描述

相比 MX6501T 产品， MX6505T 增加了外接振荡器来调节振荡频率的选项， 是一款低噪声推挽式变压器驱动，专为小尺寸隔离式电源设计。它采用 3.3V~5V 直流电源供电，增加了 EN 控制，当客户想低静态功耗时候可以关断改芯片， 由于 D1 和 D2 耐压 36V， 这款新品也可以采用 12V 供电这时候，只要把 12v 采用分压电阻的方式给 VCC 提供 5V 供电就可以实现 12V 转 12V 的功能。

MX6505T 由一个振荡器和一个栅极驱动电路组成，栅极驱动电路提供互补信号驱动相应的 N-MOS。该器件包括两个 1A 功率 MOSFET。可以使用外部时钟调节频率。

MX6505T的保护功能包括欠压锁定、热关断 150C 保护和死区控制电路。MX6505T 具有 420kHz 内部振荡器，适用于需要更高效率和更小变压器尺寸的应用。MX6505T 采用小型 SOT23-6 封装。

特性

♦宽输入电源供电： 3.3V~5V
♦ 变压器推挽式驱动
♦ 高驱动能力: 1A@5V
♦ 低噪声
♦ 扩频时钟
♦ 内部振荡器 420kHz
♦外部时钟调节频率
♦ 低关断电流: <1μA
♦ 热关断
♦ 小型 6-Pin SOT23 封装

应用

♦ 用于 CAN、RS-485、RS-422、RS-232、SPI、I2C 和低功耗 LAN 的隔离电源
♦ 低噪声 USB 电源
♦ 过程控制
♦ 电信用品
♦ 无线电用品
♦ 分布式用品
♦ 医疗仪器
♦ 精密仪器

基本信息

订购信息

型号	描述
MX6505	SOT23-6
MPQ	3000pcs

封装功耗

封装	RθJA（℃/W）
SOT-23 (6)	108.1

极限值

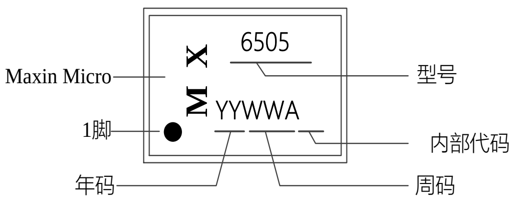
参数	值
VCC	-0.5 to 7V
EN, CLK	-0.5 to VCC+0.5V
D1, D2	-0.3 to 36V
$I_{(D1)\,PK}$, $I_{(D2)\,PK}$	2.4A
结温, T_J	150℃
存储温度, T_{stg}	-65 to 150℃
引脚焊锡温度 （soldering,10secs）	260℃
ESD 敏感性 HBM	±2000V

