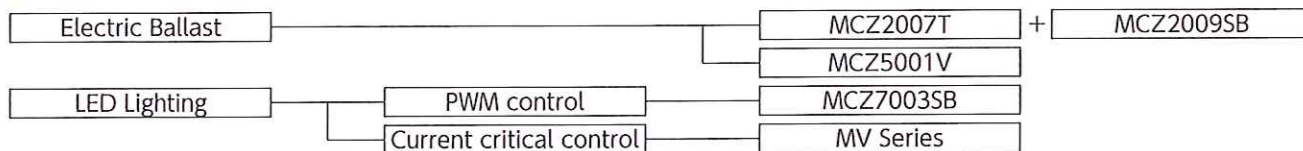


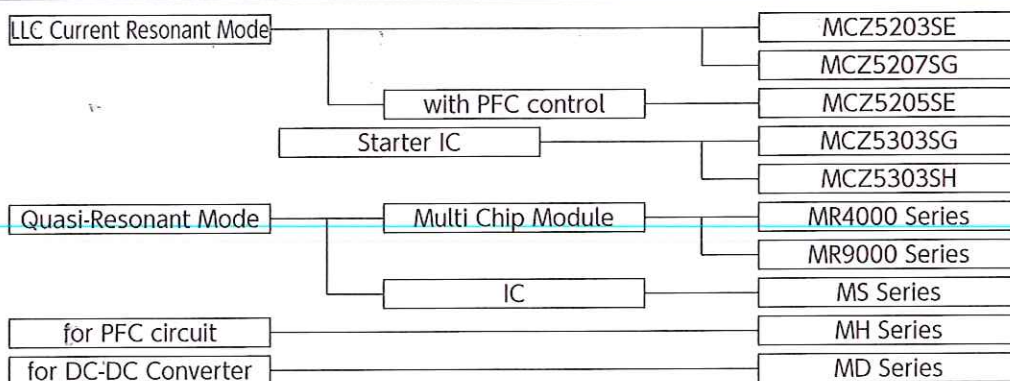
Power ICs

Line up

IC for Lighting



IC for Power Supply



IC for Motor Driver

MTD Series

IC for Interface

MTA Series

IC for Lighting

IC for Electric Ballast : MCZ series

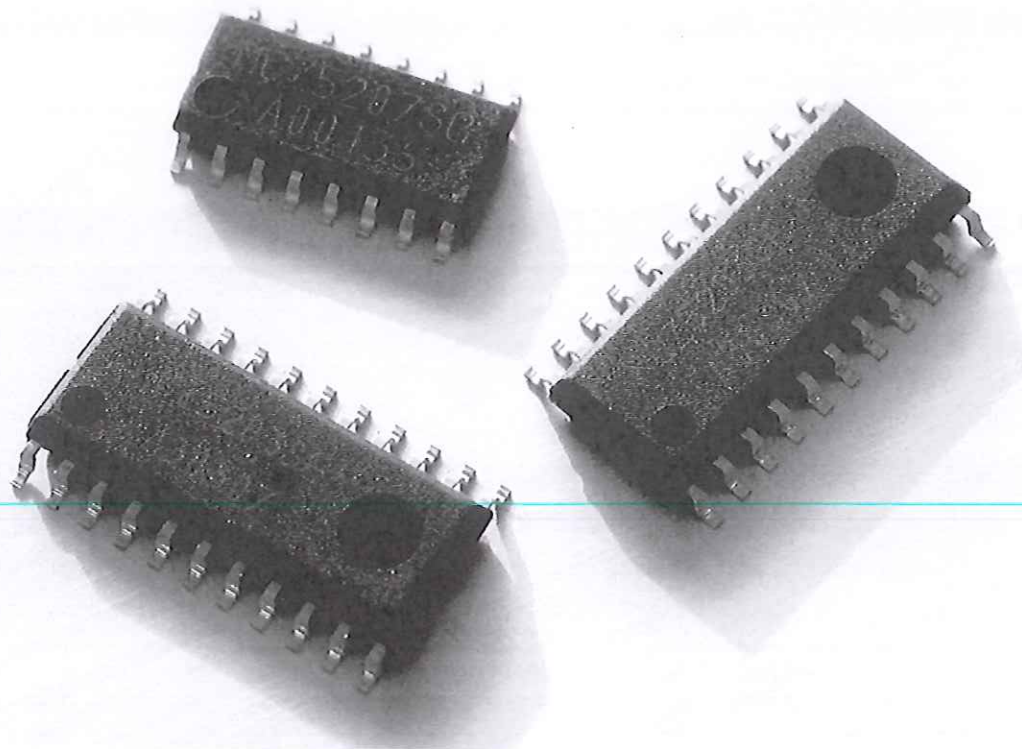
- Outline MCZ series is an IC for half bridge type current resonance ballast of the frequency modulation type. We have two type, the one is configured with a single chip with a High/Low-Side MOSFET driver and ballast controller, and the another have a PFC control circuit and ballast controller.

