

MITSUBISHI SEMICONDUCTORS <HVIC> M63954P

HIGH VOLTAGE HALF BRIDGE DRIVER

DESCRIPTION

M63954P is high voltage integrated circuit designed for electronic ballast, Power MOSFET and IGBT module driver for half bridge applications.

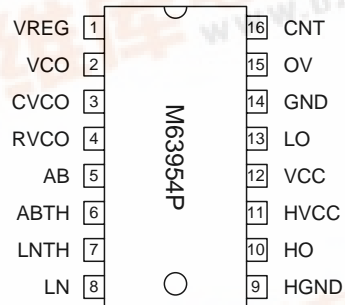
FEATURES

- FLOATING SUPPLY VOLTAGE600V
- OUTPUT CURRENT±500mA
- HALF BRIDGE DRIVER
- BUILT-IN OSCILLATOR
- DIP_16 PACKAGE
- BUILT-IN REGULATOR

APPLICATIONS

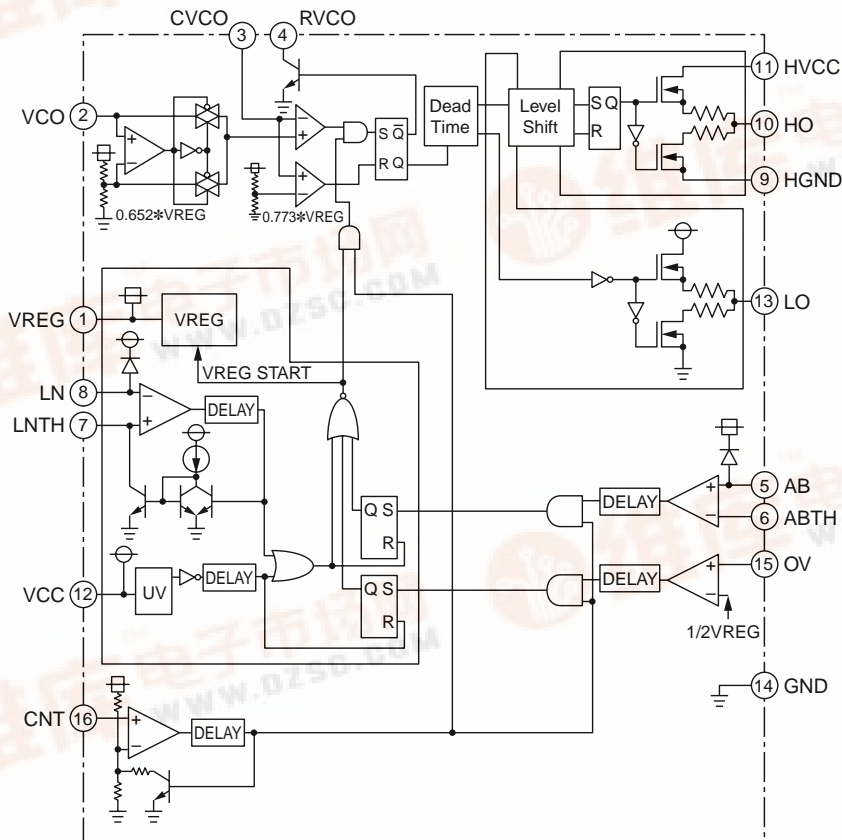
The M63954P can be used for fixed or continuous lamp control of fluorescent lamp inverter.

PIN CONFIGURATION (TOP VIEW)



PACKAGE TYPE 16P4

BLOCK DIAGRAM



HIGH VOLTAGE HALF BRIDGE DRIVER

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Conditions	Ratings	Unit
HGND	High Side Floating Supply Offset Voltage		600	V
HVCC	High Side Floating Supply Voltage	HGND=GND	-0.5~+20	V
VCC	Low Side Fixed Supply Voltage		-0.5~+20	V
VOV	OV Input Voltage		-0.5 ~ VCC+0.5	V
VAB	AB Input Voltage		-0.5 ~ VCC+1.0	V
IAB	AB Input Current		2	mA
VABTH	ABTH Input Voltage		-0.5 ~ VCC+0.5	V
VLN	LN Input Voltage		-0.5 ~ VCC+1.0	V
ILN	LN Input Current		2	mA
VLNTH	LNTH Input Voltage		-0.5 ~ VCC+0.5	V
VVCO	VCO Input Voltage		-0.5 ~ VCC+0.5	V
IHO	High Side Output Current		±500	mA
ILO	Low Side Output Current		±500	mA
Pt	Package Power Dissipation	Ta = 25°C, On Board	1.56	W
K θ	Linear Derating Factor	Ta > 25°C, On Board	12.5	mW/°C
Rth(j-c)	Junction-Case Thermal Resistance		25	°C/W
Tj	Junction Temperature		150	°C
Topr	Operation Temperature		-20 ~ +80	°C
Tstg	Storage Temperature		-40 ~ +125	°C

