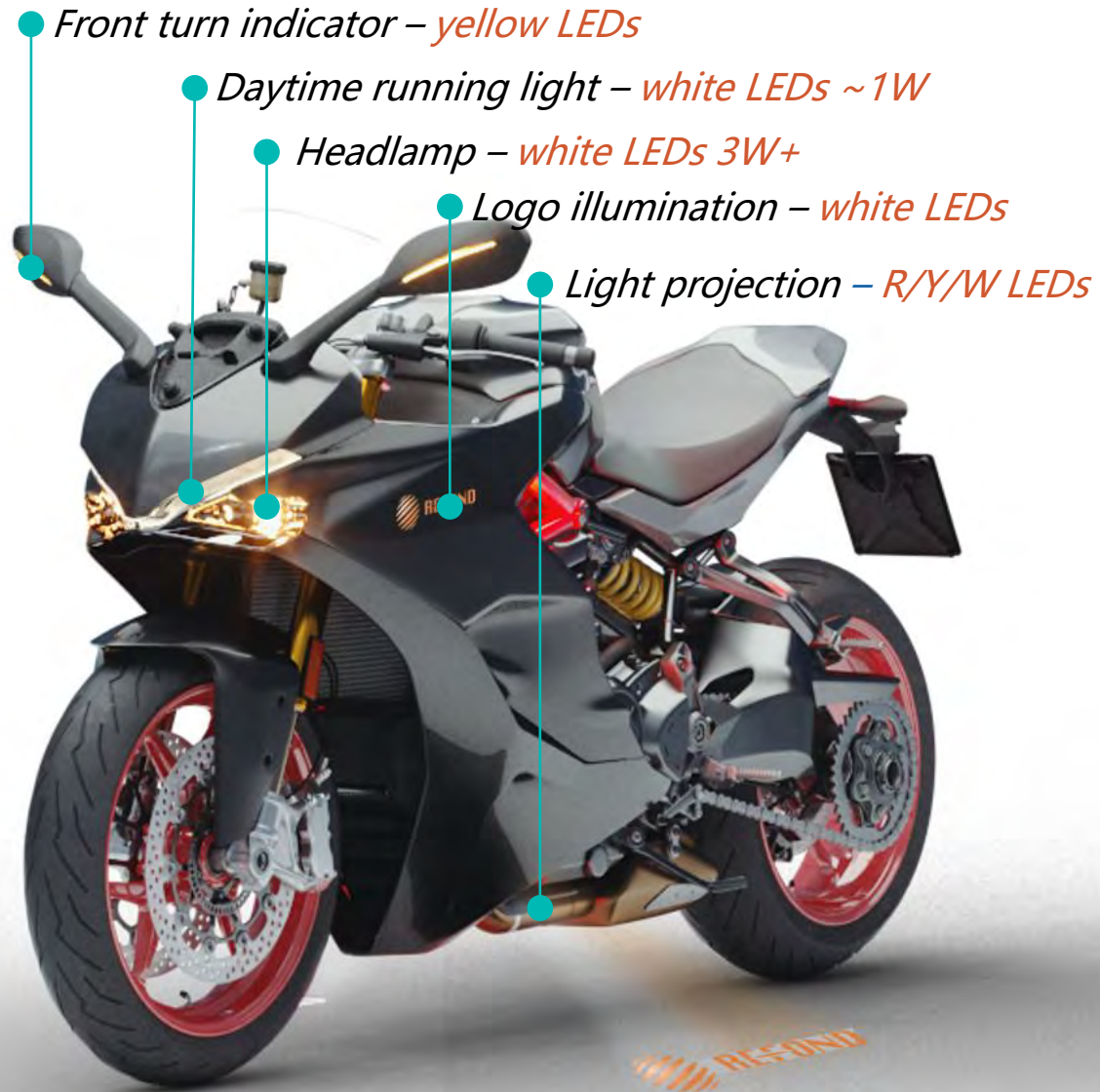


2-wheeler – motorbike



2-wheeler – e-bike

- Logo illumination - *White LEDs ~1W*
- Headlamp – *White LEDs 3W+*
- Daytime running light – *White LEDs ~1W*
- Headlamp & DRL – *White LEDs*
- Turning indicator – *Yellow LEDs*



