CMDRBR (Dr. Bridge Controller)

Replace 4 Bridge Diodes Compact and Self-Powered
Simple and Easy to Construct an **Almost No Loss** Ideal Diode Bridge

GENERAL DESCRIPTION

CMDRBR is an industry first controller IC for Almost No Loss Ideal Diode Bridge.

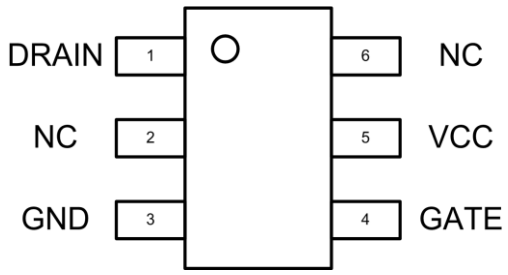
CMDRBR is a compact controller IC that can be used with an N-channel Super Junction Mosfet (SJMOS) in full-bridge or half-bridge rectifier topologies for AC rectification. It is developed to drive an external SJMOS to emulate an ideal diode. **CMDRBR** in SOT-23 6L-1 package (very compact). For bridge topology applications, is self-powered and does not require any external power. The traditional diode bridge rectifiers can be replaced with **CMDRBR** solution to minimize diode forward conduction losses and gain more efficient AC/DC power conversion.

FEATURES

- Patented Pending
- **No Need High-Side Driver**
- **Self-Powered with No External Power**
- **No Load Consumption < 20mW (4 Ideal Diodes @230Vac, when full circuit formed as a Dr. Bridge only; to replace traditional 4 Bridge Diodes)**
- Low Forward-Voltage Drop and Almost No Power Dissipation Compared to Traditional Diode Bridge
- Maximizing Power Efficiency
- Reducing Heat, Eliminating Thermal Design Problems
- Low Operation Current ~ 20uA
- Compact Package
- Easy to Use
- SMPS/Adaptors/Charger

PIN CONFIGURATION

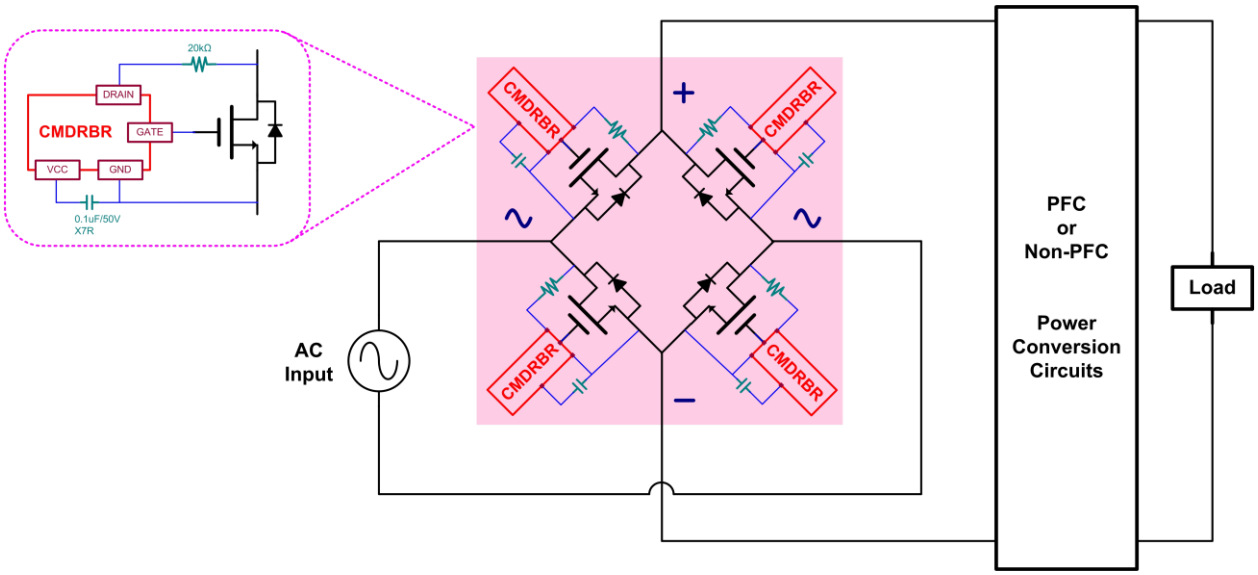
SOT-23 6L-1 Package
(TOP View)