超出极限值中列出的范围可能会对设备造成永久性损坏。长时间工作在极限值条件下可能会影响可靠性。不建议设备在超出“推荐操作条件”部分中指示的任何条件下的功能运行。

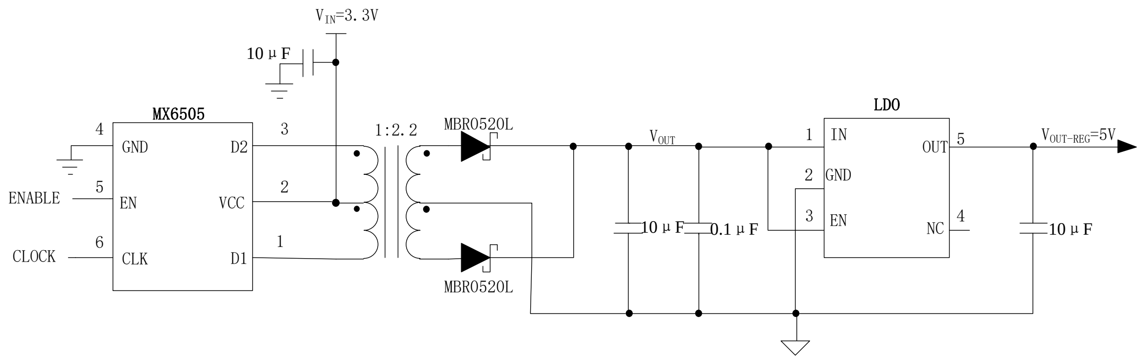
推荐工作条件

项目	范围
VCC	2.25 to 5.5V
I_{D1}, I_{D2}	1A(max)
工作温度	-40 to 125℃
湿气敏感度	MSL3

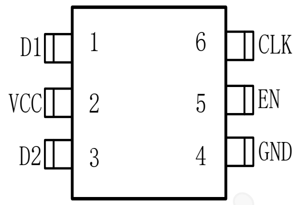
标签信息



Typical application



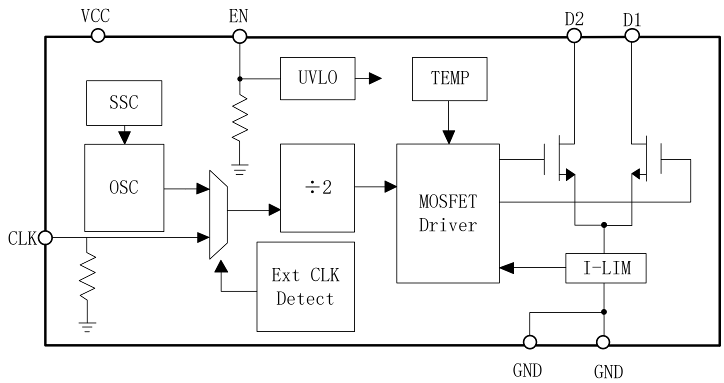
Terminal assignments



1. Pin information

PIN NO.	PIN name	Description
1	D1	Open drain output of the first power MOSFETs. Typically connected to the outer terminals of the center tap transformer. Because large currents flow through these pins, their external traces should be kept short.
2	VCC	This is the device supply pin. It should be bypassed with a 4.7μF or greater, low ESR capacitor. When VCC ≤ 2.25V, an internal undervoltage lockout circuit trips and turns both outputs off.
3	D2	Open drain output of the second power MOSFETs. Typically connected to the outer terminals of the center tap transformer. Because large currents flow through these pins, their external traces should be kept short.
4	GND	GND is connected to the source of the power MOSFET switches via an internal sense circuit. Because large currents flow through it, the GND terminals must be connected to a low-inductance quality ground plane.
5	EN	The EN pin turns the device on or off. Grounding this pin disables all internal circuitry. If unused this pin should be tied directly to VCC or leaving this pin floating.
6	CLK	This pin is used to run the device with external clock. Internally it is pulled down to GND. If valid clock is not detected on this pin, the device shifts automatically to internal clock.

Function Block diagram

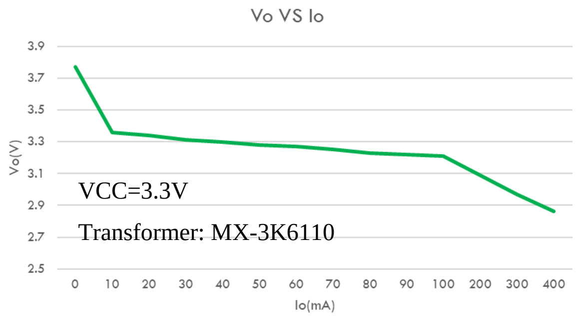


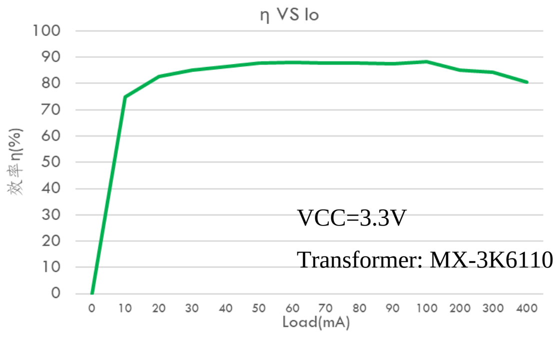
Electrical characteristics

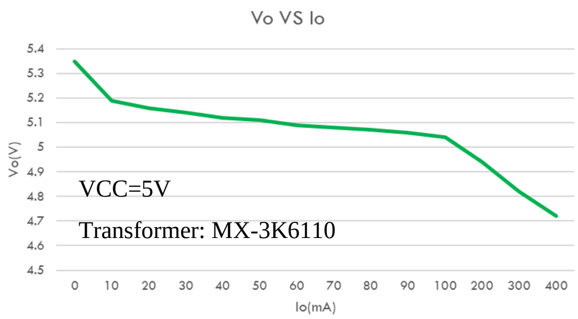
Over full range of recommended operating conditions, unless otherwise noted. All typical values are at T_A = 25°C, VCC = 5 V.

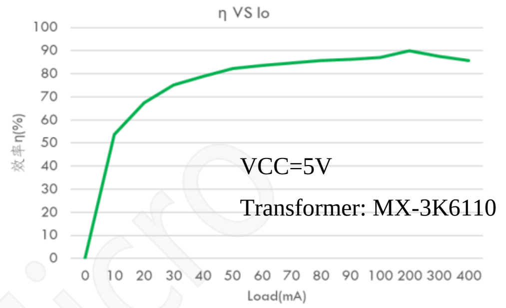
PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
VOLTAGE SUPPLY						
$I_{(vcc)}$	Supply Current (VCC = 3.3V)		0.2	1.0	1.4	mA
	Supply Current (VCC = 5V)		0.5	1.5	2.3	mA
I_{IH}	Leakage Current on EN and CLK pin	EN/CLK=V_{CC}		10	20	µA
I_{DIS}	VCC current for EN=0		0	0.4	1	µA
I_{LKG}	Leakage Current on D1,D2 for EN=0	Voltage of D1, D2 = V_{CC}		0.1		µA
$V_{CC+(UVLO)}$	Positive-going UVLO threshold			2.01	2.25	V
$V_{CC-(UVLO)}$	Negative-going UVLO threshold		1.7	1.83		V
$V_{HYS(UVLO1)}$	UVLO threshold hysteresis			0.3		V
$V_{IN(ON)}$	EN, CLK pin logic high threshold			0.4	0.7	V_{CC}
$V_{IN(OFF)}$	EN, CLK pin logic low threshold		0.2			V_{CC}
$V_{IN(HYS)}$	EN, CLK pin threshold hysteresis			0.2		V_{CC}
CLK						
F_{SW}	D1, D2 average switching Frequency	R_L = 50Ω to V_{CC}	300	420	500	kHZ
$F_{(EXT)}$	External clock frequency on CLK pin		100		2000	kHZ
OUTPUT STAGE						
DMM	Average ON time mismatch between D1 and D2	R_L = 50Ω		0%		
$R_{(ON)}$	Output switch on resistance	VCC = 3.3V, R_L = 50Ω	0.1	0.30	0.6	Ω
		VCC = 5V, R_L = 50Ω	0.1	0.35	0.7	Ω
$V_{(SLEW)}$	Voltage slew rates on D1 and D2	R_L = 50Ω to V_{CC}		82.5		V/µs
$I_{(SLEW)}$	Current slew rates at D1 and D2	R_L = 5Ω through transformer		41		A/µs
I_{LIM}	Current clamp limit (2.8V < VCC < 5.5V)		1.42	1.75	2.15	A
	Current clamp limit (2.25V < VCC < 2.8V)		0.65		1.85	A
THERMAL SHUT DOWN						
T_{SD+}	TSD turn on temperature		154	168	181	°C
T_{SD-}	TSD turn off temperature		135	150	166	°C
T_{SD-}	TSD hysteresis		13	17		°C
TIMING REQUIREMENTS						
$t_{CLKTIMER}$	Duration after which device switches to internal clock in case of invalid external clock			350		µs
T_{R_D}	D1, D2 output rise time with internal CLK	VCC = 3.3V, R_L = 50Ω		47		ns
		VCC = 5V, R_L = 50Ω		48		ns
T_{F_D}	D1, D2 output fall time	VCC = 3.3V, R_L = 50Ω		15		ns
		VCC = 5V, R_L = 50Ω		10		ns
t_{BBM}	Break-before-make time	VCC = 3.3V, R_L = 50Ω		119		ns
		VCC = 5V, R_L = 50Ω		88		ns