IC for LED Lighting : MCZ series

- Outline MCZ series for LED lighting is a constant current DC/DC converter control IC for fixed frequency PWM control, and has PFC circuit.

LED Driver IC : MV series

- Outline MV Series feature functions specialized for LED lighting, such as no auxiliary winding quasi-resonant operation, deep dimming and compatibility with illuminated light switches. And an off width modulation function allows for smooth deep dimming of 1% or less.



IC for Electric Ballast : MCZ Series

Type No.	Spec. Code	Type	High-side Driver [V]	PFC Control	Vin Applied Voltage [V]	Vcc [V]	Timer	Outline	
								Package	Fig.
MCZ2007T	-7062	Current Resonance Inverter HVIC Driver	600	-	-	11 to 15	-	SOP8	90
MCZ2009SB	-3072	Multiplier PFC & Current Resonance Inverter Controller	No	Yes	80 to 480	11 to 14.4	2 stage	SSOP34/32	105
MCZ5001V	-3072	Current Resonance Inverter Controller	600	No	50 to 480	11 to 15	3 stage	SSOP32/28	104



SOP8



SSOP34/32



SSOP32/28

IC for LED Lighting : MCZ Series

Type No.	Spec. Code	Type	High-side Driver [V]	Correspond Dimmer	ON/OFF	Frequency Reduction	Low Voltage	Timer	Outline	
									Package	Fig.
MCZ7003SB	-3072	Multiplier PFC & Fixed Frequency PWM Controller	600	Yes	Yes	Yes	Yes	Yes	SSOP34/32	105

LED Driver IC : MV Series

Type No.	Spec. Code	Type	Start-up Circuit	Output	ON/OFF	Illuminated Light Switch	Regulator Voltage[V]	Outline	
								Package	Fig.
MV1001SC	-5072	Current Critical Control	Yes	1ch	No	Yes	No	SOP8J	102
MV1002SC	-5072		(Out)			No			
MV1011SC	-5072		Yes			Yes			
MV1012SC	-5072		(Out)		No				
MV2002SG	-3072		(Out)		No	3.3			
MV2052SG	-3072		(Out)		No	5			



SOP8J



SOP16

☒ : New product

Power ICs

IC for Power Supply

LLC Current Resonant Mode Controller for Bridge Converter : MCZ Series

- Outline MCZ Series are an advanced symmetric LLC current resonant mode controller for Bridge Converter. Symmetric LLC resonant converter application is expanding widely due to its extremely high efficiency and low noise characteristics.

Starter IC Built-in Burst Function : MCZ5303

- Outline This is a dedicated IC providing a start-up circuit by low power.

Quasi-Resonant Power Supply ICs : MR4000 Series

- Outline The MR4000 series is an IC module for quasi-resonant power supplies which had a control IC and a main switching device built-in.
You can compose a quasi-resonant power supply corresponding to the standby of some attaching externally parts.

- Features
 - Stand-by mode (with burst-mode)
 - High efficiency , Low noise
 - No start-up resistance
 - Over-current protection
 - Over-voltage protection
 - Thermal shut down

Quasi-Resonant Power Supply ICs : MR9000 Series

- Outline The MR9000 series is an IC module for quasi-resonant power supplies which had a control IC and a main switching device built-in.

- Features
 - No latch function
 - Stand-by mode (2 types)
 - High efficiency , Low noise
 - No start-up resistance
 - Over-current protection
 - Over-voltage protection
 - Thermal shut down

IC for Quasi-Resonant Power Supply : MS Series

- Outline MS series consume less power in standby mode than conventional ICs. The ICs incorporate various functions to make it more user-friendly and to make it easier to design a power supply with fewer external components.

PFC Circuit Control IC : MH Series

- Outline MH series is the PFC circuit control IC which enabled multistage interleave.

