

HID Headlight AFL

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HID Headlight AFL

VISHAY components used for HID Headlight/AFL applications include:

- HEXFET Power MOSFETS
 - TVS
 - Rectifier Diodes
 - Schottky Diodes
 - Fast Switching Diodes
 - LEDs
 - Film Capacitors
 - Multilayer Ceramic Capacitors
 - Aluminum Electrolytic Capacitors
 - Thick Film Chip Resistors
 - Power Shunt Resistors
 - NTC Thermistors
 - Power Storage Inductors
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Application Overview

The market for xenon and bi-xenon high-intensity discharge (HID) lighting is growing. Bi-xenon means that only one xenon light source is used to create both low and high beams via a mechanical shutter. Vishay supports xenon and bi-xenon HID applications with a variety of discrete electronic components. The ballasts and motor controls for headlight leveling (HLL) and advanced front lighting (AFL) controllers need discrete components. Improved visibility and safety on the road are the reasons for the success of gas discharge lamps (xenon). Because its very fast reaction time improves safety, LED technology is used for tail lights. In the future, LEDs will be used more and more for headlights because of their design flexibility, energy-savings, and very long lifetimes.

HID Headlight AFL : AFL / HLL MOTOR DRIVE, H-Bridge

Alu Elcaps

Product Name	Status	Description	Features	Package	Q-Level
140CLH		Aluminum capacitors, SMD (chip); high temperature capable;	10 μ F - 680 μ F; life at 125 °C = 2000 h;	SMD max. 10x10x14mm	
140RTM		Aluminum capacitors, radial; high temperature, miniature;	22 μ F - 4700 μ F; life at 125 °C = 2000 h;	TH / Radial max.18x31mm	
150CLZ		Aluminum capacitors, SMD (chip); very low Z;	33 μ F - 1000 μ F; life at 105 °C = 2000 h;	SMD max.10x10x14mm	
150RMI		Aluminum capacitors, radial miniature; low impedance;	100 μ F - 6800 μ F; life at 105°C = 10000 h;	TH / Radial max.18mm x 31mm	
153CRV		Aluminum capacitors, SMD (chip); long life, vertical, Pb-free;	22 μ F - 4700 μ F; life at 125°C = 4000h	SMD max.18x31mm	

Inductors

Product Name	Status	Description	Features	Package	Q-Level
IHLP5050FD-01		Low-profile, high-current, shielded; low DCR, high saturation;	0.1 μ H - 10 μ H; IDC = 120A - 15.5A	SMD 5050	

MOSFETs

Product Name	Status	Description	Features	Package	Q-Level
SQ7414EN	NEW	Low gate charge, low thermal resistance; high-current, LS-/HS-switch, N-/P-Ch; AEC Q-101 qualified	N-Channel; 60V; rDS(on) = 0.025Ohms;	SMD PowerPAK1212-8	AEC Q101
SQ7415EN	NEW	Low gate charge, low thermal resistance; high-current, LS-/HS-switch, N-/P-Ch; AEC Q-101 qualified	P-Channel; 60V; rDS(on) = 0.065Ohms;	SMD PowerPAK1212-8	AEC Q101

Shunt Resistors

Product Name	Status	Description	Features	Package	Q-Level
WSH2818	NEW	High-power, molded; current-sense Power Metal Strip	5W; R001 - R1; 1%; TCR <= 75ppm;	SMD 2818	AEC Q200
WSL2726	NEW	Power Metal Strip shunts, low R-Value; very low TCR, low thermal EMF;	R001 - R5; 1 %; TCR <= 75ppm;	SMD 2726	AEC Q200
WSL2816		Power Metal Strip shunts, low R-Value; very low TCR, low thermal EMF;	R001 - R5; 1 %; TCR <= 75ppm;	SMD 2816	AEC Q200
WSL3921	NEW	Power Metal Strip shunts; very low R-value, very low TCR; low thermal EMF	R0002 - R04; 1 %; TCR <= 75ppm;	SMD 3921	AEC Q200
WSLT2512	NEW	Power Metal Strip shunt; high-temperature (275 °C), low TCR; low thermal EMF	R01 - R50; 1%; TCR <= 75ppm;	SMD 2512	AEC Q200

