

INNOVATE FOR LIGHT



Automotive Product Roadmap

Automotive Product Segment



Intelligent Car-Light



✓ Switching
MBI6665Q
MBI6659Q
MBI6657Q
MBI6671Q

✓ Linear
MBI1841Q

Intelligent Display



✓ LED Display IC
MBI5353Q

✓ LCD Backlight IC
MBI5353Q
MBI6353Q

Product Roadmap



Switching

MBI6657Q
40V/1.2A
MP
AEC-Q100

*Buck with Fix
Frequency + Jitter*

MBI6659Q
45V/2.5A
MP
AEC-Q100

MBI6671Q
65V/ext MOS
MP
AEC-Q100

*Multi-topology with Fix
Frequency + Jitter*

MBI6665Q
65V/2.0A
MP
AEC-Q100

PMOS

MBI5989Q
7V/3.5A
180mΩ/16ch
Plan On_Going

Linear

MBI1841Q
Turning Indicator
MP
AEC-Q100

MBI5353Q
17V/20mA
48ch x 32scan
MP
AEC-Q100

MBI6353Q
17V/70mA
48ch x 4scan
ES
On_Going

Automotive lighting

LED Display
LCD Backlight

Comparison Table - Switch



Model	MBI6671Q	MBI6665Q	MBI6657Q	MBI6659Q
Input Voltage Rating	5.4~65V	6~65V	6~40V	5~45V
Current Rating	External	2.0A	1.2A	2.5A
On Resistance of SW(TYP)	-	0.27Ω	0.3Ω	0.25Ω
Topology	Buck / Buck-Boost / Boost/SEPIC	Buck / Buck-Boost / Boost	Buck	Buck
Dimming method	PWM	PWM	PWM Hysteretic PFM	PWM
	Analog	Analog	Analog	Analog
EMI	NA	Jitter	NA	Jitter
Package	TSSOP-14L	TSSOP-20L	SOP-8L	SOP-8L
Fault Flag	UVLO/OVP/Thermal Shutdown/LED Open Error Flag/LED Short Error Flag	UVLO/ Soft-start/ OVP/ Thermal Shutdown/ Thermal Fold-back/ LED Open-Circuit/ Short Circuit/ LDO Output protection / LED open/short circuit detection flag	Thermal Foldback Thermal Shutdown Schottky Diode short LED Open/Short	UVLO Thermal Foldback Over Current Protection Over Temperature Protection Diode Short Detection
AEC-Q100	Grade 1 (-40°C~125°C)	Grade 1 (-40°C~125°C)	Grade 1 (-40°C~125°C)	Grade 1 (-40°C~125°C)

Comparison Table - OE Backlight IC



Features	Macroblock	
	MBI5353Q	MBI6353Q
CH	48	48
Scans	32	4
Scan Control	Manual	Auto
PMOS	External	External
PLL	x	v
Vin (V)	3~5.5	5(4.5~5.5)
VLED Max. (V)	17	17
IOUT/CH (mA)	10mA(3.3V) 20mA(5V)	4~70mA(5V)
Current Accuracy	Between channels: $\pm 3.5\%$ (Max.) Between chips: $\pm 7.0\%$ (Max.)	Between channels: $\pm 3.0\%$ (Max.) Between chips: $\pm 5.0\%$ (Max.)
Current Setting	By external resistor	Global Current Gain: 8bit
Current Gain	Global: 3 bits(100%~200%)	Global: 8bit
Protocol	LE including DCLK with Daisy Chain	SPI with Daisy Chain
PWM(bit)	16	12(PWM/Hybrid)
ADIM(bit)	-	10
Protection	Open/Short Detection	Open/Short Detection
Regulation	ASIL A	ASIL B



MBI6665Q Features

- 6~65V wide input voltage range
- Integrated Low Side Switch with Peak Current Limit up to 2.0A
- 5V LDO output with supply output current capability limit of 37.5mA
- PWM/DC input for dimming control
- Minimum 5% Analog Dimming
- Minimum 5% PWM Dimming @ 1KHz (Boost/Buck)
- Minimum 10% PWM Dimming @ 1KHz (Buck-Boost)
- Full protections: UVLO/ Soft-start/ OVP/ Thermal Shutdown/ Thermal Fold-back/ LED Open-Circuit/ Short Circuit/ LDO Output protection
- LED open/short circuit detection flag
- AEC-Q100 Grade-1