LLC Current Resonant Mode Controller for Bridge Converter : MCZ Series

Type No.	Spec. Code	Type	High-side Drive	Vin Sensing	Vcc [V]	Capacitive mode Protection	Outline	
							Package	Fig.
MCZ5203SE	-3072	LLC Current Resonant Mode	Yes	Yes	14 to 28	Yes	SOP22	103
MCZ5205SE	-3072	LLC Current Resonant Mode with PFC Control						
MCZ5207SG	-3072	LLC Current Resonant Mode					SOP16	106



SOP22

SOP16

Starter IC Built-in Burst Function : MCZ5303

Type No.	Spec. Code	Vin Applied Voltage [V]	Vcc Output Voltage [V]	Drain Kick	Vin Sensing	Burst Function	Outline	
							Package	Fig.
MCZ5303SG	-3072	95 to 450	18.5	Yes	Yes	Yes	SOP16	106
MCZ5303SH	-5072				No		SOP8/7J	101



SOP16

SOP8/7J

Quasi-Resonant Power Supply ICs : MR4000 Series

Type No.	Spec. Code	Maximum Output [W]*			Main Switching		Outline	
		AC90 to 132V	AC180 to 276V	AC90 to 276V	Device	Vds [V]	Package	Fig.
MR4500	-7101	12 (Peak20)	-	-	MOSFET	500	FTO-7P	86
MR4510	-7101	25 (Peak40)						
MR4520	-7101	50 (Peak80)						
MR4530	-7101	80 (Peak100)						
MR4710	-7101	-	25 (Peak40)	12 (Peak20)	2nd G High Speed IGBT	900		
MR4720	-7101		50 (Peak80)	25 (Peak40)				
MR4010	-7101	-	70	45				
MR4020	-7101		105	70				
MR4030	-7101		135	90				
MR4040	-7101		180	120				

* : Maximum output capacity and input voltage range differ with design conditions.



FTO-7P

Quasi-Resonant Power Supply ICs : MR9000 Series

Type No.	Spec. Code	Maximum Output [W]*			Main Switching		Bottom Skip	Outline	
		AC90 to 132V	AC180 to 276V	AC90 to 276V	Device	Vds [V]		Package	Fig.
MR9520	-7101	50 (Peak80)	-	-	MOSFET	500	1 skip	FTO-7P	86
MR9010	-7101	-	70	45	2nd G High Speed IGBT	900	1 skip		
MR9011	-7101						2 skip		
MR9020	-7101						1 skip		
MR9021	-7101						2 skip		

* : Maximum output capacity and input voltage range differ with design conditions.



FTO-7P

IC for Quasi-Resonant Power Supply : MS Series

Type No.	Spec. Code	Type	Vin [V]	Vcc [V]	Stand-by Operation	Bottom Skip	Outline	
							Package	Fig.
MS1003SH	-5072	Quasi-resonant RCC	95 to 450	11 to 24	S-Stby mode	1 skip	SOP8/7J	101
MS1004SH	-5072					2 skip		
MS1005SK	-3072					SOP14	107	
MS1006SK	-3072							2 skip



SOP8/7J

SOP14

PFC Circuit Control IC : MH Series

Type No.	Spec. Code	Operation Mode		Vin Sensing	Vcc [V]	Single Operation	Outline	
		Master	Slave				Package	Fig.
MH2501SC	-5072	Master	Current Critical Mode	Unnecessary	13 to 23	Enable	SOP8J	102
MH2511SC	-5072	Slave	Synchronizes with Master IC		11 to 23	Disable		



SOP8J

Power ICs

Power ICs

IC for Power Supply

DC-DC Converter Power ICs : MD Series

- Outline MD series is a non-isolated DC-DC converter IC.
By combining the principal components into one package, it resolves the difficulties of designing power circuits.

- Features
 - High efficiency
 - Wide frequency
 - Built-in various protection functions

DC-DC Converter Power ICs : MD Series												
Type No.	Spec. Code	Input Voltage [V]	Output Voltage [V]	Output Current [A]	Frequency [kHz]	Operation Temp [°C]	Rectification System	Outline				
								Package	Fig.			
MD5001T	-7062	4.5 to 14	0.8 to 12 *2	0 to 1	100 to 500 *4	-40 to 85	Fly wheel SBD	SOP8	90			
MD5021T	-7062			0 to 2								
MD5031T	-7062			0 to 1								
MD3221N	-3072	4.5 to 20	2.5/3.3 *1 0.8 to 14 *2	0 to 3	100/300 *3	-30 to 85	Synchronous	SSOP32	83			
MD3221R	-3072							LSSOP26	84			
MD3222N	-3072							2.5/3.3 *1 0.8 to 14 *2	0 to 6	SSOP32	83	
MD1222N	-3072	8 to 20	2.5 to 12 *2	0 to 5	250	-10 to 80	Fly wheel SBD	HSOP28	81			
MD1320F	-3072	12 to 30	3.3/5 *1	0 to 3								
MD1322F	-3072	8 to 30	2.5 to 12 *2	0 to 1.5				100 to 500 *4	-30 to 85	Synchronous	SSOP32	83
MD1320N	-3072		3.3/5 *1	0 to 1.8								
MD1322N	-3072		2.5 to 12 *2	0 to 5	LSSOP26	84						
MD1323R	-3072	8 to 40	2.5 to 12 *2	0 to 3	250	-30 to 85	Synchronous	SSOP32	83			
MD1333N	-3072							3.3/5 *1	0 to 5			
MD1421N	-3072							2.5 to 12 *2	0 to 3	100 to 500 *4	LSSOP26	84
MD1422N	-3072	8 to 40	2.5 to 12 *2	0 to 3	100 to 500 *4	-30 to 85	Synchronous	SSOP32	83			
MD1423N	-3072							2.5 to 12 *2	0 to 3	100 to 500 *4	LSSOP26	84
MD1423R	-3072							0.8 to 12 *2	0 to 3	100 to 500 *4	LSSOP26	84
MD1424R	-3072	8 to 40	0.8 to 12 *2	0 to 3	100 to 500 *4	-30 to 85	Synchronous	LSSOP26	84			