ELECTRICAL CHARACTERISTICS (Ta=25°C, GND=HGND, VCC=HVCC=15V, unless otherwise specified)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
HVCC	High Side Floating Supply Voltage	HVCC-HGND	13	15	17	V
VCC	Low Side Fixed Supply Voltage		13	15	17	V
VREG	Internal Supply Voltage	VCC=15V, NO Load	6.9	7.2	7.5	V
ICC1	Standby Current	VCC=15V, CNT=5V, OV=5V	—	0.75	1.0	mA
ICC2	ON Suspension Oscillate Current	VCC=15V, CNT=0V	—	2.0	4.0	mA
ICC3	ON Oscillation Current (50Hz)	VCC=15V, RVCO1=15kΩ, VVCO=0.33VREG	2.0	5.0	8.0	mA
ICC4	ON Oscillation Current (115kHz)	RVCO2=39kΩ, CVCO=100pF, VVCO=0.42VREG	2.0	8	12	mA
VUVr	VCC UV Reset Voltage		9.0	10	11	V
VUVt	VCC UV Trip Voltage		5.5	6.5	7.5	V
tUV	VCC Supply UV Filter Time		14	—	100	μs
VOV	OV Protection Vth		3.4	3.6	3.8	V
tOV	OV Filter Time		30	—	150	μs
IOV	OV Input Leak Current	VOV=0V	-0.5	-0.08	—	μA
fVCO	VCO Frequency Set Up Limit		—	—	250	kHz
fO	Output Frequency Set Up Limit	LO, HO	—	—	125	kHz
VVCO	VCO Input Voltage Limit		1.5	—	VREG-1.5	V
IVCO	VCO Input Leak Current	VVCO=0V	-2	-0.66	—	μA
VCVCO	CVCO Input Voltage	VREG=7.2V	5.5	5.55	5.6	V
ICVCO	CVCO Input Leak Current	VCVCO=0V, VVCO >VCVCO	-2	-0.66	—	μA
IrvCO	RVCO Leak Current	VCVCO=0V, VREG=7.2V, VRVCO=10V	—	—	0.5	μA
IVSRVCO	RVCO Saturation Voltage	VCVCO=6V, VREG=7.2V, IRVCO=10mA	—	—	500	mV

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ELECTRICAL CHARACTERISTICS (Ta=25°C, GND=HGND, VCC=HVCC=15V, unless otherwise specified)