- Cluster - *ChipLEDs*
- Turning indicator – *Yellow LEDs*
- Taillight – *Yellow LEDs*
- License plate illumination – *White LEDs*

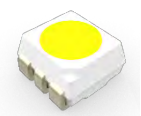


Refond 2-wheeler LEDs – automotive grade

Headlights		Signal lights						Interior lights				RGB	Backlight
 6930	 ADB module	 CW	 CW	 CW	 CW	 CW		 CW	 CW	 CW	 CW	 3535 RGB+IC	 3030
 5630	 2016	 PC	 PC	 PC	 PC	 PC		 PC	 PC	 PC	 PC	 3528 RGB	 4014
 4330	 3537	 R	 R	 R	 R	 angle 30°		 R	 R	 R	 R	 20mA	
 3030	 3030	 Y	 Y	 Y	 Y	 angle 60°		 Y	 Y	 Y	 Y	 3030 RGB	 3014
 2016								 O		 O		 60mA& 150mA	
Ceramic N in 1	ADB & Bi-color	2720 0.5~2W	3030 0.5-2W	3014 0.3-0.4	3535 0.5W	3528 PLCC4 0.2W	3528 lens 0.2W	2835 0.5W	3528 PLCC2 0.06W	2214 0.06W	1608 0.06W	3030/ 3535/ 3528	3014/ 4014/ 3030

Refond 2-wheeler LEDs – automotive grade white 0.2-0.7W



Power level	0.2W				0.5W			0.7W
Product images								
PN	RF-A4A31-W578-A2	RF-A3E31-W608-A2	RF-A3F30-W578-A2	RF-A3F30-W57J-A8	RF-A3T35-W5SE-A9	RF-A3E27-W60E-A8	RF-A3E31-W66E-A8B	RF-A3E27-W60I-B1
Benchmark	OSRAM LW E67C	/	SEOUL STW0E1KZ	SEOUL STW0E1LZ	OSRAM LW G6SP	OSRAM KW DMLN31.SG	Nichia NFSW172CT	/
Pin to pin replace	Yes	/	Yes	Yes	Yes	Yes	No	Yes
MP time	2022.12	2023.05	2022.5	2023.3	2020.4	2022.11	2024.03	2023.9
# of chips	1	1	1	1	1	1	1	1
Application	DRL/Logo/RL	DRL/Logo/RL	DRL/Logo/RL	DRL/Logo/RL	DRL/Logo/RL	DRL/Logo/RL	DRL/Logo/RL	DRL/RL
Typ spec. I_F (mA)	50	50	50	150	150	150	150	250
Typ spec. V_F (V)	3.0	3.0	3.0	3.00	3.15	3.15	3.15	3.10
T _j @25°C Flux (lm/mcd)	6300	23	23	55	30	58	60	80
Viewing angle (°)	120	120	120	120	120	120	120	120
PKG size (mm)	3.5x2.8x1.85	3.0x3.0x0.55	3.0x1.4x0.52	3.0x1.4x0.52	3.5x3.5x1.90	2.7x2.0x0.60	3.0x3.0x0.55	2.7x2.0x0.60
I _{F MAX} (mA)	70	70	120	200	180	200	240	300
CCT (K)	6000K	6000K	6000K	6000K	6000K	6000K	6000K	6000K
T _{J MAX} (°C)	125	125	125	150	125	150	150	150
Typ R _{th js_el} (°C/W)	80	42	45	20	50	19	18.2	14.0
ESD (KV)	2	8	8	8	8	8	8	8
AEC-Q102	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
USCAR33	No	No	No	No	No	No	Yes	No
Rayfile	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP
Chip in the center?	No	No	Yes	Yes	No	Yes	No	Yes
MOQ (pcs)	4000	4000	5000	5000	4000	4000	4000	4000
Main flux bin	P2/Q1	KA/KB/LA	KA/KB/LA	OA/OB	PB/QA	PB/QA	PB/QA	QB/RA
In 2024	5300-6500-8000	19.6-21.8-24.2-26.9	19.6-21.8-24.2-26.9	45.3-50-55.3	61.2-67.8-75.3	61.2-67.8-75.3	61.2-67.8-75.3	75.3-83.7-93.2
MP cases	BYD Qin PLUS NIO	General parts	Chery EHY	DFM SX3	Chery EV JAC Shuailing Q6	SAIC AS33	Geely Xinyue Lynk	FAW Jiefang Truck J6L