Thermistors

Product Name	Status	Description	Features	Package	Q-Level
NTCS0603E4		Small dimension, rugged construction; high reliability;	4K7 - 100K Ω ; 1%; Beta = 2000 - 6000; 1%;	SMD 0603	

Thick Film Resistors

Product Name	Status	Description	Features	Package	Q-Level
CRCW0603		Bulk resistors, pulse resistant; good long-term stability;	1R - 10M Ω ; 1%; TCR = 100	SMD 0603	AEC Q200
CRWC0805		Bulk resistors, pulse resistant; good long-term stability;	1R - 10M Ω ; 1%; TCR = 100	SMD 0603	

HID Headlight AFL : BALLAST, Discharge Resistors

Wire Wound Resistor

Product Name	Status	Description	Features	Package	Q-Level
WSZ6720		Up to 4 W, cemented, high surge current; low cost;	1.8 W; 1R - 510R; Tol. = 1 % - 10 %;	SMD 6720	
WSZ7532		Up to 4 W, cemented, high surge current; low cost;	P = 3.75 W; 1R - 15K Ω ; Tol. = 1%, 3%, 5%, 10 %;	SMD 7532	

HID Headlight AFL : BALLAST, EMI Filtering

Inductors

Product Name	Status	Description	Features	Package	Q-Level
IHLP2525EZ-01		Low-profile, high-current; high transient spike capable; shielded, low-DCR	0.56 - 10 μ H; IDC=12A-4.5A	SMD 2525	
IHLP4040DZ-01		Low-profile, high-current; high transient spike capable; shielded, low-DCR	0.19 - 10 μ H; IDC=90A-12A	SMD 4040	
IHLP5050FD-01		Low-profile, high-current; high transient spike capable; shielded, low-DCR	0.1 μ H - 10 μ H; IDC = 120A - 15.5A	SMD 5050	

HID Headlight AFL : BALLAST, Filter Capacitors

Alu Elcaps

Product Name	Status	Description	Features	Package	Q-Level
150 CLZ		Aluminum capacitors, SMD (chip); very low Z;	33 μ F - 1000 μ F;	SMD 8x8x10mm to 10x10x14mm	
150 CLZ		Aluminum capacitors, SMD (chip); very low Z;	33 μ F - 1000 μ F;	SMD 8x8x10mm to 10x10x14mm	
153CLV		Aluminum capacitors, SMD (chip); long life;	0.47 μ F - 1000 μ F;	SMD 4x4x5.3mm to 10x10x14mm	

MLCC Capacitor

Product Name	Status	Description	Features	Package	Q-Level
VJ COG (NP0)		NPO MLCC, low dissipation factor; ideal for timing, snubber and surge suppression	up to 3000V; 1pF - 0.056 μ F;	SMD 0402 - 2225	
VJ X7R		X7R MLCC; excellent for decoupling and filtering;	up to 1000 V; 100pF - 1.8 μ F;	SMD 0402 - 3640	
VJHV ArcGuard COG		NPO MLCC, twice voltage breakdown; voltage divider applications;	10 pF - 2700 pF; 1000V; 1500V;	SMD 0805 - 1210	
VJHV ArcGuard X7R		X7R MLCC, high voltage breakdown; very high reliability;	100 pF -0.27 μ F; 250V - 1000V;	SMD 1206 - 1812	

HID Headlight AFL : BALLAST, Reverse Polarity Protection

MOSFETs

Product Name	Status	Description	Features	Package	Q-Level
SUD50N03-06AP		P-Channel, Tj = 175 °C power MOSFET; high-side reverse polarity protection;	P-Channel; rDS(on) = 0.155Ohms;	SMD TO-252	
SUD50N03-11		Low Side Reverse Polarity protection;	P-Channel; 60V; rDS(on) = 0.340Ohms;	SMD TO-252	
SUD50N04-10P		Fully AEC Q-101 qualified; low thermal resistance, fast switching;	P-Channel; rDS(on) = 0.065Ohms;	SMD TO-252	
SUM110P04-05		P-Channel, Tj = 175 °C power MOSFET; high-side reverse polarity protection;	P-Channel; rDS(on) = 0.004Ohms;	SMD TO-263	