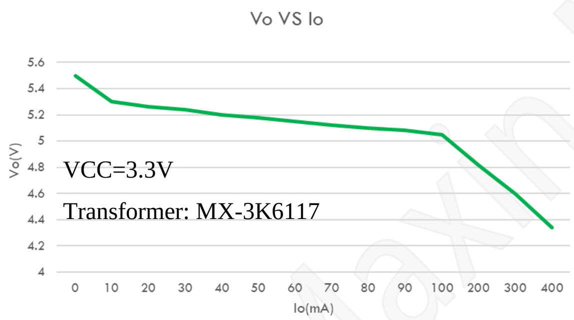
Characteristic plots

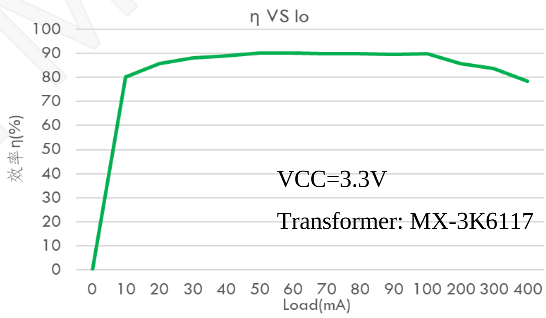


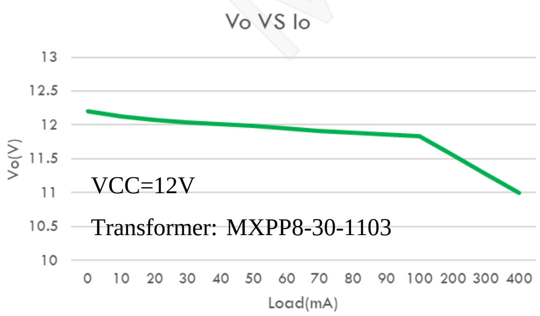


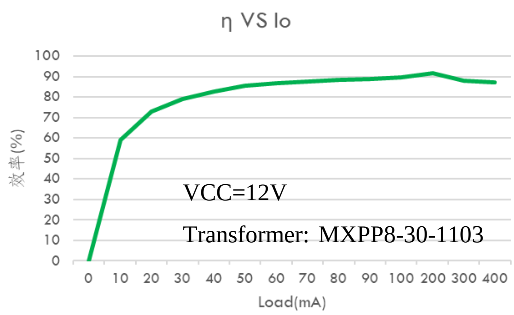


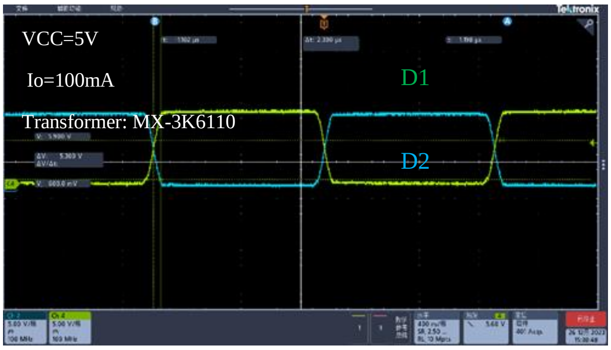




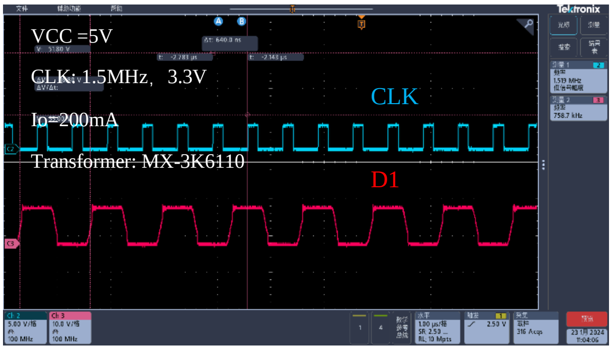




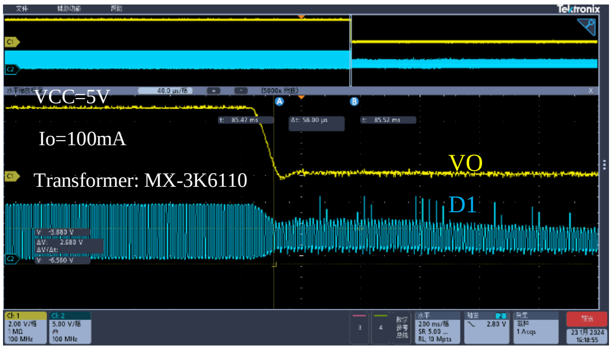




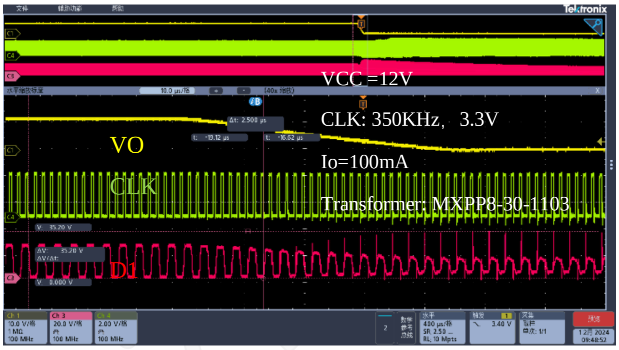
D1 and D2 during normal operation



D1 and D2 during normal operation with external CLK

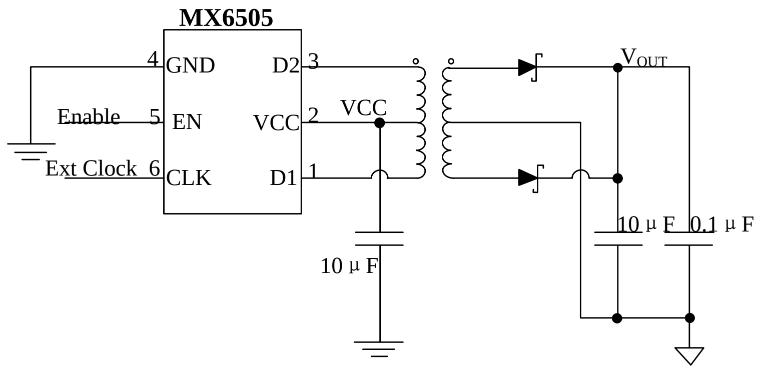


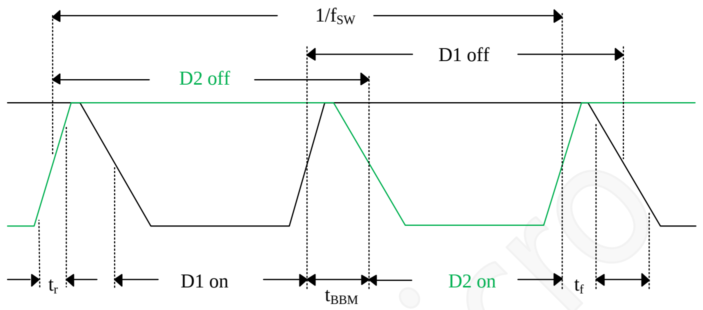
Output short circuit protection

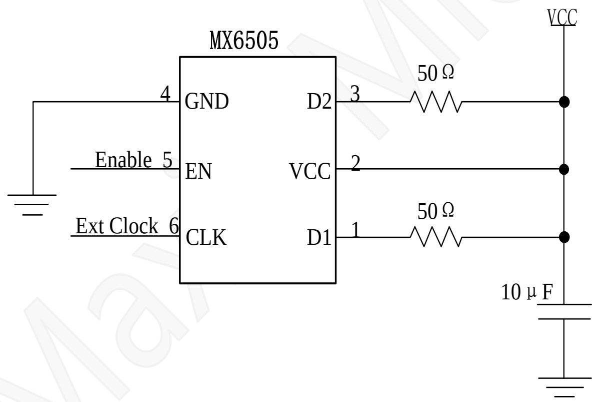


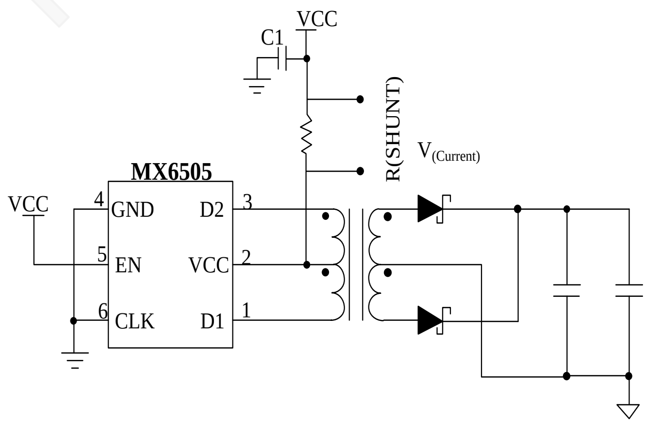
Output short circuit protection with external CLK

Parameter Measurement Information









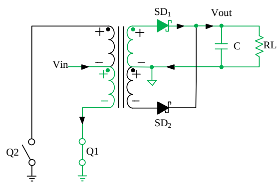
Operation description

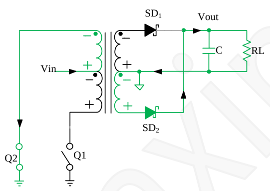
The MX6505 is a transformer driver designed for low-cost, small form-factor, isolated DC/DC converters utilizing the push-pull topology. The device includes an oscillator that feeds a gate-drive circuit. The gate-drive, comprising a frequency divider and a break-before-make (BBM) logic, provides two complementary output signals which alternately turn the two output transistors on and off.

The output frequency of the oscillator is divided down by two. A subsequent break-before-make logic inserts a dead-time between the high-pulses of the two signals. Before either one of the gates can assume logic high, the BBM logic ensures a short period during which both signals are low, and both transistors are high impedance. This short period is required to avoid shorting out both ends of the primary. The resulting output signals, present the gate-drive signals for the output transistors.

Push-pull converter

Push-pull converters require transformers with center-taps to transfer power from the primary to the secondary as the following figures.