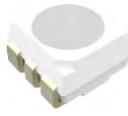


Refond 2-wheeler LEDs – automotive grade white 1~15W

Power level	1.0W		3.0W		6.0W	9.0W	12.0W	15.0W
Product images								
PN	RF-A3E27-W60H-B2	RF-A3E31-W66H-B6	RF-A3H10-W63P-E4	BRF-A3H10-W57P-E4	RF-A3H22-W60P-E6	RF-A3H30-W60P-E6	RF-A4H40-W60P-E6	RF-A4H50-W60P-E6
Benchmark	OSRAM KW DMLQ33.SG	Nichia NJSW172C	OSRAM KW CELNM1.TG	OSRAM KW CELNM1.TG	OSRAM KW2 CFLNM1.TG	OSRAM KW3 CGLNM2.TK	OSRAM KW4 CHLNM2.TK	/
Pin to pin replace	Yes	No	No	No	No	No	No	No
MP time	2023.5	2022.01	2022.7	2022.6	2022.6	2022.6	2022.6	2022.6
# of chips	1	1	1	1	2	3	4	5
Application	DRL/RL	DRL/RL	Headlamp	Headlamp	Headlamp	Headlamp	Headlamp	Headlamp
Typ spec. I_F (mA)	350	350	1000	1000	1000	1000	1000	1000
Typ spec. V_F (V)	3.00	3.00	3.10	3.10	6.4	9.8	13	16.5
Tj@25°C Flux (lm/mcd)	130	130	400	440	850	1250	1600	1470
Viewing angle (°)	120	120	120	120	120	120	120	120
PKG size (mm)	2.7x2.0x0.60	3.0x3.0x0.55	2.0x1.6x0.80	2.0x1.6x0.80	3.0x3.0x0.80	4.3x3.0x0.80	5.6x3.0x0.80	6.9x3.0x0.80
$I_{F\ MAX}$ (mA)	420	450	1500	1500	1500	1500	1500	1500
CCT (K)	6000K	6000K	6000K	6000K	6000K	6000K	6000K	6000K
$T_{J\ MAX}$ (°C)	150	150	150	150	150	150	150	150
Typ $R_{th\ js_el}$ (°C/W)	19.3	19.3	1.8	1.4	1.6	1.1	0.83	0.7
ESD (KV)	8	8	8	8	8	8	8	8
AEC-Q102	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
USCAR33	No	Yes	No	No	No	No	No	No
Rayfile	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP
Chip in the center?	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
MOQ (pcs)	4000	4000	4000	4000	4000	4000	4000	4000
Main flux bin	SB/TA	SB/TA	BH/FD	FD/FE/FF	CD/DB	DF/DG	EB/EC	EE/EF
In 2024	117-130-144	117-130-144	380-400-430	400-430-460-500	730-800-900	1200-1300-1400	1450-1600-1750	1900-2050-2200
MP cases	DFM Nissan Qichen 534	Volvo EM90 Geely Boyue L	Wuling Baojun/HG mini	Wuling/ JAC Geely Panda	Wuling Jiali/Anrui/Binzhi	Wuling Jiali/Anrui/Binzhi	NA	NA

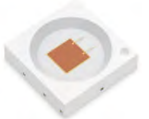
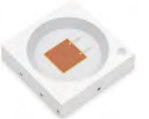
Refond 2-wheeler LEDs – automotive grade red 0.5W