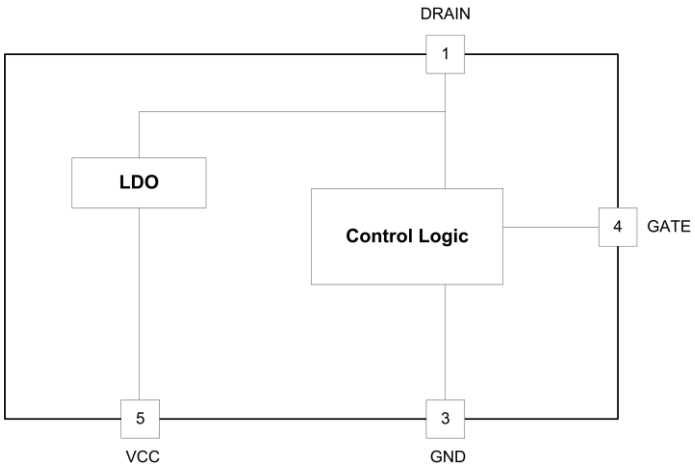
FUNCTIONAL PIN DESCRIPTION

Pin Name	Pin Function
DRAIN	Connect to Drain of the external MOSFET
GND	Ground of the controller. Connect to Source of the external MOSFET
GATE	Gate Drive output pin. Connect to the Gate of the external MOSFET
VCC	Supply Voltage pin.

APPLICATIONS



SIMPLIFIED BLOCK DIAGRAM



Product and Packing Information

Part No.	Package Type	Packing Type	Marking
CMDRBR	SOT-23 6L-1	3K pcs / 7” reel	BRxx

Note: xx : year & week code

ABSOLUTE MAXIMUM RATINGS*1

Parameters	Value/Limit	Unit
DRAIN to GND	-0.3 to 800	V
GATE to GND	-0.3 to 27	V
VCC to GND	-0.3 to 27	V
T_J, Junction Temperature	150	°C
$T_{operation}$, Operating Temperature Range	-40 to 125	°C
T_{stg}, Storage Temperature Range	-65 to 150	°C
Package Thermal Resistance*2 SOT-23 6L-1, θ_{JA}	260.7	°C /W
Maximum Power Dissipation*3	0.38	W

Note:
*1: Exceeding these ratings may damage the device.
*2: θ_{JA} is measured in natural convection (still air) at T_A=25°C with the component mounted on a low effective thermal conductivity test board of JEDEC 51-3 thermal measurement standard.
*3: T_A=25°C. The maximum allowable power dissipation is a function of the maximum junction temperature $T_{J(max)}$, the junction-to-ambient thermal resistance θ_{JA} , and the ambient temperature T_A. The maximum allowable continuous power dissipation at any ambient temperature is calculated by $P_{D(max)}=(T_{J(max)}-T_A)/\theta_{JA}$.

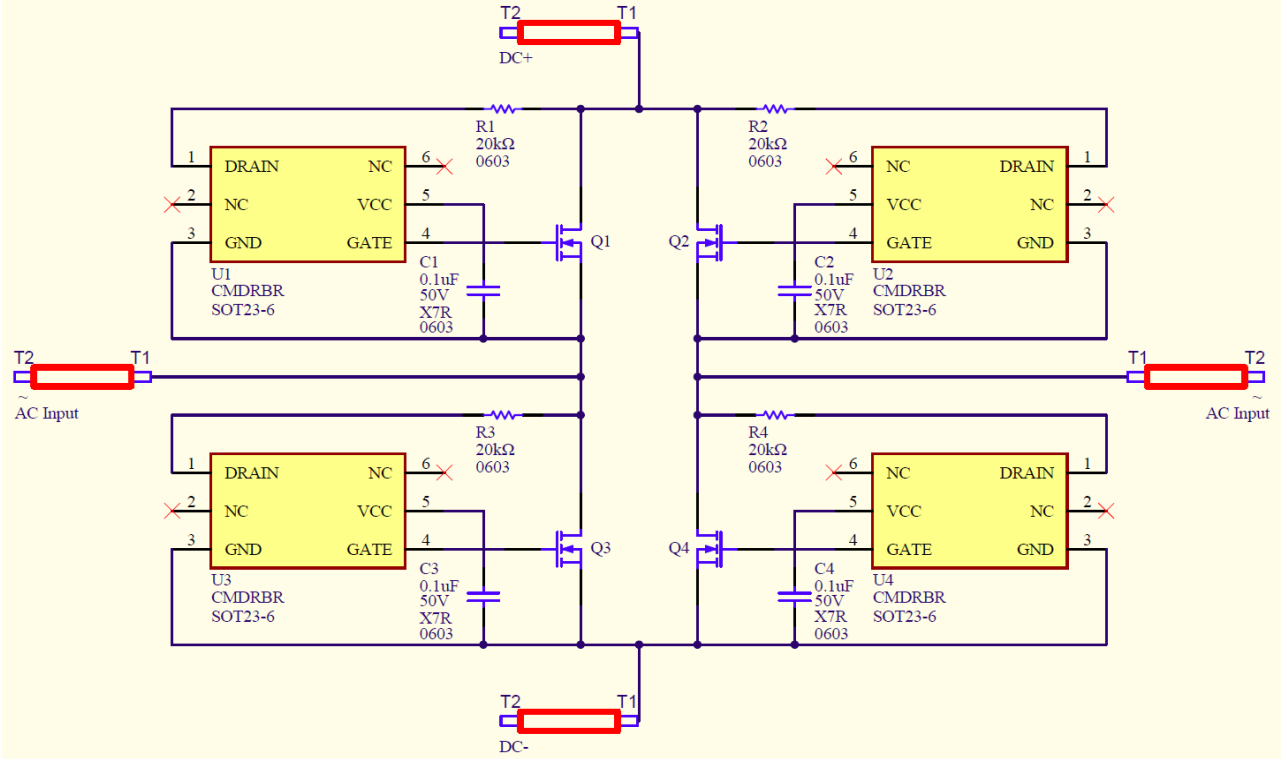
ELECTRICAL CHARACTERISTICS

T_A = 25°C, unless otherwise specified.