MBI6671Q Features

- 5.4~65V wide input voltage range
- Provide high constant current by external power NMOS
- PWM/DC input for dimming control
- Full protections: UVLO/ OVP/ Thermal Shutdown/ LED Open Circuit/ Short Circuit Error Flag/ Cycle-by-cycle Current Limit
- AEC-Q100 Grade-1

MBI6659Q Features

- 5~45V wide input voltage range
- Open Loop Power Regulator output 5V for Gate Driver
- Support Analog/PWM Dimming (select by EN pin)
- Minimum 5% Analog Dimming
- Minimum 5% PWM Dimming @ 1KHz
- $\pm 3\%$ Output Current Accuracy
- Integrated Low Side Switch with 0.25Ω low $R_{ds(on)}$
- 3A Peak Current Limit
- Up to 1MHz Switching Frequency (Adjustable through External Resistor ROSC)
- Fixed Spread Spectrum range for EMI Consideration
- DC-DC Protection: UVLO/Soft-Start/Diode Short/Thermal Foldback(TFB)/Over Current Protection(OCP)/Over Temperature Protection(OTP)
- AEC-Q100 Grade-1



MBI6657Q Features

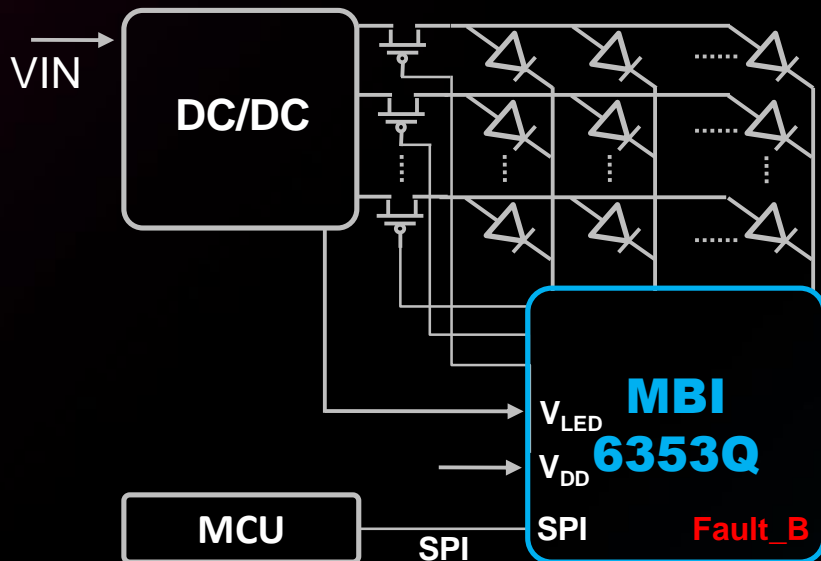
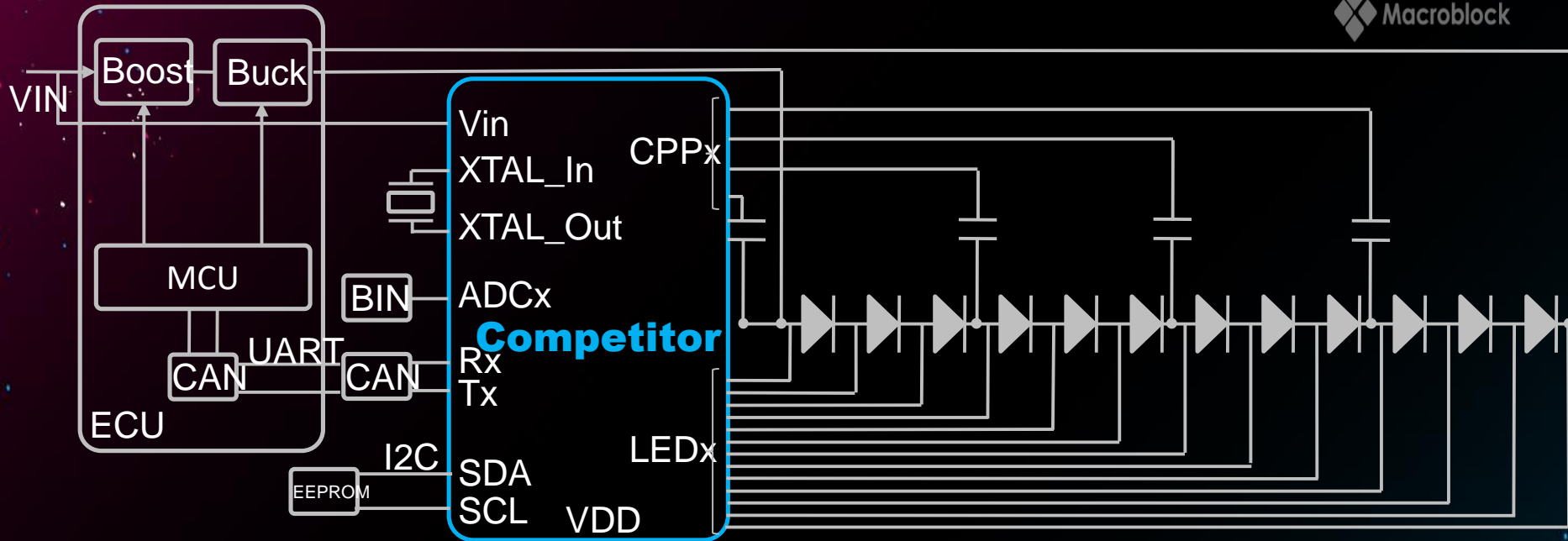
- 6~40V wide input voltage range
- Maximum 1.2A constant output current
- PWM/DC input for dimming control
- Hysteretic PFM operation eliminates external compensation design
- Integrated power switch with 0.30-ohm low $R_{ds(on)}$
- Full protections: Thermal Foldback/ Thermal Shutdown/ Schottky Diode Short/ LED Open/Short-Circuit
- Only 5 external components required
- Package MSL Level: 1
- AEC-Q100 Grade-1

