

TN/STN LCD Driver series

LCD Segment Drivers

Low Duty LCD Segment Drivers																
Part No.	Display (dots)	Outputs		Operating Voltage (V)		Operating Temperature (°C)	Duty	Bias	I/F	EVR	GPO	Independent Blink	LED Driver (port)	PWM Gen.	Keyscan	Package
		seg.	com.	I/F Power Supply (V _{DD})	LCD Power Supply (VLCD)											
BU9796AMUV	48	12	4	2.5 to 5.5		-40 to +85	1/4	1/3, 1/2	2wire	–	–	–	–	–	–	VQFN024V4040
BU9796AFS	80	20	4	2.5 to 5.5		-40 to +85	1/4	1/3, 1/2	2wire	–	–	–	–	–	–	SSOP-A32
BU97941FV	104	26	4	1.8 to 3.6	2.7 to 5.5	-40 to +85	1/4, 1/3, Static	1/3	3wire	–	–	–	4	–	–	SSOP-B40
BU9795AFV	108	27	4	2.5 to 5.5		-40 to +85	1/4	1/3, 1/2	3wire	–	–	–	–	–	–	SSOP-B40
BU97930MUV	108	27	4	1.8 to 3.6	2.7 to 5.5	-40 to +85	1/4, 1/3, Static	1/3	3wire	–	4port	✓	1	1ch 8bit	–	VQFN040V6060
BU97931FV	112	28	4	1.8 to 3.6	2.7 to 5.5	-40 to +85	1/4, 1/3, Static	1/3	3wire	–	5port	✓	1	1ch 8bit	–	SSOP-B40
BU97960MUV	120	15	8	2.5 to 6.0	2.5 to 6.0	-40 to +85	1/8, 1/4	1/4, 1/3	2wire	✓	–	–	–	–	–	VQFN028V5050
BU9795BKV	140	35	4	2.5 to 5.5		-40 to +85	1/4	1/3, 1/2	3wire	–	–	–	–	–	–	VQFP48C
BU9795ZKS2	140	35	4	2.5 to 5.5		-40 to +85	1/4	1/3, 1/2	3wire	–	–	–	–	–	–	SQFP-T52
BU9797AFUV	144	36	4	2.5 to 5.5		-40 to +85	1/4	1/3	2wire	–	–	–	–	–	–	TSSOP-C48V
BU97981MUV	168	42	4	1.8 to 3.6	3.3 to 5.5	-30 to +75	1/4, 1/3, Static	1/3	3wire	–	27port	✓	3	2ch 12bit	–	VQFN56AV8080
BU97981KV	196	49	4	1.8 to 3.6	3.3 to 5.5	-30 to +75	1/4, 1/3, Static	1/3	3wire	–	31port	✓	3	2ch 12bit	–	VQFP64
BU97981GU	196	49	4	1.8 to 3.6	3.3 to 5.5	-30 to +75	1/4, 1/3, Static	1/3	3wire	–	31port	✓	3	2ch 12bit	–	VBGA064T050A
BU9794AKV	200	50	4	2.5 to 5.5	2.5 to 5.5	-40 to +85	1/4	1/3, 1/2	3wire	–	–	–	–	–	–	VQFP64
BU9799KV	200	50	4	2.5 to 5.5	2.5 to 5.5	-40 to +85	1/4	1/3, 1/2	2wire	✓	–	–	–	–	–	VQFP64
BU97501KV	204	51	4	2.7 to 6.0	4.5 to 6.0	-40 to +85	1/4, 1/3	1/3, 1/2	3wire+KEYOUT	–	4port	–	–	–	5x6 Max 30Key	VQFP64
BU97950AFUV	280	35	8	2.5 to 6.0	2.5 to 6.0	-40 to +85	1/8, 1/4	1/4, 1/3	2wire	✓	–	–	–	–	–	TSSOP-C48V
BU97530KVT	445	89	5	2.7 to 6.0		-40 to +85	1/5, 1/4, 1/3, Static	1/3, 1/2	3wire+KEYOUT	✓	9port (9ch PWM)	–	–	9ch 8bit	5x6 Max 30Key	TQFP100V