Power level	0.5W					
Product images						
PN	RF-A4T35-R15E-R5	RF-A4T35-R20E-R5	RF-A4E27-R15E-R4	RF-A4E27-R22E-R4	RF-A4E31-R15E-R4	RF-A4E31-R20E-R4
Benchmark	OSRAM LA G6SP.01	OSRAM LA G6SP.01	OSRAM KR DMLN31.23	OSRAM KR DMLN31.23	OSRAM KR DMLN31.23	OSRAM KR DMLN31.23
Pin to pin replace	Yes	Yes	Yes	Yes	No	No
MP time	2022.9	2022.9	2023.7	2023.7	2022.05	2022.05
# of chips	1	1	1	1	1	1
Application	Rear combination lamps	Rear combination lamps	Rear combination lamps	Rear combination lamps	Rear combination lamps	Rear combination lamps
Typ spec.	I _F (mA)	150	150	150	150	150
	V _F (V)	2.20	2.20	2.20	2.20	2.20
T _j @25°C	Flux (lm/mcd)	23	23	33	33	30
Viewing angle (°)	120	120	120	120	120	120
PKG size (mm)	3.5x3.5x1.90	3.5x3.5x1.90	2.7x2.0x0.60	2.7x2.0x0.60	3.0x3.0x0.55	3.0x3.0x0.55
I _F MAX (mA)	180	180	180	180	180	180
Color	615nm	620nm	615nm	620nm	615nm	620nm
T _J MAX (°C)	125	125	150	150	150	150
Typ R _{th} js_el (°C/W)	23	23	23	23	23	23
ESD (KV)	2	2	2	2	2	2
AEC-Q102	Yes	Yes	Yes	Yes	Yes	Yes
USCAR33	No	No	No	No	No	No
Rayfile	SPEOS、 LUCID、 ASAP	SPEOS、 LUCID、 ASAP	SPEOS、 LUCID、 ASAP	SPEOS、 LUCID、 ASAP	SPEOS、 LUCID、 ASAP	SPEOS、 LUCID、 ASAP
Chip in the center?	No	No	Yes	Yes	No	No
MOQ (pcs)	4000	4000	4000	4000	4000	4000
Main flux bin	MA/MB	LB/MA	MA/MB	LB/MA	MA/MB	LB/MA
In 2024	30.0-33.4-37.0	26.9-30.0-33.4	30.0-33.4-37.0	26.9-30.0-33.4	30.0-33.4-37.0	26.9-30.0-33.4
MP cases	Sanli H53 SAIC EH32	SAIC AP32	DFM Jingyi x5	DFM Jingyi x5	Sany truck	Sany truck

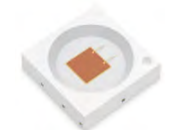
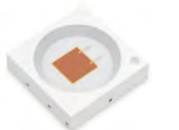
Refond 2-wheeler LEDs – automotive grade red 0.2W & 1W



Power level	0.2W			1W			
Product images							
PN	RF-A4A31-R158-R1	RF-A4A31-R208-R1	RF-A4E31-R158-R1	RF-A4E27-R15H-S1	RF-A4E27-R22H-S1	RF-A4E31-R15H-S1	RF-A4E31-R22H-S1
Benchmark	OSRAM LA E67F	OSRAM LA E67F	/	OSRAM KR DMLQ31.23	OSRAM KR DMLQ31.23	OSRAM KR DMLQ31.23	OSRAM KR DMLQ31.23
Pin to pin replace	Yes	Yes	Yes	Yes	Yes	No	No
MP time	2022.5	2020.8	2023.04	2023.9	2023.9	2023.11	2023.11
# of chips	1	1	1	1	1	1	1
Application	Rear combination lamps	Rear combination lamps	Rear combination lamps	Rear combination lamps	Rear combination lamps	Rear combination lamps	Rear combination lamps
I _F (mA)	50	50	50	350	350	350	350
Typ spec. V _F (V)	2.20	2.20	2.20	2.40	2.20	2.20	2.20
T _j @25°C Flux (lm/mcd)	3400	2700	10	61	56	61	56
Viewing angle (°)	120	120	120	120	120	120	120
PKG size (mm)	3.5x2.8x1.85	3.5x2.8x1.85	3.0x3.0x0.55	2.7x2.0x0.60	2.7x2.0x0.60	2.7x2.0x0.60	2.7x2.0x0.60
I _F MAX (mA)	70	70	70	420	420	420	420
Color	615nm	620nm	615nm	615nm	620nm	615nm	620nm
T _J MAX (°C)	125	125	125	150	150	150	150
Typ R _{th js_el} (°C/W)	80	80	90	6	6	6	6
ESD (KV)	2	2	2	2	2	2	2
AEC-Q102	Yes	Yes	Yes	Yes	Yes	Yes	Yes
USCAR33	No	No	No	No	No	No	No
Rayfile	SPEOS、 LUCID、 ASAP	SPEOS、 LUCID、 ASAP	SPEOS、 LUCID、 ASAP	SPEOS、 LUCID、 ASAP	SPEOS、 LUCID、 ASAP	SPEOS、 LUCID、 ASAP	SPEOS、 LUCID、 ASAP
Chip in the center?	No	No	No	Yes	Yes	No	No
MOQ (pcs)	2000	2000	4000	4000	4000	4000	4000
Main flux bin	O1/O2	N2/O1	GB/HA/HB	PB/QA	PA/PB	PB/QA	PA/PB
In 2024	2800-3500-4300	2300-2800-3500	9.5-10.5-11.7-13	61.2-67.8-75.3	55.3-61.2-67.8	61.2-67.8-75.3	55.3-61.2-67.8
MP cases	Chery Zhimi V23/S56	Varroc SVW	Xingyu D01	Chery V23	SAIC AP32	Hozon EP32	DFM D600