MBI6353Q Features



- Support 1~4 multiplexing(scans)
- 48 constant-current output channels
- Constant output current range per channel:
 - 4~70mA @ 5.0V supply voltage
 - Sustain voltage 17V
- Flexible PWM control to improve visual refresh rate
 - Patented S-PWM technology to improve refresh rate 3840Hz
 - Programmable hybrid brightness control
 - Extra 2-bits high luminance mode by zone ($I_{OUT} * 100\% \sim I_{OUT} * 400\%$)
- 8-bit adjustable global DC current setting
- Support data gray-scale:
 - PWM: 12bits
 - PAM: 10bits
 - Hybrid: PWM-12bits/PAM-10bits
- Real-time LED Open/Short detection and protection
- Over temperature protection
- Fault_B(for ASIL B)
- AEC-Q100 Grade-1 (Certification on-going)

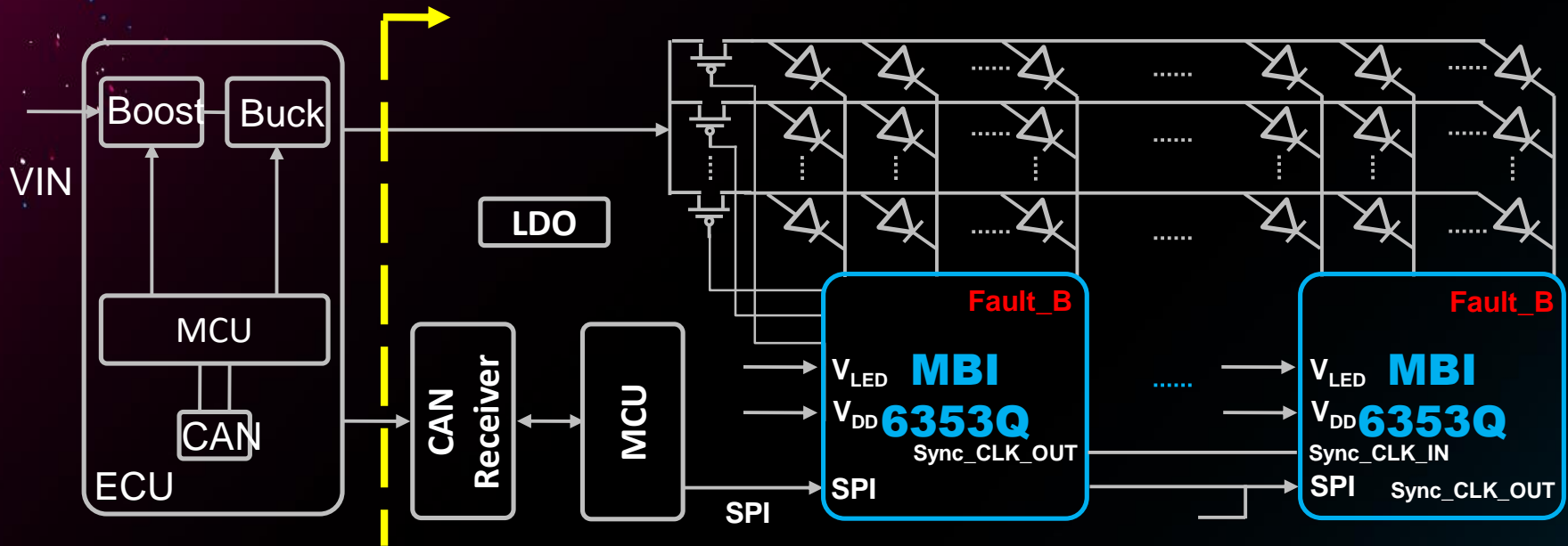
Matrix Headlamp - 1



MBI6353Q

- 48 channels
- 4 Scans
- VLED: 17V
- Iout: 70mA
- OTP & Open/Short detection
- Fault_B (for ASIL B)