Low Duty LCD Segment Drivers for Automotive Application

Part No.	Display (dots)		Outputs		Operating Voltage (V)		Operating Temperature (°C)	Duty	Bias	I/F	EVR	GPO	Independent Blink	LED Driver	PWM Gen.	Keyscan	Package	Automotive Grade AEC-Q100
	seg.	com.	I/F Power Supply (V _{DD})	LCD Power Supply (VLCD)														
BU97601FV-M	116	29	4		2.7 to 6.0		-40 to +85	1/4, 1/3, 1/2, Static	1/3, 1/2	3wire +KEYOUT	✓	16port (16ch PWM)	—	—	6ch 9bit	4x5 Max 20Key	SSOP-B40	YES
BU9797FUV-M	144	36	4		2.5 to 5.5		-40 to +85	1/4	1/3, 1/2	2wire	—	—	—	—	—	—	TSSOP-C48V	YES
BU97510CKV-M	216	54	4		2.7 to 6.0		-40 to +85	1/4, 1/3	1/3, 1/2	3wire	—	6port (6ch PWM)	—	—	6ch 8bit	—	VQFP64	YES
BU97520AKV-M	276	69	4		2.7 to 6.0		-40 to +85	1/4, 1/3	1/3, 1/2	3wire +KEYOUT	—	6port (6ch PWM)	—	—	6ch 8bit	5x6 Max 30Key	VQFP80	YES
BU97540KV-M	335	67	5		2.7 to 6.0		-40 to +85	1/5, 1/4, 1/3, Static	1/3, 1/2	3wire +KEYOUT	✓	9port (9ch PWM)	—	—	9ch 9bit	5x6 Max 30Key	VQFP80	YES
BU97530KVT-M	445	89	5		2.7 to 6.0		-40 to +85	1/5, 1/4, 1/3, Static	1/3, 1/2	3wire +KEYOUT	✓	9port (9ch PWM)	—	—	9ch 8bit	5x6 Max 30Key	TQFP100V	YES
BU97550KV-M	528	66	8		2.7 to 6.0		-40 to +85	1/8, 1/7, 1/5, 1/4, 1/3, Static	1/4, 1/3, 1/2	3wire +KEYOUT	✓	9port (9ch PWM)	—	—	9ch 9bit	5x6 Max 30Key	VQFP80	YES
BU91795MUF-M	48	12	4		2.5 to 6.0		-40 to +105	1/4	1/3	2wire	—	—	—	—	—	—	VQFN24FV4040	YES
New BU91796BMUF-M	80	20	4		2.5 to 6.0		-40 to +105	1/4	1/3	2wire	—	—	—	—	—	—	VQFN32FBV050	YES
BU91796FS-M	80	20	4		2.5 to 6.0		-40 to +105	1/4	1/3	2wire	—	—	—	—	—	—	SSOP-A32	YES
BU91600FV-M	116	29	4		2.7 to 6.0		-40 to +105	1/4, 1/3, 1/2, Static	1/3, 1/2	3wire +KEYOUT	✓	16port (16ch PWM)	—	—	6ch 9bit	4x5 Max 20Key	SSOP-B40	YES
BU91797MUF-M	144	36	4		2.5 to 6.0		-40 to +105	1/4	1/3	2wire	—	—	—	—	—	—	VQFN48FV7070	YES
BU91797FUV-M	144	36	4		2.5 to 6.0		-40 to +105	1/4	1/3	2wire	—	—	—	—	—	—	TSSOP-C48V	YES
BU91600FUV-M	148	37	4		2.7 to 6.0		-40 to +105	1/4, 1/3, 1/2, Static	1/3, 1/2	3wire +KEYOUT	✓	16port (16ch PWM)	—	—	6ch 9bit	4x5 Max 20Key	TSSOP-C48V	YES
BU91799KV-M	200	50	4		2.5 to 6.0	2.5 to 6.0	-40 to +105	1/4	1/3	2wire	✓	—	—	—	—	—	VQFP64	YES
BU91501KV-M	204	51	4		2.7 to 6.0	4.5 to 6.0	-40 to +105	1/4, 1/3	1/3, 1/2	3wire +KEYOUT	—	4port	—	—	—	5x6 Max 30Key	VQFP64	YES
BU91510KV-M	216	54	4		2.7 to 6.0		-40 to +105	1/4, 1/3	1/3, 1/2	3wire	—	6port (6ch PWM)	—	—	6ch 6bit	—	VQFP64	YES
BU91520KV-M	276	69	4		2.7 to 6.0		-40 to +105	1/4, 1/3	1/3, 1/2	3wire +KEYOUT	—	6port (6ch PWM)	—	—	6ch 8bit	5x6 Max 30Key	VQFP80	YES
BU91530KVT-M	445	89	5		2.7 to 6.0		-40 to +105	1/5, 1/4, 1/3, Static	1/3, 1/2	3wire +KEYOUT	✓	9port (9ch PWM)	—	—	9ch 8bit	5x6 Max 30Key	TQFP100V	YES
BU91R63CH-M	176	44	4		2.7 to 6.0	2.7 to 6.0	-40 to +105	1/4, 1/3, 1/2, Static	1/3, 1/2	2wire	✓	—	—	—	—	—	Au Bump Chip	YES
BU91R64CH-M	320	80	4		2.7 to 6.0	2.7 to 6.0	-40 to +105	1/4, 1/3, 1/2, Static	1/3, 1/2	2wire/3wire	✓	—	✓	—	—	—	Au Bump Chip	YES
BU91R65CH-M	640	160	4		2.7 to 6.0	2.7 to 6.0	-40 to +105	1/4, 1/3, 1/2, Static	1/3, 1/2	2wire/3wire	✓	—	✓	—	—	—	Au Bump Chip	YES