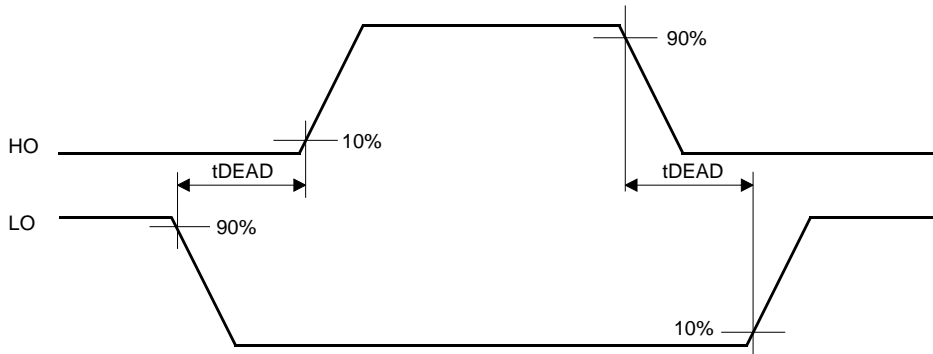
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
VLN	LN Input Voltage Limit		1.0	—	VCC-1.5	V
VLNTH	LNTH Input Voltage Limit		1.0	—	VCC-1.5	V
VLNIO	LN Offset Voltage		-50	—	50	mV
ILN	LN Input Leak Current	VLN>VLNTH	-1	-0.22	—	μA
ILNTH	LNTH Input Leak Current	VLN>VLNTH, VCC<VUVr	-1	-0.22	—	μA
ILNTHh	LNTH Input Hysteresis Current	VLN > VLNTH, VLNTH=5V	20	40	80	μA
tLN	LN Filter Time		14	—	100	μs
VAB	AB Input Voltage Limit		0	—	VREG-1.5	V
VABTH	ABTH Input Voltage Limit		0	—	VREG-1.5	V
VABIO	AB Offset Voltage		-50	—	50	mV
IAB	AB Input Leak Current	VAB<VABTH	-0.5	-0.08	—	μA
IABTH	ABTH Input Leak Current	VAB>VABTH	-0.5	-0.08	—	μA
tAB	AB Filter Time		30	—	150	μs
VCNT	CNT Input Threshold Voltage		3.4	3.6	3.8	V
VCNTth	CNT Input Hysteresis Voltage		0.8	1.0	1.2	V
ICNT	CNT Input Leak Current	VCNT=0V	-0.5	-0.08	—	μA
tCNT	CNT Filter Time		30	—	150	μs
IRFC	Floating Supply Leak Current	VHGND=600V	—	—	1.0	μA
tDEAD	Dead Time	C=1000pF	1.0	—	1.9	μs
VHOH1	HO Output Voltage	IHO=0mA	14	14.4	—	V
VHOH2		IHO=-20mA	10	13	—	V
VHOH3		IHO=-200mA	1.0	5.5	—	V
VHOL1		IHO=0mA	—	5	100	mV
VHOL2		IHO=20mA	—	0.5	1.0	V
VHOL3		IHO=200mA	—	6	12	V
VLOH1	LO Output Voltage	ILO=0mA	14	14.4	—	V
VLOH2		ILO=-20mA	10	13	—	V
VLOH3		ILO=-200mA	1.0	5.5	—	V
VLOL1		ILO=0mA	—	5	100	mV
VLOL2		ILO=20mA	—	0.5	1.0	V
VLOL3		ILO=200mA	—	6	12	V
tr	Output Rise Time	Amplitude 10% → 90%, C=1000pF	—	50	120	ns
tf	Output Fall Time	Amplitude 90% → 10%, C=1000pF	—	50	120	ns

OUTPUT FREQUENCY (RVCO1=15kΩ, RVCO2=15kΩ, CVCO=100pF)

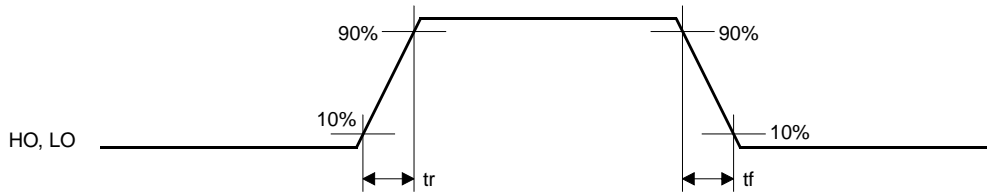
Oscillation Frequency	VCO Input Voltage	Min.	Typ.	Max.	Unit
50kHz	0.33VREG	—	50	—	kHz
60kHz	0.42VREG	—	60	—	kHz