Thick Film Resistors

Product Name	Status	Description	Features	Package	Q-Level
CRCW0603LR		Sense Resistors, pulse resistant; good long-term stability;	R22 - R91; 5%; TCR = 200	SMD 0603	AEC Q200
CRCW1206LR		Sense Resistors, pulse resistant; good long-term stability;	R22 - R91; 5%; TCR = 200	SMD 0805	AEC Q200
CRCW1210LR		Sense Resistors, pulse resistant; good long-term stability;	R22 - R91; 5 %; TCR = 200	SMD 1206	AEC Q200

HID Headlight AFL : BALLAST, Switch Mode Power Supply ; Flyback

Alu Elcaps

Product Name	Status	Description	Features	Package	Q-Level
150CLZ		Aluminum capacitors, SMD (chip); very low Z;	33 μ F - 1000 μ F;	SMD 8x8x10mm to 10x10x14mm	
150CRZ		Aluminum capacitors, SMD (chip); Pb-free;	33 μ F - 1000 μ F;	SMD 8x8x10mm to 10x10x14mm	
150CRZ		Aluminum capacitors, SMD (chip); very low Z, Pb-free;	33 μ F - 1000 μ F;	SMD 8x8x10mm to 10x10x14mm	
153CLV		Aluminum capacitors, SMD (chip); long life, vertical;	0.47 μ F - 1000 μ F;	SMD 4x4x5.3mm to 10x10x14mm	
153CRV		Aluminum capacitors, SMD (chip); long life, vertical, Pb-free;	0.47 μ F - 1000 μ F;	SMD 4x4x5.3mm to 10x10x14mm	

Ceramic Capacitors

Product Name	Status	Description	Features	Package	Q-Level
VJOMD X7R		Surface-mount ceramic capacitor solution for board-flex sensitive applications;	100 pF - 1.8 μ F; 50VDC - 3000VDC;	SMD 1206 - 2225	
VJOMD-COG		Surface-mount ceramic capacitor solution for board-flex sensitive applications;	100 pF - 47 μ F; 50VDC - 3000VDC;	SMD 1206 - 2225	

current Sense Shunt Resistors

Product Name	Status	Description	Features	Package	Q-Level
CRCW1218LR		Sense resistors, pulse resistant; good long-term stability, Jumper;	R10 - R91; 5 %; TCR = 200	SMD 1218	AEC Q200
CRCW2010LR		Sense resistors, pulse resistant; good long-term stability, Jumper;	R10 - R91, 5 %, TCR = 200	SMD 2010	AEC Q200
CRCW2512LR		Sense resistors, pulse resistant; good long-term stability, Jumper;	R10 - R91, 5 %, TCR = 200	SMD 2512	AEC Q200
WSLT2512		Power Metal Strip, 275 °C rated; TCR<= 20ppm/°C, current feedback sense;	R01 - R50; 0.5 - 1%; P = 1 W; precision;	SMD 2512	AEC Q200

MOSFETs

Product Name	Status	Description	Features	Package	Q-Level
SUM110N10-25L		N-Channel MOSFET, logic-level; low side switch, flyback;	N-Channel; 100V; rDS(on) = 0.025Ohms;	SMD TO-263	
SUM85N15-19		N-Channel MOSFET , logic-level; low side switch, boost;	N-Channel; 100V rDS(on) = 0.250Ohms;	SMD TO-263	
SUM90N10-19L		N-Channel MOSFET, logic-level; low side switch, flyback;	N-Channel; 100V rDS(on) = 0.019Ohms;	SMD TO-263	

Schottky diodes

Product Name	Status	Description	Features	Package	Q-Level
SS3P4L		Low VF, high current density;	VF = 0.335 V	SMD TO-277A(SMPC)	
SS3P6L		Low VF, high current density;	VF = 0.478 V	SMD TO-277A(SMPC)	
VJHiRelX5R		MLCCs for high-reliability applications;	100 pF - 6.8 μ F; 6.3VDC - 500VDC;	SMD 0402 - 3640	
VJHiRelX7R		MLCCs for high-reliability applications;	100 pF - 6.8 μ F; 6.3VDC - 500VDC;	SMD 0402 - 3640	