Low Duty LCD Segment Drivers for Industrial Application

Part No.	Display (dots)	Outputs		Operating Voltage (V)		Operating Temperature (°C)	Duty	Bias	Interface	EVR	GPO	Independent Blink	LED Driver (port)	PWM Gen.	Keyscan	Package
		seg.	com.	I/F Power Supply (V _{DD})	LCD Power Supply (VLCD)											
BU97941FV-LB	104	26	4		1.8 to 3.6	2.7 to 5.5	-40 to +85	1/4, 1/3, Static	1/3	3wire	—	—	—	4	—	SSOP-B40
BU9795AFV-LB	108	27	4		2.5 to 5.5		-40 to +85	1/4	1/3, 1/2	3wire	—	—	—	—	—	SSOP-B40
BU97931FV-LB	112	28	4		1.8 to 3.6	2.7 to 5.5	-40 to +85	1/4, 1/3, Static	1/3	3wire	—	5port	✓	1	1ch 8bit	SSOP-B40

Common/Segment Drivers for Dot Matrix LCD

(LAPIS Technology products)

LCD Drivers								
Part No.	No. of Driver Output	Max Driving Display Size	Logic Supply Voltage (V)	Driver Supply Voltage (V)	Operating Temperature (°C)	Feature	Package	Halogen Free Support*1
ML9460	240	320x240 (QVGA)	2.5 to 5.5	up to 43	-30 to +75	Output change 240/200/160/120	Au bump chip	✓
ML9461B	320			2.6 to 5.5			Output change 320/240/200	Au bump chip

*1 A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.

Controller Drivers for Graphic LCD

(LAPIS Technology products)

LCD Controller Drivers									
Part No.	Max No. of Segment Outputs	Max Driving Display Size	Logic Supply Voltage (V)	Driver Supply Voltage (V)	Operating Temperature (°C)	Feature	Package	Halogen Free Support*1	Automotive Grade*2
ML9058E	132	132x65 dots	3.7 to 5.5	6 to 18	-40 to +85	Integrated RAM/ Boost circuit	Au bump chip	✓	YES
ML9059E		132x49 dots					Au bump chip	✓	YES
ML9445A	180	180x65 dots	2.7 to 5.5	6 to 18.5	-40 to +105	Integrated RAM/ Boost circuit/PWM	Au bump chip	✓	YES
ML9092-01	56	56x10 dots	4.5 to 5.5	4.5 to 16.5	-40 to +85	Integrated RAM/ Boost circuit	TQFP100-1414-0.50	✓	YES
ML9092-02	60	60x10 dots			-40 to +85	Integrated RAM/ Boost circuit	TQFP100-1414-0.50	✓	YES
ML9092-03					Integrated RAM				
ML9092-04					Integrated RAM/PWM				

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*2 Please inquire to the sales for AEC-Q100.

Controller Drivers for Low Duty LCD

(LAPIS Technology products)

LCD Controller Drivers (Package Product)														
Part No.	Max No. of Segment Outputs	Max No. of Driving Segments					Internal Oscillation Frame Frequency (Hz)	Logic Supply Voltage (V)	Driver Supply Voltage (V)	Operating Temperature (°C)	Feature	Package	Halogen Free Support*1	Automotive Grade*2
		static	1/2	1/3	1/4	1/5								
ML9470-12	80	80	160	—	—	—	—	3.0 to 5.5 (single)	—40 to +105	Supports external clock input	QFP100-1420-0.65	✓	YES	
ML9471		—	—	240	320	400					TQFP100-1414-0.50	✓	YES	
ML9472		60	60	120	—	—					—	TQFP80-1212-0.50	✓	YES
ML9473	—		—	180	240	300	TQFP80-1212-0.50	✓	YES					
ML9475	40	—	—	120	160	—	3V±10%/5V±10%	3.5 to 5.5	—40 to +105	Supports external clock input/ Bias generator built in/ EMS countermeasure built in	QFP56-910-0.65	✓	YES	
ML9476	16	—	—	48	64	—					TQFP48-0707-0.50	✓	YES	
ML9477	32	—	—	96	128	—	2.7 to 5.5	4.5 to 5.5	—40 to +105	Supports external clock input/ Bias generator built in	TQFP48-0707-0.50	✓	YES	
ML9484	50	50	100	150	200	—					TQFP64-1010-0.50	✓	YES	