Refond 2-wheeler LEDs – automotive grade super red



Power level	0.2W		0.5W		1W
Product images					
PN	RF-A4A31-R308-R1	RF-A4E27-R30E-R4	RF-A4E31-R30E-R4	RF-A4E27-R30H-S1	RF-A4E31-R30H-S1
Benchmark	OSRAM LS E67F	OSRAM KS DMLN31.23	OSRAM KS DMLN31.23	OSRAM KS DMLQ31.23	OSRAM KS DMLQ31.23
Pin to pin replace	Yes	Yes	No	Yes	No
MP time	2022.4	2022.7	2022.07	2023.7	2022.6
# of chips	1	1	1	1	1
Application	Rear combination lamps	Rear combination lamps	Rear combination lamps	Rear combination lamps	Rear combination lamps
I_F (mA)	50	150	150	350	350
Typ spec. V_F (V)	2.20	2.20	2.20	2.40	2.40
Tj@25°C Flux (lm/mcd)	2000	19	19	47	48
Viewing angle (°)	120	120	120	120	120
PKG size (mm)	3.5x2.8x1.85	2.7x2.0x60	3.0x3.0x0.55	2.7x2.0x0.60	3.0x3.0x0.55
$I_{F\ MAX}$ (mA)	70	180	180	420	420
Color	630nm	630nm	630nm	630nm	630nm
$T_{J\ MAX}$ (°C)	125	150	150	150	150
Typ $R_{th_js_el}$ (°C/W)	80	23	33	6	6
ESD (KV)	2	2	2	2	2
AEC-Q102	Yes	Yes	Yes	Yes	Yes
USCAR33	No	No	No	No	No
Rayfile	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP
Chip in the center?	No	Yes	No	Yes	No
MOQ (pcs)	2000	4000	4000	4000	4000
Main flux bin	M2/N1	JB/KA	JB/KA	NB/OA/OB	NB/OA/OB
In 2024	1500-1800-2300	17.7-19.6-21.8	17.7-19.6-21.8	40.9-45.3-50-55.3	40.9-45.3-50-55.3
MP cases	Chery Zhimi V23	NIO DOM(L60)	SAIC AP31	Chery Zhimi V23	Nissan P20

Refond 2-wheeler LEDs – automotive grade yellow 0.5W



Power level	0.5W				
Product images					
PN	RF-A3F30-WYSJ-A8	RF-A4T35-Y93E-Y6	RF-A3T35-WYSE-A9	RF-A3E27-WYSE-B2	RF-A3E31-WYSE-A8
Benchmark	SEOUL STAPE1LZ	OSRAM LY G6SP	OSRAM LCY G6SP	OSRAM KY-DMLN31.FY	Nichia NFSA172CT
Pin to pin replace	Yes	Yes	Yes	Yes	No
MP time	2023.4	2022.3	2020.8	2022.3	2023.01
# of chips	1	1	1	1	1
Application	TL	TL	TL	TL	TL
I_F (mA)	140	150	150	150	150
Typ spec. V_F (V)	3.00	2.30	3.15	3.10	3.10
Tj@25°C Flux (lm/mcd)	35	23	43	43	45
Viewing angle (°)	120	120	120	120	120
PKG size (mm)	3.0x1.4x0.52	3.5x3.5x1.90	3.5x3.5x1.90	2.7x2.0x0.60	3.0x3.0x0.55
$I_{F\ MAX}$ (mA)	200	180	180	180	240
Color	amber	Yellow	amber	amber	amber
$T_{J\ MAX}$ (°C)	150	125	125	150	150
Typ $R_{th_js_el}$ (°C/W)	28	36	30	21	25
ESD (KV)	8	2	8	8	8
AEC-Q102	Yes	Yes	Yes	Yes	Yes
USCAR33	No	No	No	No	No
Rayfile	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP	SPEOS、LUCID、ASAP
Chip in the center?	Yes	No	No	Yes	No
MOQ (pcs)	5000	4000	4000	4000	4000
Main flux bin	MA/MB/NA	KA/KB/LA	NB/NA	NB/OA	NB/OA
In 2024	30-33.4-37-40.9	19.6-21.8-24.2-26.9	40.9-45.3-50	40.9-45.3-50	40.9-45.3-50
MP cases	DFM SX3	DFM Xiaokang	JAC Shuailing Q6	SAIC AS33	Geely (FS11)