HID Headlight AFL : Bi-XENON SHUTTER, Transient Protection

Ceramic Capacitors

Product Name	Status	Description	Features	Package	Q-Level
VJHiRelX5R		MLCCs for high-reliability applications;	100 pF - 6.8 μ F; 6.3VDC - 500VDC;	SMD 0402 - 3640	
VJHiRelX7R		MLCCs for high-reliability applications;	100 pF - 6.8 μ F; 6.3VDC - 500VDC;	SMD 0402 - 3640	

Shunt Resistors

Product Name	Status	Description	Features	Package	Q-Level
WSL3921		Power Metal Strip shunts, very low TCR; low thermal EMF;	R0002 - R04; 1 %; TCR \leq 75ppm;	SMD 3921	AEC Q200
WSR-3		Power Metal Strip shunts, very low TCR; low thermal EMF;	3W; R001 - R2; 1 %; TCR \leq 75ppm;	SMD 4628	AEC Q200

TVS

Product Name	Status	Description	Features	Package	Q-Level
P4KA39A		400 W, unidirectional TVS, Tj = 185 °C;	Vbreak = 6.8V - 43V; IFSM = 40A	TH / Axial DO-41	AEC Q101
TPSMPxxA-HE3		400 W, unidirectional TVS, Tj = 185 °C;	Vbreak = 6.8 V - 43 V; IFSM = 40 A;	TH / Axial DO-204AL	AEC Q101

HID Headlight AFL : IGNITION, Avalanche Rectifier

Ultrafast Avalanche Rectifier

Product Name	Status	Description	Features	Package	Q-Level
BYG20D - J		Glass passivated junction; low reverse current 1 μ A; 20 mJ;	200 V - 600 V, IF = 1.5A; IFSM = 30A	SMD DO214AC (SMA)	AEC Q101

HID Headlight AFL : IGNITION, Boost Capacitor

Alu Elcaps

Product Name	Status	Description	Features	Package	Q-Level
152 CLT		SMD, high-voltage, low-ESR; high ripple current; long lifetime, 150°C	1µF - 2.2µF; 400 VDC	SMD 10x10x14mm	

Film Capacitor

Product Name	Status	Description	Features	Package	Q-Level
MKT1820		High transient, robust, >20 V/µsec; long lifetime, low profile;	400VDC; 0.68 µF;	SMD 1820	

HID Headlight AFL : IGNITION, Booster Rectification

High-Power Ultrafast

Product Name	Status	Description	Features	Package	Q-Level
BYG20D - J		Glass passivated junction; low reverse current 1 μ A, 20 mJ;	200 V - 600 V, IF = 1.5A; IFSM = 30A	SMD DO214AC (SMA)	AEC Q101

HID Headlight AFL : IGNITION, Buffering

Tantalum Capacitor

Product Name	Status	Description	Features	Package	Q-Level
TH3		150 °C rated, low ESR; 100% surge current tested;	10VDC - 50VDC; 0.33 μ F - 100 μ F;	SMD B / C / D / E	AEC Q200

HID Headlight AFL : IGNITION, Charge Resistors

Thick Film Resistor

Product Name	Status	Description	Features	Package	Q-Level
D25/CRCW1206IF		Very high pulse power;	1R - 10M Ω ; 1%; TCR = 100	SMD 1206	AEC Q200

HID Headlight AFL : IGNITION, Discharge Resistors

Thick Film Resistor

Product Name	Status	Description	Features	Package	Q-Level
D25/CRCW1206IF		Very high pulse power;	1R - 10M Ω ; 1%; TCR = 100	SMD 1206	AEC Q200

HID Headlight AFL : IGNITION, Filtering

MLCC Capacitor

Product Name	Status	Description	Features	Package	Q-Level
VJOMD X7R		Polymer termination, no crack, AEC-Q200;	100 pF - 1.8 μ F; 50VDC - 3000VDC;	SMD 1206 - 2225	