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DEAD TIME

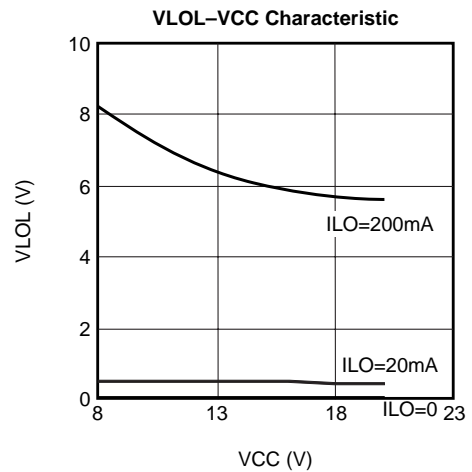
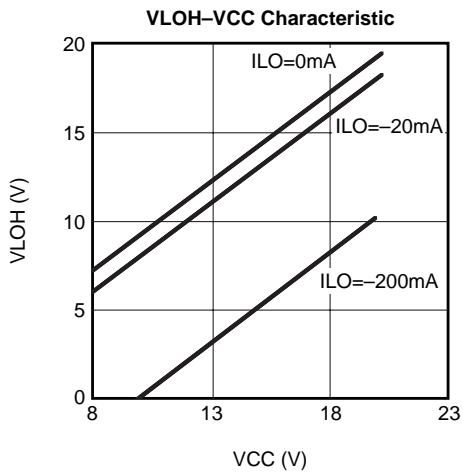
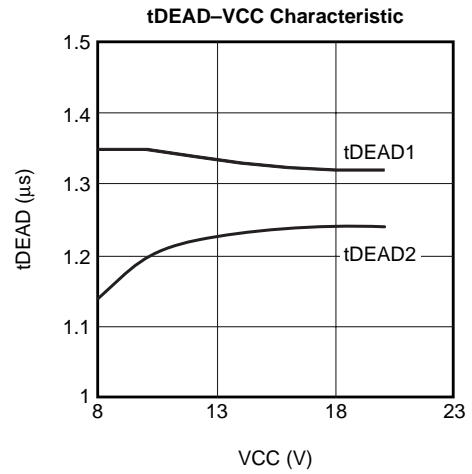
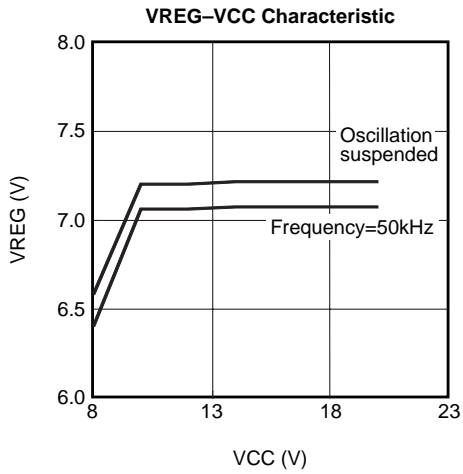
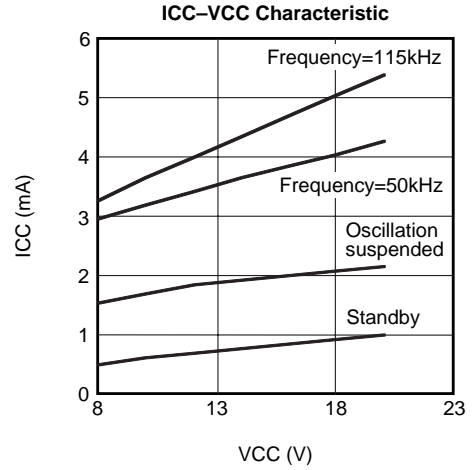
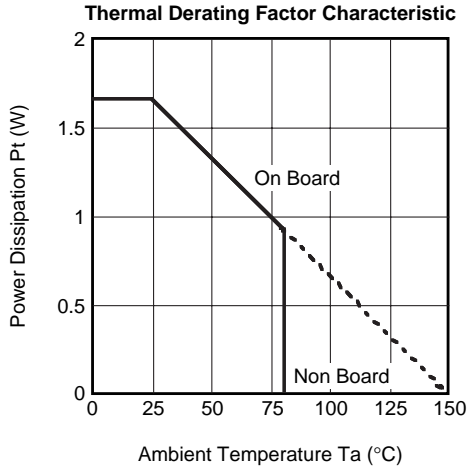