*1 : Selectable output voltage 3.3V/5V
*2 : Adjustable output voltage
*3 : Selectable 100k/300kHz
*4 : Adjustable from 100k to 500kHz



SOP8



LSSOP26



SSOP32



HSOP28

Power ICs

IC for Motor Driver

Stepping Motor Driver ICs : MTD Series

- Outline MTD series is monolithic ICs that fewer external parts, can directly drive any motors.
- Applications
 - For office equipment products
 - For industrial robots, automatic equipments

IC for Interface

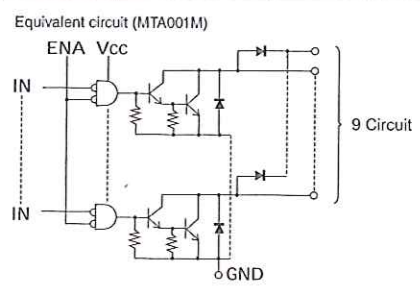
Power ICs for Interface : MTA Series

- Outline It is a power monolithic transistor array that can drive an electric power load.
The output and circuit that can directly control by a CPU or a gate array is two or more built-in.

Stepping Motor Driver ICs : MTD series									
Type No.	Spec. Code	Operation	I _o [A]	V _o [V]	Characteristics	Outline			
						Package	Fig.		
MTD1120	-7101	Unipolar	1.2	80	4-Phase Input	ZIP27	89		
MTD1120F	-3072					HSOP28	81		
MTD1121F	-3072					HSOP28	81		
MTD1361F	-3072		1.5	68	DMOS, 4-Phase Input	HSOP28	81		
MTD1361	-7101					ZIP27	89		
MTD1375F	-3072					HSOP28	81		
MTD2002F	-3072	Bipolar	0.8	35	2-bit Digital Current Selection	HSOP28	81		
MTD2017F	-3072				Quarter Step Operation	HSOP24	91		
MTD2017G	-3072					HSOP28	81		
MTD2018F	-3072					HSOP24	91		
MTD2018G	-3072				1	40	Dual Motor Driver	HSOP40	82
MTD2038G	-3072		Quarter Step Operation	HSOP28			81		
MTD2525J	-3072		1.2	35	2-bit Digital Current Selection	HSOP28	81		
MTD2007F	-3072					ZIP27	89		
MTD2003F	-3072					HSOP24	91		
MTD2003B	-7101		1.3	50	Dual Motor Driver	SZIP32	93		
MTD2003G	-3072					HSOP24	91		
MTD2003S	-7101					HSOP28	81		
MTD2009J	-3072		1.5	40	Current Decay Mode	HSOP40	82		
MTD2006F	-3072					HSOP28	81		
MTD2006G	-3072					HSOP24	91		
MTD2005	-7101	1.5	50	2-bit Digital Current Selection	ZIP27	89			
MTD2005F	-3072				HSOP28	81			
MTD2033G	-3072				HSOP24	91			
MTD2029J	-3072			Quarter Step Operation	HSOP40	82			



Power ICs for Interface : MTA Series									
Type No.	Spec. Code	Absolute Maximum Ratings (Ta=25°C)			Operation			Outline	
		V _{CEO} [V]	I _o [A]	P _D [W]	Input	Output	Circuits	Package	Fig.
MTA001M	-7101	80	2	5	L Active	NPN Darlington	9	ZIP27	89
MTA011	-7101				H Active				
MTA002	-7101	60			L Active	PNP Darlington			



We are happy to provide circuit design support for safe use of our IC products. Please consult our sales representatives.

Power ICs