When Q_1 conducts, V_{IN} drives a current through the lower half of the primary to ground, thus creating a negative voltage potential at the lower primary end with regards to the V_{IN} potential at the center-tap.

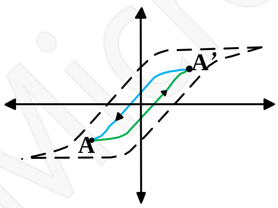
At the same time the voltage across the upper half of the primary is such that the upper primary end is positive with regards to the center-tap to maintain the previously established current flow through Q_2, which now has turned high-impedance. The two voltage sources, each of which equaling V_{IN}, appear in series and cause a voltage potential at the open end of the primary of $2\times V_{IN}$ with regards to ground.

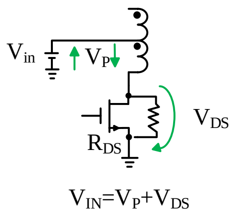
Per dot convention the same voltage polarities that occur at the primary also occur at the secondary. The positive potential of the upper secondary end therefore forward biases diode CR_1. The secondary current starting from the upper secondary end flows through CR_1, charges capacitor C, and returns through the load impedance R_L back to the center-tap.

When Q_2 conducts, Q_1 goes high-impedance and the voltage polarities at the primary and secondary reverse. Now the lower end of the primary presents the open end with a $2\times V_{IN}$ potential against ground. In this case CR_2 is forward biased while CR_1 is reverse biased and current flows from the lower secondary end through CR_2, charging the capacitor and returning through the load to the center-tap.

Core magnetization

The following figure shows the ideal magnetizing curve for a push-pull converter with B as the magnetic flux density and H as the magnetic field strength. When Q_1 conducts the magnetic flux is pushed from A to A', and when Q_2 conducts the flux is pulled back from A' to A. The difference in flux and thus in flux density is proportional to the product of the primary voltage, V_P, and the time, t_{ON}, it is applied to the primary: $B \approx V_P \times t_{ON}$





This volt-seconds (V-t) product is important as it determines the core magnetization during each switching cycle. If the V-t products of both phases are not identical, an imbalance in flux density swing results with an offset from the origin of the B-H curve. If balance is not restored, the offset increases with each following cycle and the transformer slowly creeps toward the saturation region.

Device Functional Modes

The functional modes of the device are divided into start-up, operating, and off-mode.

Start-Up Mode

When the supply voltage at V_{CC} ramps up to 2.25V, the internal oscillator starts operating. The output stage begins switching but the amplitude of the drain signals at D1 and D2 has not reached its full maximum yet.

Operating Mode

When the device supply has reached its nominal value ±10% the oscillator is fully operating. However, variations over supply voltage and operating temperature can vary the switching frequencies at D1 and D2.

Shutdown Mode

The device has a dedicated enable pin to put the device in very low power mode to save power when not in use. Enable pin has an internal pull-down resistor which keeps device disabled when not driven. When disabled or when V_{CC} is < 1.7V, both drain outputs, D1 and D2, are tri-stated.

Spread Spectrum Clocking

Radiated emissions is an important concern in high current switching power supplies. MX6505T addresses this by modulating its internal clock in such a way that the emitting energy is spread over multiple frequency bins. This Spread Spectrum clocking feature greatly improves the emissions performance of the entire power supply block and hence relieves the system designer from one major concern in isolated power supply design.

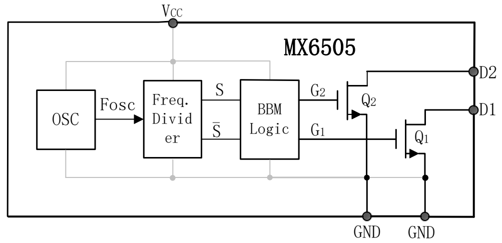
External Clock Mode

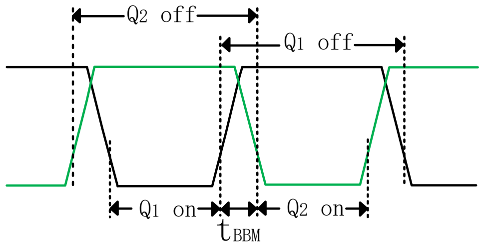
The MX6505T has a CLK pin which can be used to synchronize the device with system clock and in turn with other MX6505T devices so that the system can control the exact switching frequency of the device. The Rising edge of the CLK is used to divide a clock by two and used to drive the gates. The Application Information part gives the same sequence diagram. The device also has external clock fail safe feature which automatically switches the device to the internal clock if a valid input clock is not present for long ($t_{CLKTIMER}$). The in-built emissions reduction scheme of Spread Spectrum clocking is disabled when external clock is present.

Application and Implementation

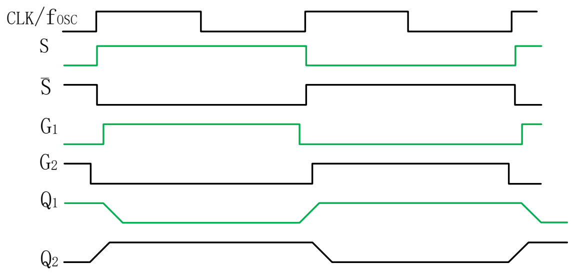
Application Information

The MX6505T is a transformer driver designed for low-cost, small form-factor, isolated DC/DC converters using the push-pull topology. The device includes an oscillator that feeds a gate-drive circuit. The gate-drive, comprising a frequency divider and a break-before-make (BBM) logic, provides two complementary output signals which alternately turn the two output transistors on and off.