HID Headlight AFL : IGNITION, Overvoltage Protection

TVS

Product Name	Status	Description	Features	Package	Q-Level
SM8SxxA		High surge capability, low profile; AEC-Q101 qualified	6.6 kW; IFSM = 700A; Tj = 175 °C	SMD DO-218 AB	AEC Q101

HID Headlight AFL : IGNITION, Timing

Tantalum Capacitor

Product Name	Status	Description	Features	Package	Q-Level
293D		Low profile, low leakage current; automotive specified;	0.1 μ F - 680 μ F; 4VDC - 50VDC	SMD D-Case	

HID Headlight AFL : IR CAMERA FLASHING, Camera Flashing IR

High Radiant Intensity IR Emitter

Product Name	Status	Description	Features	Package	Q-Level
VSMYxxxx	SOON	Surface emitting diodes, high-power; high-speed, low thermal resistance;	>15 mW/sr; 950nm;830nm;850nm;870nm	SMD	

HID Headlight AFL : IR CAMERA FLASHING, ESD Protection

ESD Diodes

Product Name	Status	Description	Features	Package	Q-Level
SE10PB..PJ	NEW	ESD protection rectifier; low reverse current, 175 °C; AEC-Q101 qualified	100V - 600V; If = 1A; SMP	SMD DO-220AA (SMP)	AEC Q101

HID Headlight AFL : IR CAMERA FLASHING, Fast Switching

MOSFETs

Product Name	Status	Description	Features	Package	Q-Level
Si7922DN		Dual MOSFET, 100 V; very fast switching performance;	N-Channel; 100V; Dual; 2.5A; rDS(on) = 0.195Ohms	SMD PowerPAK 1212-8	
SQ7414EN	NEW	Low gate charge, low thermal resistance; high-current, LS-/HS-siwth, N-/P-Ch; AEC-Q101 qualified	N-Channel; 60V; rDS(on) = 0.025Ohms;	SMD PowerPAK1212-8	AEC Q101

HID Headlight AFL : IR CAMERA FLASHING, Transient Protection

TVS

Product Name	Status	Description	Features	Package	Q-Level
SM8SxxA		High surge capability, low profile; AEC Q101	6.6 kW; IFSM = 700A; Tj = 175 °C	SMD DO-218 AB	AEC Q101

HID Headlight AFL : LED DAYLIGHTING, Signal Lighting LED Driver

LED CLCC

Product Name	Status	Description	Features	Package	Q-Level
SMZGnnB		Power voltage-regulating diode; glass passivated chip, low impedance;	Vz = 9.1V - 68V; IR = 5 μ A; PD = 1.5W	SMD DO-215AA (SMBG)	AEC Q101

LED TELUX

Product Name	Status	Description	Features	Package	Q-Level
CRCW0402		Bulk resistors, pulse resistant; good long-term stability;	1R - 10M Ω ; 1%; TCR = 100	SMD 0402	AEC Q200
CRWC0603		Bulk resistors, pulse resistant; good long-term stability;	1R - 10M Ω ; 1%; TCR = 100	SMD 0603	
CRWC0805		Bulk resistors, pulse resistant; good long-term stability;	1R - 10M Ω ; 1%; TCR = 100	SMD 0603	

MOSFETs

Product Name	Status	Description	Features	Package	Q-Level
Si2318CDS		N-Channel 40V (D-S) MOSFET	rDS(on) = 0.042Ohms ID= 5.6A	SMD TO-236(SOT-23)	
SQ2309ES	NEW	P-Channel; MOSFET for general applications; Automotive AEC-Q101 Qualified	N-Channel; 60V; Id=-1.7A rDS(on) = .335 Ω @-10V Tj=-55 $^{\circ}$ C-+175 $^{\circ}$ C	SMD TO-236(SOT-23)	
SQ7415EN	NEW	Fully AEC Q-101 qualified; low thermal resistance, fast switching;	P-Channel; rDS(on) = 0.065Ohms;	SMD PowerPAK1212-8	AEC Q101

