC95UVPA24-FS

9,913,354
9,978,496

D28CC95UVPA24-VF

9,837,194
9,913,354
9,978,496

D28CC95UVPA24-VJ

9,913,354
9,978,496

D530C150HV10F

9,093,212
9,237,613
9,520,711
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9,913,346

D530C150HV-F

9,093,212
9,237,613

9,520,711
9,837,913
9,913,346

D530C150HVT-F

9,093,212
9,237,613
9,520,711
9,837,913
9,913,346

D530C150HVx-F

8,680,776
8,716,937
8,928,236
8,928,250

D530C150UV10F

9,237,613
9,520,711
9,837,913
9,913,346

D530C150UV-F

9,520,711
9,837,913
9,913,346

D530C150UVT-F

9,237,613
9,401,237
9,520,711
9,837,913
9,913,346

D530C150UVx-F

8,680,776
8,716,937

D530CC150UV10F

8,212,643

D530CC150UVF

8,212,643

D530CC150UVT-F

8,212,643

D700C120UVT-V

9,237,613

D700C120UVx-V

9,190,830

D700C150HV10F

9,093,212
9,237,613
9,520,711
9,837,913
9,913,346

D700C150HV10FL

9,401,237

D700C150HVT-F

9,093,212
9,237,613
9,520,711
9,837,913
9,913,346

D700C150HVx-F

8,680,776
8,716,937
8,928,236
8,928,250

D700C150UV10F

8,212,643
9,237,613
9,520,711
9,837,913
9,913,346

D700C150UV-F

8,212,643

D700C150UVT-F

8,212,643
9,237,613
9,401,237
9,520,711
9,837,913
9,913,346

D700C150UVT-FJ

8,212,643

D700C150UVx-F

8,680,776
8,716,937

D700C20UNVPW-C

9,894,718
10,083,790

D700C20UNVPW-L

9,894,718

D700C20UNVPWX12-C

10,083,790

D700C20UNVPWX24-C

10,083,790

D700C20UNVPWX-C

9,894,718

D700C20UNVPWX-K

9,894,718

D700C30347TW-C

9,237,613
9,583,073
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9,826,583

D700C30347TW-K

9,237,613
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9,668,309
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9,820,351
9,826,583

D700C30347TZ-C

9,237,613
9,583,073
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D700C30UNVD-C

9,237,613

D700C30UNVTW-C

9,237,613
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9,769,890
9,826,583

D700C30UNVTZ-C

9,237,613
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9,826,583

D700CT160UVT-F

9,125,259

DCLBAC-LP1206

8,405,488

DCLBAC-LP1209

8,405,488

DCLBAC-LP1212

8,405,488

ESB216-12

8,212,643

ESB432-14

8,212,643

L12V60UNV-A

8,084,952

L12V60UNV-Q

8,084,952

L24V100UNV-A

8,084,952

L24V100UNV-Q

8,084,952

LP12DCLUNV-06

7,843,145
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LP12DCLUNV-12

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M7012-27CK-6EU-F

8,319,447

M7012-27CK-6EU-J

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M7012-27CK-6EU-JT3

8,319,447

MC20DCLUNV

7,394,204
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8,405,488

MC20DCLUNVDY

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S332I600

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SC20DCLUNV

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SC20DCLUNVDY

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SLI259IUNVHPA

7,786,391

W3V-DF-254ND

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8,450,946
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8,581,497
8,593,078
8,896,213

W3V-DL-254ND

8,278,835

W3V-DX-254ND

8,278,835

WDR-DF-232NA

7,843,145
8,405,488
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WDR-DF-332LA

7,843,145
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8,471,475
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WDR-DF-332NA

7,843,145
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WDR-DF-332NE

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WDR-DF-432NE

7,843,145
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WDR-LP12-00

7,843,145
8,405,488

WDR-LP12-04

7,843,145
8,405,488

WDR-LP12-12

8,405,488

WDY-CCM20

7,394,204
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8,405,488

WDY-DF-232NA

7,843,145
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8,471,475
8,581,497
8,593,078
8,896,213

WDY-DF-ACM

7,843,145
8,405,488
8,450,946
8,471,475

WDY-LP12BAC08

7,843,145
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WDY-LP12BAC10

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WDY-LP12BAC12

7,843,145
8,405,488

WDY-SC-CCM20

8,405,488

WRV-CCM20

7,394,204
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WRV-CCMBAC

7,394,204
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8,405,488

WRV-DF-232HA

7,952,303
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8,450,946
8,471,475
8,581,497
8,593,078
8,896,213

WRV-DF-232NA

7,843,145
7,952,303
8,278,835
8,405,488
8,450,946
8,471,475
8,581,497
8,593,078
8,896,213

Panasonic

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51 Century Blvd, Suite 230, | Nashville, TN 37214

WRV-DL-254ND

8,278,835

8,405,488

WRV-DX-232HA

8,278,835

WRV-DX-232NA

8,278,835

WRV-LP14X2003

7,843,145

8,405,488

WRV-LP14X2004

8,405,488

WRV-LP14X2008

8,405,488

WRV-LP14X2009

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8,405,488

WRV-LP14X2014

7,843,145

8,405,488

WRV-LP-232HA

7,786,391

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8,405,488

WRV-LP-232NA

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WRV-PS-232HA

7,786,391

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WRV-PS-232NA

7,786,391

8,278,835

WRV-SC-CCM20

7,843,145

8,405,488

WRV-SC-CCMBAC

7,843,145

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WTDCL21

8,405,488

WTDCL51

7,843,145

8,405,488

WUV-DF-254ND

7,843,145

7,952,303

8,405,488

8,450,946

8,471,475

8,581,497

8,593,078

8,896,213

WUV-DL-254ND

8,278,835

WUV-DX-254ND

8,278,835

8,405,488

8,450,946

8,471,475

8,581,497

8,593,078

8,896,213