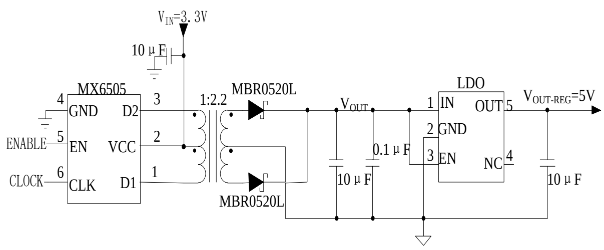




The output frequency of the oscillator is divided down by an asynchronous divider that provides two complementary output signals, S and $\overline{S}$, with a 50% duty cycle. A subsequent break-before-make logic inserts a dead-time between the high-pulses of the two signals. The resulting output signals, G_1 and G_2, present the gate-drive signals for the output transistors Q_1 and Q_2. Refer to the following figure, before either one of the gates can assume logic high, there must be a short period during which both signals are low, and both transistors are high impedance. This short period, known as break-before-make time, is required to avoid shorting out both ends of the primary.



Typical Application



Design Requirements

For this design example, the parameters listed in the following table are used as design parameters.

DESIGN PARAMETER	EXAMPLE VALUE
Input voltage range	3.3V±3%
Output voltage	5V
Maximum load current	100mA

Detailed Design Procedure

The following recommendations on components selection focus on the design of an efficient push-pull converter with high current drive capability. Contrary to popular belief, the output voltage of the unregulated converter output drops significantly over a wide range in load current. Taking the table of the characteristic curve as an example, shows that the difference between V_{OUT} at minimum load and V_{OUT} at maximum load exceeds a transceiver's supply range. Therefore, to provide a stable, load independent supply while maintaining maximum possible efficiency the implementation of a low dropout regulator (LDO) is strongly advised.

The measured V_{OUT} and efficiency characteristics for the regulated and unregulated outputs are shown in the characteristic curve.

Drive Capability

The transformer driver is designed for low-power push-pull converters with input and output voltages in the range of 2.25 V to 5.5 V. While converter designs with higher output voltages are possible, care must be taken that higher turns ratios don't lead to primary currents that exceed the specified current limits of the device.

LDO Selection

The minimum requirements for a suitable low dropout regulator are:

• Its current drive capability should slightly exceed the specified load current of the application to prevent the LDO from dropping out of regulation. Therefore, for a load current of 600mA, choose a 600mA to 750mA LDO. While regulators with higher drive capabilities are acceptable, they also usually possess higher dropout voltages that will reduce overall converter efficiency.

• The internal dropout voltage, V_{DO}, at the specified load current should be as low as possible to maintain efficiency. For a low-cost 750mA LDO, a V_{DO} of 600mV at 750mA is common. Be aware; however, that this lower value is usually specified at room temperature and can increase by a factor of 2 over temperature, which in turn will raise the required minimum input voltage.

• The required minimum input voltage preventing the regulator from dropping out of line regulation is given with:

$$V_{I-min} = V_{DO-max} + V_{O-max}$$

This means to determine V_I for worst-case condition, the user must take the maximum values for V_{DO} and V_O specified in the LDO data sheet for rated output current (that is, 600mA) and add them together. Also specify that the output voltage of the push-pull rectifier at the specified load current is equal or higher than V_{I-min}. If it is not, the LDO will lose line-regulation and any variations at the input passes straight through to the output. Hence, below V_{I-min} the output voltage follows the input, and the regulator behaves like a simple conductor.

• The maximum regulator input voltage must be higher than the rectifier output under no-load. Under this condition there is no secondary current reflected to the primary, thus making the voltage drop across R_{DS-on} negligible and allowing the entire converter input voltage to drop across the primary. At this point, the secondary reaches its maximum voltage of

$$V_{S-max} = V_{IN-max} \times n$$

with V_{IN-max} as the maximum converter input voltage and n as the transformer turns ratio. Thus, to prevent the LDO from damage the maximum regulator input voltage must be higher than V_{S-max}.

Diode Selection

A rectifier diode should always possess low-forward voltage to provide as much voltage to the converter output as possible. When used in high frequency switching applications, such as the MX6505T however, the diode must also possess a short recovery time. Schottky diodes meet both requirements and are therefore strongly recommended in push-pull converter designs. A good choice for low-volt applications and ambient temperatures of up to 85°C is the low-cost Schottky rectifier MBR0520L with a typical forward voltage of 275 mV at 100-mA forward current. For higher output voltages such as ±10V and above use the MBR0530 which provides a higher DC blocking voltage of 30V.

Lab measurements have shown that at temperatures higher than 100°C the leakage currents of the above Schottky diodes increase significantly. This can cause thermal runaway leading to the collapse of the rectifier output voltage. Therefore, for ambient temperatures higher than 85°C use low-leakage Schottky diodes.

Capacitor Selection

It is recommended that the capacitor in the converter circuit in the transformer part is a multi-layer ceramic chip (MLCC) capacitor.

As with all high-speed CMOS ICs, the device requires a bypass capacitor in the range of 10nF to 100nF.

The input bulk capacitor at the center-tap of the primary supports large currents into the primary during the fast-switching transients. For minimum ripple make this capacitor 1µF to 10µF. In a 2-layer PCB design with a dedicated ground plane, place this capacitor close to the primary center-tap to minimize trace inductance. In a 4-layer board design with low-inductance reference planes for ground and V_{IN}, the capacitor can be placed at the supply entrance of the board. To ensure low-inductance paths use two vias in parallel for each connection to a reference plane or to the primary center-tap.

The bulk capacitor at the rectifier output smooths the output voltage. Make this capacitor 1µF to 10µF.