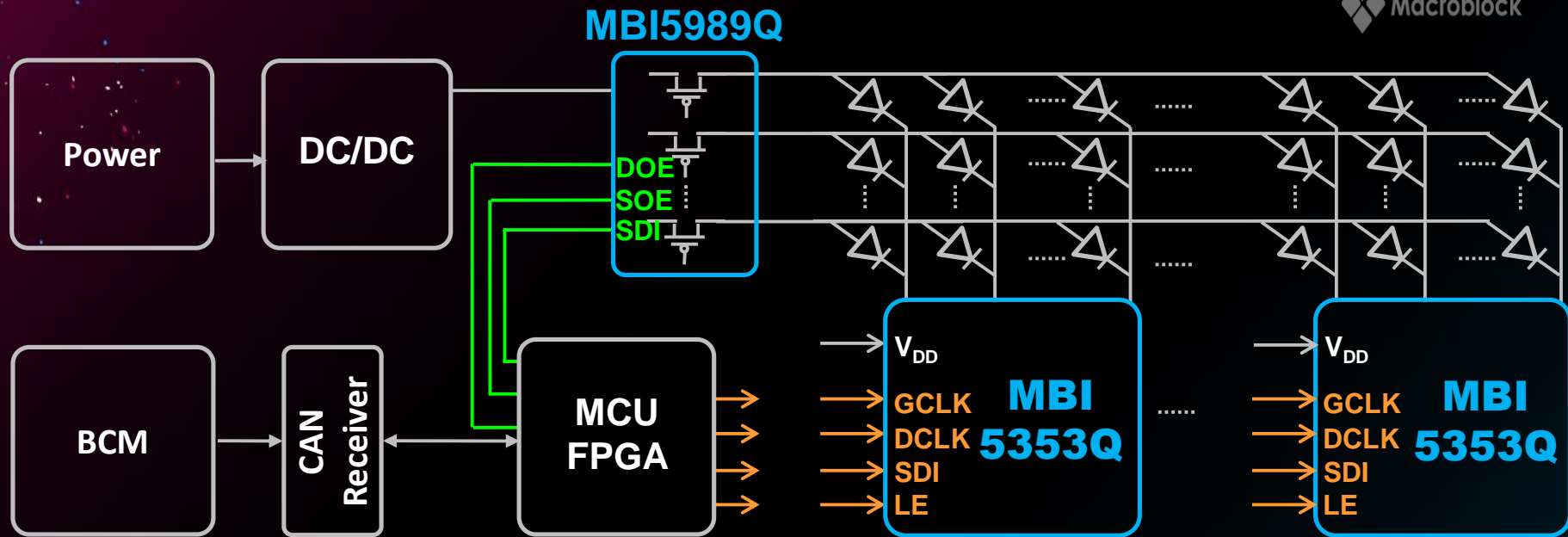
Matrix Headlamp - 2



MBI6353Q

- 48 channels
- 4 Scans
- V_{LED} : 17V
- I_{out} : 70mA
- OTP & Open/Short detection
- **Fault_B (for ASIL B)**

Matrix LED Lighting



MBI5989Q

- Switch MOS
- 16 channels
- VLED: 7V
- Iout: 3.5A
- OTP & OCP
- LED short detection

MBI5353Q