PARAMETER	SYMBOL	TEST CONDITIONS	Value			
			Min	Typ	Max	Unit
Minimum Switch-On Voltage across External MOSFET's Body Diode	$V_{DRAIN\ to\ GND}$ $V_{th(turn-on)}$	External MOSFET V_{GS}=0V, VCC=15V, add 20kΩ in series with DRAIN, GATE connects 100kΩ to GND.	-250	-	-60	mV
VCC IC's ON threshold IC's OFF threshold	 UVLOon UVLOoff		 7 7	 7.4 7.4	 8 8	 V V
IC's Operation Current	I_{CCQ}	VCC=15V	4	-	20	uA
GATE Turn-OFF Threshold	$V_{th(turn-off)}$	Wafer based online trimming	-5	-	0	mV
GATE Turn-ON Delay	$T_{delay(turn-on)}$	VCC=15V, add 20kΩ in series with DRAIN, GATE connects 100kΩ to GND, Input=±300mV, 60Hz Square Wave.	10	-	50	us
GATE Turn-OFF Delay	$T_{delay(turn-off)}$	VCC=15V, add 20kΩ in series with DRAIN, GATE connects 100kΩ to GND, Input=±300mV, 60Hz Square Wave.	3	-	10	us

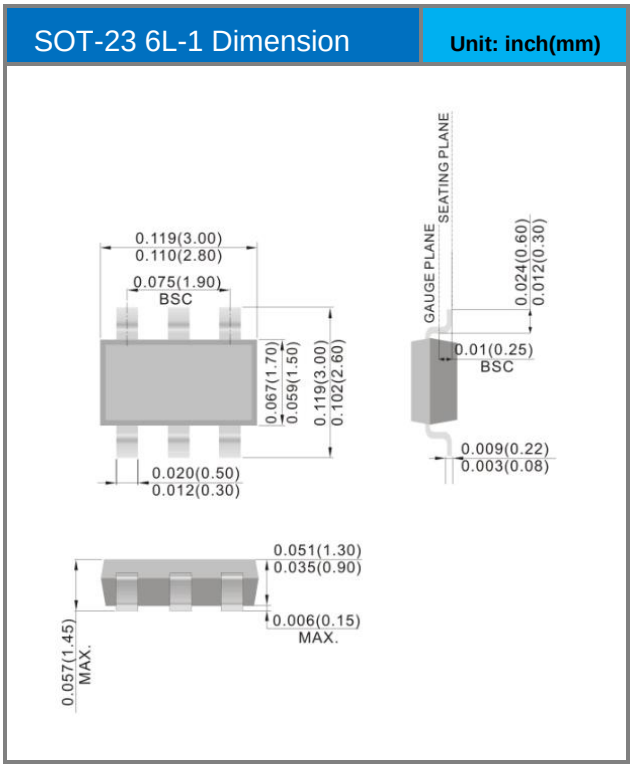
Propagation Delay + Rising Time	$T_{pd} + T_{rising}$	VCC=15V, add 20kΩ in series with DRAIN, GATE connects 1000pF to GND, Input=±300mV, 60Hz Square Wave. Measure the time from Input=-100mV to GATE pin = 7V	15	-	85	Us

TYPICAL FULL-BRIDGE RECTIFIER APPLICATION

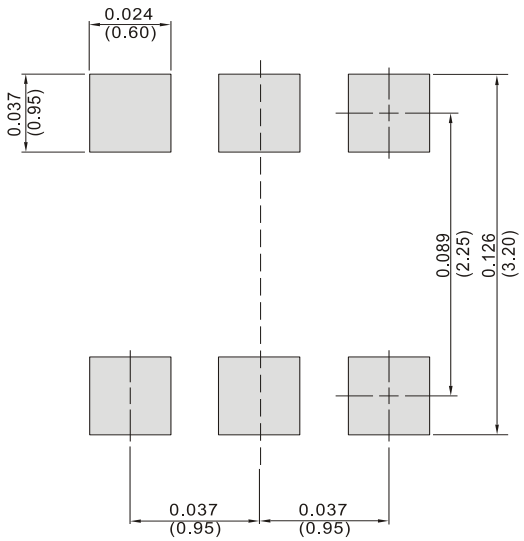


PACKAGE DIMENSION

SOT-23 6L-1 Dimension — Unit: inch(mm)



SOT-23 6L-1 Pad Layout — Unit: inch(mm)



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