The small capacitor at the regulator input is not necessarily required. However, good analog design practice suggests, using a small value of 47nF to 100nF improves the regulator's transient response and noise rejection.

The LDO output capacitor buffers the regulated output for the subsequent isolator and transceiver circuitry. The choice of output capacitor depends on the LDO stability requirements specified in the data sheet. However, in most cases, a low-ESR ceramic capacitor in the range of 4.7µF to 10µF will satisfy these requirements.

Transformer Selection

V-t Product Calculation

To prevent a transformer from saturation its V-t product must be greater than the maximum V-t product applied by the device. The maximum voltage delivered by the device is the nominal converter input plus 10%. The maximum time this voltage is applied to the primary is half the period of the lowest frequency at the specified input voltage. Therefore, the transformer's minimum V-t product is determined through:

$$Vt_{min} \geq V_{IN-max} \times \frac{T_{max}}{2} = \frac{V_{IN-max}}{2 \times f_{min}}$$

Taking an example of f_{min} as 363kHZ for MX6505T with a 5V supply, the minimum value of V-t product is given by the above formula:

$$Vt_{min} \geq \frac{5.5V}{2 \times 363kHZ} = 7.6V\mu s$$

Common V-t values for low-power center-tapped transformers range from 22Vµs to 150Vµs with typical footprints of 10 mm × 12 mm. However, transformers specifically designed for PCMCIA applications provide as little as 11Vµs and come with a significantly reduced footprint of 6mm × 6mm only.

While Vt-wise all these transformers can be driven by the device, other important factors such as isolation voltage, transformer wattage, and turns ratio must be considered before making the final decision.

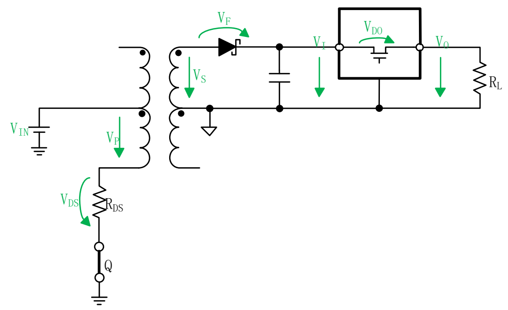
Turns Ratio Estimate

Assume the rectifier diodes and linear regulator has been selected. Also, it has been determined that the transformer chosen must have a V-t product of at least 11Vµs. However, before searching the manufacturer web sites for a suitable transformer, the user still needs to know its minimum turns ratio that allows the push-pull converter to operate flawlessly over the specified current and temperature range. This minimum transformation ratio is expressed through the ratio of minimum secondary to minimum primary voltage multiplied by a correction factor that takes the transformer's typical efficiency of 97% into account:

$$V_{P-min} = V_{IN-min} - V_{DS-max}$$

V_{S-min} must be large enough to allow for a maximum voltage drop, V_{F-max}, across the rectifier diode and still provide sufficient input voltage for the regulator to remain in regulation. From the LDO selection section, this minimum input voltage is known and by adding V_{F-max} gives the minimum secondary voltage with:

$$V_{S-min} = V_{F-max} + V_{DO-max} + V_{O-max}$$



Then calculating the available minimum primary voltage, V_{P-min}, involves subtracting the maximum possible drain-source voltage of the device, V_{DS-max}, from the minimum converter input voltage V_{IN-min}:

$$V_{P-min} = V_{IN-min} - V_{DS-max}$$

$V_{DS\text{-}max}$ however, is the product of the maximum $R_{DS(on)}$ and I_D values for a given supply specified in the data sheet:

$$V_{DS-max} = R_{DS-max} \times I_{Dmax}$$

Then the equation of $V_{DS\text{-}MAX}$ is inserted into the equation of $V_{P\text{-}min}$, and the following equation is obtained.

$$V_{P-min} = V_{IN-min} - R_{DS-max} \times I_{Dmax}$$

and inserting the above equation and the equation about $V_{S\text{-}min}$ in the upper most equation about $V_{P\text{-}min}$ provides the minimum turns ration with:

$$n_{min} = 1.031 \times \frac{V_{F-max} + V_{DO-max} + V_{o-max}}{V_{IN-min} - R_{DS-max} \times I_{D-max}}$$

Example:

For a 3.3 V_{IN} to 5 V_{OUT} converter using the rectifier diode MBR0520L and the 5V LDO, the data sheet values taken for a load current of 600 and a maximum temperature of 85°C are $V_{F\text{-}max}$ = 0.2V,

$V_{DO\text{-}max}$ = 0.5V, and $V_{O\text{-}max}$ = 5.1V.

Then assuming that the converter input voltage is taken from a 3.3V controller supply with a maximum ±2% accuracy makes VIN-min = 3.234V. Finally, the maximum values for drain-source resistance and drain current at 3.3V are taken from the data sheet with $R_{DS\text{-}max}$ = 0.31Ω and $I_{D\text{-}max}$ = 1A.

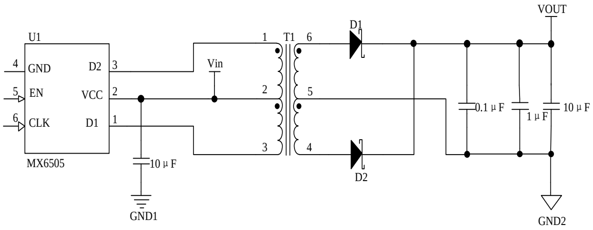
Inserting the values above into the formula of n_{min} yields a minimum turns ratio of:

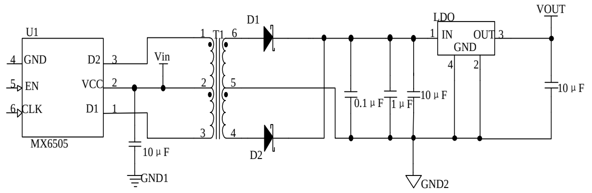
$$n_{min} = 1.031 \times \frac{0.2V + 0.5V + 5.1V}{3.234V - 0.31\Omega \times 1A} = 2.05$$

Most commercially available transformers for 3V-to-5V push-pull converters offer turns ratios between 2.0 and 2.3 with a common tolerance of ±3%.