- Constant Current LED driver IC
- 48 channels
- 32 Scans
- VLED: 17V
- Iout: 20mA
- Compulsory Open/Short detection

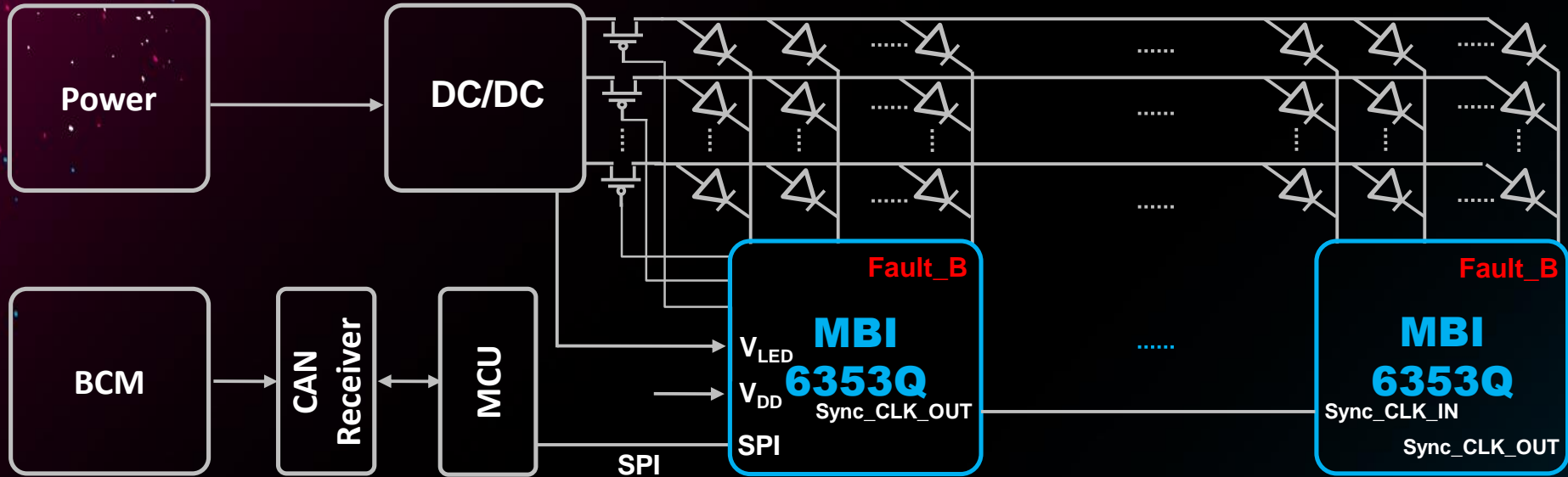


Thank You!

INNOVATE FOR LIGHT



Matrix Headlamp - 2



MBI6353Q

- 48 channels
- 4 Scans
- V_{LED}: 17V
- I_{out}: 70mA
- OTP & Open/Short detection
- **Fault_B(for ASIL B)**