**OUTPUT RISE TIME
FALL TIME**



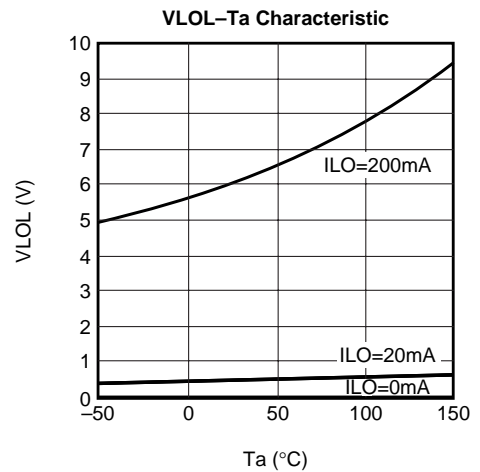
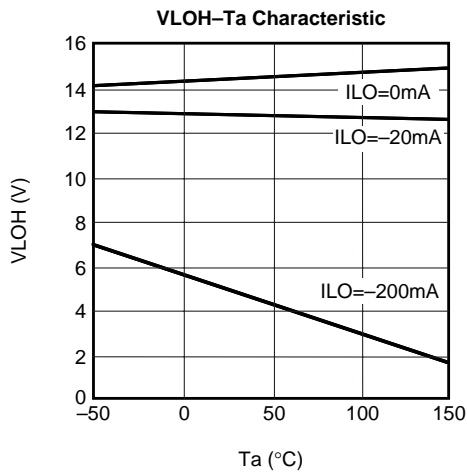
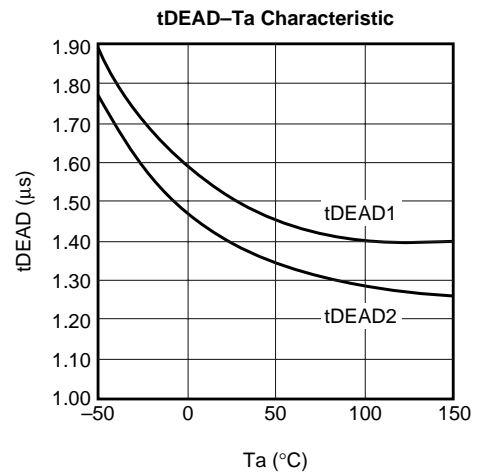
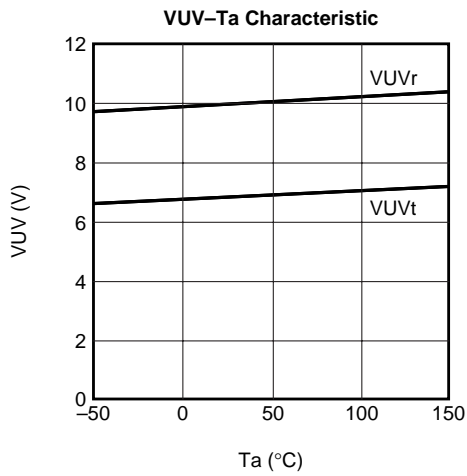
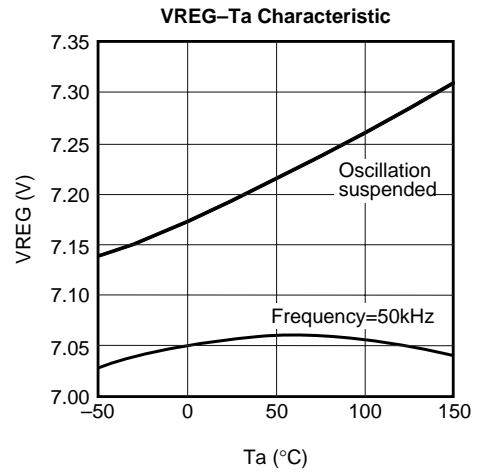
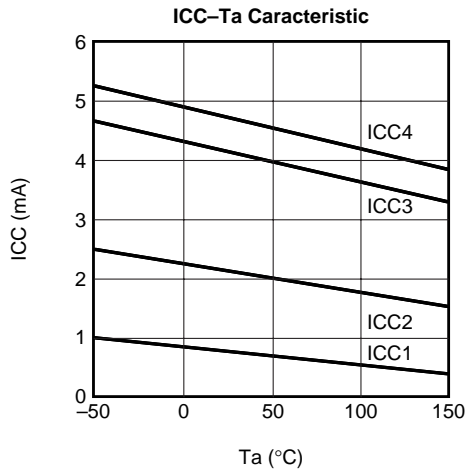
HIGH VOLTAGE HALF BRIDGE DRIVER

PERFORMANCE CURVES



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M63954P

HIGH VOLTAGE HALF BRIDGE DRIVER

PACKAGE OUTLINE

16P4

Plastic 16pin 300mil DIP