Shunt Resistors

Product Name	Status	Description	Features	Package	Q-Level
WSL0603		Power Metal Strip shunts, very low TCR; low thermal EMF;	R001 - R5; 1 %; TCR <= 75ppm;	SMD 0603	AEC Q200
WSL0805		Power Metal Strip shunts, very low TCR; low thermal EMF;	R001 - R5; 1 %; TCR <= 75ppm;	SMD 0805	AEC Q200

HID Headlight AFL : LED DAYLIGHTING, White LED Power Switch ; SMPS Buck / Boost ; Current Regulated

MOSFETs

Product Name	Status	Description	Features	Package	Q-Level
SQ7415EN	NEW	Fully AEC Q-101 qualified; low thermal resistance, fast switching;	P-Channel; rDS(on) = 0.065Ohms;	SMD PowerPAK1212-8	AEC Q101
SUD50P10-43L		P-Channel, high-voltage, low rDS(on); logic-level, boost switch;	P-Channel; 100V; rDS(on) = 0.043Ohms;	SMD TO-252	

Shunt Resistors

Product Name	Status	Description	Features	Package	Q-Level
CRCW2010LR		Sense resistors, pulse resistant; good long-term stability	R10 - R91; 5 %; TCR = 200	SMD 2010	AEC Q200
CRCW2512LR		Sense resistors, pulse resistant; good long-term stability	R10 - R91, 5 %, TCR = 200	SMD 2512	AEC Q200

Storage Inductor

Product Name	Status	Description	Features	Package	Q-Level
IHLP1616AB-01		Low-profile, high-current; high saturation current, shielded;	0.047 - 1uH; IDC=13A - 4A	SMD 1616	
IHLP2020		Low-profile, high-current; high saturation current, shielded;	0.1 - 2.2uH; IDC=30A - 5A	SMD 2020	
IHLP2525EZ-01		Low-profile, high-current; high saturation current, shielded;	0.1 - 10uH; IDC=60A - 7A	SMD 2525	
IHLP4040DZ-01		Low-profile, high-current; high saturation current, shielded;	0.56 - 10uH; IDC=12A-4.5A	SMD 4040	
IHLP5050EZ-11		Low-profile, high-current; high saturation current, shielded;	0.19 - 10uH; IDC=90A-12A	SMD 5050	
IHLP5050FD-01		Low-profile, high-current; high saturation current, shielded;	0.1uH - 10uH; IDC = 120A - 15.5A	SMD 5050	
IHLP6767		Low-profile, high-current; high saturation current, shielded;	0.1uH - 10uH; IDC = 120A - 15.5A	TH / Radial 6767	

Thick Film Resistors

Product Name	Status	Description	Features	Package	Q-Level
CRCW0402		Low-profile, high-power;	1R - 10MΩ; 1%; TCR = 100	SMD 0402	AEC Q200
CRCW0603		Low-profile, high-power;	1R - 10MΩ; 1%; TCR = 100	SMD 0603	AEC Q200
CRCW0805		Low-profile, high-power;	1R - 10MΩ; 1%; TCR = 100	SMD 0805	AEC Q200
CRCW1206		Low-profile, high-power;	1R - 10MΩ; 1%; TCR = 100	SMD 1206	AEC Q200
CRCW1210		Low-profile, high-power;	1R - 10MΩ; 1%; TCR = 100	SMD 1210	AEC Q200
CRCW2010		Low-profile, high-power;	1R - 10MΩ; 1%; TCR = 100	SMD 2010	AEC Q200
CRCW2512		Low-profile, high-power;	1R - 10MΩ; 1%; TCR = 100	SMD 2512	AEC Q200

HID Headlight AFL : LED SIGNAL LIGHTING, LED

Signal Lighting

Product Name	Status	Description	Features	Package	Q-Level
TLWO/Y7900		AllnGaP up to 110°C; low thermal resistance; 2 kV ESD protected	> 2000mlm / 70mA	TH / Radial TELUX	
VLMK/Y61xx		AllnGaP ; ESD up to 2 kV; low Profile; 60°;	35 lm/W;	SMD CLCC-6	