Recommended Transformers

Depending on the application, use the minimum or standard configuration in the figure below.





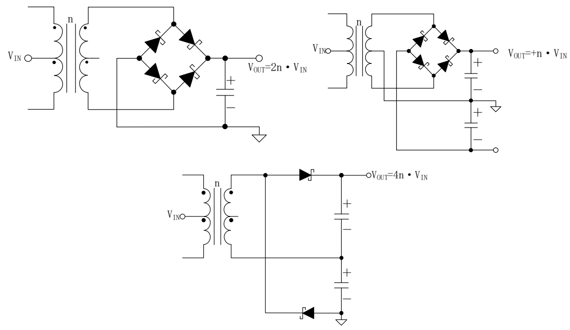
Application Curves

See the Characteristic plots for application curves with transformers optimized for the device, providing high efficiency and small form factor at low-cost.

System Examples

Higher Output Voltage Designs

The device can drive push-pull converters that provide high output voltages of up to 30V, or bipolar outputs of up to ±15V. Using commercially available center-tapped transformers, with their rather low turns ratios of 0.8 to 5, requires different rectifier topologies to achieve high output voltages. Some of these topologies and their respective open-circuit output voltages are shown in the figure below.



Application Circuits

The following application circuits are shown for a 3.3V input supply commonly taken from the local, regulated microcontroller supply.

Power Supply Recommendations

The device is designed to operate from an input voltage supply range between 2.5V and 5V nominal. This input supply must be regulated within ±10%. If the input supply is located more than a few inches from the device, a 0.1μF by-pass capacitor should be connected as close as possible to the device V_{CC} pin and a 10μF capacitor should be connected close to the transformer center-tap pin.

Layout Guidelines

• The V_{IN} pin must be buffered to ground with a low-ESR ceramic bypass-capacitor. The recommended capacitor value can range from 1μF to 10μF. The capacitor must have a voltage rating of 10V minimum and a X5R or X7R dielectric.

• The optimum placement is closest to the V_{IN} and GND pins at the board entrance to minimize the loop area formed by the bypass-capacitor connection, the V_{IN} terminal, and the GND pin.

• The connections between the device D1 and D2 pins and the transformer primary endings, and the connection of the device V_{CC} pin and the transformer center-tap must be as close as possible for minimum trace inductance.

• The connection of the device V_{CC} pin and the transformer center-tap must be buffered to ground with a low-ESR ceramic bypass-capacitor. The recommended capacitor value can range from 1μF to 10μF. The capacitor must have a voltage rating of 16V minimum and a X5R or X7R dielectric.

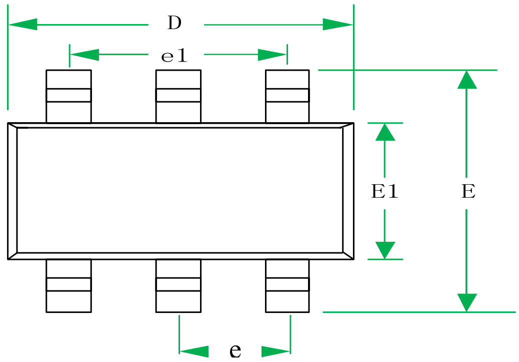
• The device GND pins must be tied to the PCB ground plane using two vias for minimum inductance.

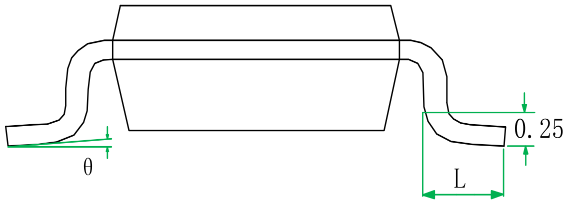
• The ground connections of the capacitors and the ground plane should use two vias for minimum inductance.

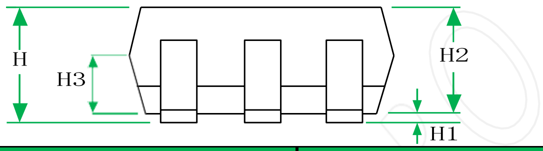
• The rectifier diodes should be Schottky diodes with low forward voltage in the 10mA to 100mA current range to maximize efficiency.

• The V_{OUT} pin must be buffered to ISO-Ground with a low-ESR ceramic bypass-capacitor. The recommended capacitor value can range from 1μF to 10μF. The capacitor must have a voltage rating of 16V minimum and a X5R or X7R dielectric.

Package information







编号	单位（毫米）			单位（英寸）		
	最小值	典型值	最大值	最小值	典型值	最大值
H			1.45			0.057
H1	0.04		0.15	0.0016		0.0059
H2	1.00	1.10	1.20	0.039	0.043	0.047
H3	0.55	0.65	0.75	0.022	0.026	0.029
D	2.72	2.92	3.12	0.107	0.115	0.123
E	2.60	2.80	3.00	0.102	0.110	0.118
E1	1.40	1.60	1.80	0.055	0.063	0.071
e	0.95BSC			0.037BSC		
e1	1.90BSC			0.074BSC		
L	0.30		0.60	0.012		0.024
θ	0		8°	0		8°

SOT23-6 for MX6505T

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