LCD Controller Drivers (Gold Bump Product)																			
ML9480	40	40	80	120	160	—	65/75/85/95/ 130/150/170/190 command switching	2.7 to 5.5	4.5 to 5.5	—40 to +105	Supports external clock input/ Bias generator built in/ EMS countermeasure built in/ No external parts	Au bump chip	✓	YES					
ML9478C	80	80	160	240	320	—						65/75/85/95 command switching	2.7 to 5.5	4.5 to 5.5	—40 to +105	Supports external clock input/ Bias generator built in	Au bump chip	✓	YES
ML9479E	160	160	320	480	640	—	130/150/170/190 command switching	2.7 to 5.5	4.5 to 5.5	—40 to +105	Supports external clock input/ Bias generator built in						Au bump chip	✓	YES
ML9488	80	80	160	240	320	—						130/150/170/190 command switching	2.7 to 5.5	4.5 to 5.5	—40 to +105	Supports external clock input/ Bias generator built in	Au bump chip	✓	YES
ML9489	160	160	320	480	640	—											Au bump chip	✓	YES

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*2 Please inquire to the sales for AEC-Q100.

VFD Driver series

Anode/Grid Drivers for VFD

(LAPIS Technology products)

VFD Drivers									
Part No.	No. of Driver Output	Driving Target	VFD Driving Voltage (V)	Power Supply Type	Operating Temperature (°C)	Feature	Package	Halogen Free Support*1	Automotive Grade*2
ML9271	48	Anode/Grid	18	Positive supply	—40 to +105	Cascade connection	QFP64-1414-0.80	—	YES
ML9272	40		65				SSOP60-700-0.65	✓	YES

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*2 Please inquire to the sales for AEC-Q100.

Controller Drivers for Character VFD

(LAPIS Technology products)

VFD Controller Drivers									
Part No.	Display Pixels	VFD Driving Voltage (V)	Power Supply Type	Operating Temperature (°C)	Feature	Package	Halogen Free Support*1	Automotive Grade*2	
ML9208-xxGA	5x7 dots	VDD-42	Negative supply	—40 to +85	3-bit gradation	QFP64-1414-0.80	✓	—	
ML9208-xxMB						SSOP64-525-0.80	—	—	
ML9208A-xxGA						QFP64-1414-0.80	✓	—	
ML9208A-xxTB						TQFP64-1010-0.50	✓	—	
ML9209-xxGA	16 segs	42	Positive supply	—40 to +105	4-bit gradation	QFP44-910-0.80	—	—	
ML9289-xxGA	16 segs					QFP44-910-0.80	✓	—	
ML9289-xxTB	16 segs					TQFP48-0707-0.50	—	—	
ML9286-xxGA	5x7 dots					80	—40 to +105	Multigrad function/ 8-bit gradation/ Cascade connection	QFP80-1414-0.65
ML9286-xxTB		TQFP80-1212-0.50	✓	YES					

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*2 Please inquire to the sales for AEC-Q100.

Controller Drivers for Low Duty VFD

(LAPIS Technology products)

VFD Controller Drivers									
Part No.	Max No. of Driving Segments	VFD Driving Voltage (V)	Power Supply Type	Operating Temperature (°C)	Feature	Package	Halogen Free Support*1	Automotive Grade*2	
ML9212GA	64 (1/2Duty) 96 (1/3Duty)	18	Positive supply	—40 to +85	10-bit gradation/ Cascade connection	QFP56-910-0.65	✓	YES	
ML9213GP	112 (1/2Duty) 168 (1/3Duty)					TQFP80-1414-0.65	✓	YES	

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*2 Please inquire to the sales for AEC-Q100.

Car Clock Drivers

(LAPIS Technology products)

Car Clock									
Part No.	Display Duty	VFD Driving Voltage (V)	Logic Supply Voltage (V)	Operating Temperature (°C)	Supply Current (Max)	No. of Digit	Package	Halogen Free Support*1	Automotive Grade*2
ML9298	1/2	4.0 to 18	No need	—40 to +85	0.6mA	4digitsx1line and col.	SSOP32-430-1.00	✓	YES
ML9098B	Static, 1/2	3.0 to 5.5	3.0 to 5.5	—40 to +105		4digitsx1line and col., AM, PM	TQFP48-0707-0.50	—	YES

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