Refond 2-wheeler LEDs – automotive grade yellow 0.2W/ 1W/ 3W



Power level	0.2W			1W		3W
Product images						
PN	RF-A4A31-WYS8-A4	RF-A4A31-Y918-Y1	RF-A3F30-WYS8-A2	RF-A3E27-WYSG-B6	RF-A3E31-WYSH-B6	RF-A3H10-WYSP-E6
Benchmark	OSRAM LY E67F	OSRAM LY E67F	/	OSRAM KY DMLQ31.FY	Nichia NJSA172CT	OSRAM KY CELNM1.FY
Pin to pin replace	Yes	Yes	Yes	Yes	No	No
MP time	2022.3	2022.4	2023.4	2022.3	2022.03	2022.5
# of chips	1	1	1	1	1	1
Application	TL	TL	TL	TL	TL	TL
I _F (mA)	50	50	50	300	350	1000
Typ spec. V _F (V)	3	2.20	3.00	3.10	3.10	3.10
T _j @25°C Flux (lm/mcd)	5300	3400	16	85	95	260
Viewing angle (°)	120	120	120	120	120	120
PKG size (mm)	3.5x2.8x1.85	3.5x2.8x1.85	3.0x1.4x0.52	2.7x2.0x0.60	3.0x3.0x0.55	2.0x1.6x0.80
I _{F MAX} (mA)	70	70	70	360	450	1500
Color	amber	Yellow	amber	amber	amber	amber
T _{J MAX} (°C)	120	120	125	150	150	150
Typ R _{th js_el} (°C/W)	80	80	45	13	24	4.1
ESD (KV)	2	2	8	8	8	8
AEC-Q102	Yes	Yes	Yes	Yes	Yes	Yes
USCAR33	Yes	No	No	Yes	Yes	No
Rayfile	SPEOS、 LUCID、 ASAP	SPEOS、 LUCID、 ASAP	SPEOS、 LUCID、 ASAP	SPEOS、 LUCID、 ASAP	SPEOS、 LUCID、 ASAP	SPEOS、 LUCID、 ASAP
Chip in the center?	No	No	Yes	Yes	No	Yes
MOQ (pcs)	2000	2000	5000	4000	4000	4000
Main flux bin	O2/P1/P2	W1/O1/O2	JB/KA/KB	QB/RA/RB	RA/RB/SA	BA/BB
In 2024	3500-4300-5300-6500	2500-2800-3500-4300	13-14.4-16-17.7	75.3-83.7-93.2-105	83.7-93.2-105-117	240-260-280
MP cases	Standard parts	Caterpillar	Chery EHY	DFM Nissan Qichen 534	Chery BoyueL	Wuling Baojun/ mini

Refond 2-wheeler LEDs – ChipLEDs for cluster



P/N	Current/mA	Size/mm	Color bin	Voltage bin	Intensity bin
RF-BWB190DS-CK-E1	20	1.6*0.8*0.68	WT1 WT2 WT3 WT4	2.7-3.3V (0.1v)	800-1000-1200-1500-1800
RF-BWB190DS-CK-E2	20	1.6*0.8*0.68	WF1 WF2 WF3 WF4	2.6-3.4v(0.1V)	800-1000-1200-1500-1800
RF-BWB190DS-CK-E5	20	1.6*0.8*0.68	WT2 WF3 WF4 WT5 WT6	2.7-3.3V	1000-1600
RF-WU1808DS-DD-E2	20	1.8*0.8*0.5	DC01 DC02 DC03 DC04 DC05	2.7-3.1V	1800-2500

