# Dual, High Voltage, Isolated MOSFET Driver

#### **Features**

- ▶ ±400V input to output isolation
- ▶ ±700V isolation between outputs
- ► No external voltage supply required
- Dual isolated output drivers
- Option of internal or external clock

#### **Applications**

- ▶ Telecommunications
- ▶ Modems
- Solid state relays
- ► High side switches
- ► High end audio switches
- Avionics
- ► ATE

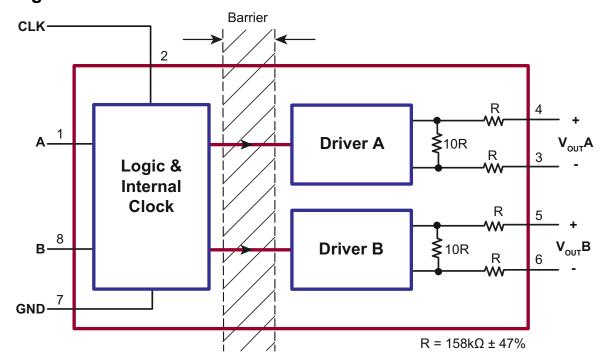
#### **General Description**

The Supertex HT0440 is a dual, high voltage, isolated MOSFET driver utilizing Supertex's proprietary HVCMOS® technology. It is designed to drive discrete MOSFETs configured as bidirectional or unidirectional switches. It can drive N-channel MOSFETs as high-side switches up to 400V. The HT0440 generates two independent DC isolated voltages to the outputs, V<sub>OUT</sub>A and V<sub>OUT</sub>B when logic inputs A and B are at logic high.

The internal clock of the HT0440 can be disabled by applying an external clock signal to the CLK pin. This allows the power dissipation and AC characteristics to be tailored to meet specific needs. The CLK pin should be connected to ground when not in use. The HT0440 does not require any external power supplies, the internal supply voltage is supplied by either of the two logic inputs, A or B, when they are at logic high.

For detailed circuit application information, please refer to application note AN-D26.

### **Block Diagram**



### **Ordering Information**

Part Number	Package Options	Packing
HT0440K6-G	10-Lead (3x4) DFN	3000/Reel
HT0440LG-G	8-Lead SOIC (Narrow Body)	2500/Reel

<sup>-</sup>G denotes a lead (Pb)-free / RoHS compliant package

### **Absolute Maximum Ratings**

Parameter	Value
Input to output isolation voltage, $V_{\rm ISO}$	±400V
Logic input voltage, $V_A$ , $V_B$	-0.5 to +7.0V
Maximum junction temperature	+125°C
Storage temperature	-55°C to +150°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied. Continuous operation of the device at the absolute rating level may affect device reliability. All voltages are referenced to device ground.

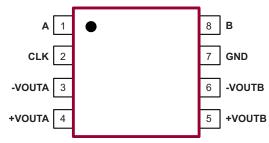
### **Typical Thermal Resistance**

Package	$ heta_{ja}$
10-Lead DFN	40°C/W
8-Lead SOIC (Narrow Body)	101°C/W

#### **Pin Configurations**

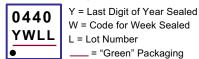


10-Lead DFN (top view)



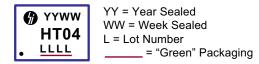
8-Lead SOIC (Narrow Body) (top view)

### **Product Marking**



Package may or may not include the following marks: Si or 🎲

#### 10-Lead DFN



Package may or may not include the following marks: Si or

8-Lead SOIC (Narrow Body

### **Recommended Operating Conditions**

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Sym	Parameter	Min	Тур	Max	Units	Conditions							
CLK	External clock frequency	0.5	-	2.0	MHz								
V <sub>IHCLK</sub>	Clock input high voltage	3.15	-	5.5	V								
V <sub>ILCLK</sub>	Clock input low voltage	0	-	0.5	V								
V <sub>IH</sub>	Logic input high voltage	3.15	-	5.5	V								
V <sub>IL</sub>	Logic input low voltage	0	-	0.5	V								
T <sub>A</sub>	Operating temperature	-40	-	+85	οС								

### DC Electrical Characteristics (T<sub>A</sub> = 25°C unless otherwise specified)

Sym	Parameter	Min	Тур	Max	Units	Conditions
		-	-	300	μA	$V_A = 3.5V, V_B = 3.5V, CLK = 0V$
		-	-	500	μA	$V_A = 3.5V, V_B = 3.5V, CLK = 500kHz$
I <sub>HA</sub> + I <sub>HB</sub>	Total logic high input current	_	-	2.0	mA	$V_A = 3.5V, V_B = 3.5V, CLK = 2.0MHz$
		-	-	1.0	mA	$V_A = 5.5V, V_B = 5.5V, CLK = 0V$
		_	-	2.0	mA	$V_A = 5.5V, V_B = 5.5V, CLK = 500kHz$
		6.0	-	-	V	$V_A = 3.15V, V_B = 3.15V,$ CLK = 0V, no load
		5.0	-	-	V	$V_A = 3.15V, V_B = 3.15V,$ CLK = 500kHz, no load
V <sub>OUTA</sub> , V <sub>OUTB</sub>	Output voltage	6.0	-	-	V	$V_A = 3.15V, V_B = 3.15V,$ CLK = 2.0MHz, no load
		10.0	-	-	V	$V_A = 4.5V$ , $V_B = 4.5V$ , CLK = 0V, no load
		8.0	-	-	V	$V_A = 4.5V$ , $V_B = 4.5V$ , CLK = 500KHz, no load
I <sub>ILA</sub>	Logic low input A current	ı	-	10	μA	$V_A = 0.5V, V_B = high$
I <sub>ILB</sub>	Logic low input B current	-	-	10	μA	$V_A = high, V_B = 0.5V$
I <sub>ILQ</sub>	Quiescent current	-	-	10	μA	$V_A = 0.5V, V_B = 0.5V$
V <sub>ISO</sub>	Input to output isolation voltage	±400	-	-	V	
V <sub>CISO</sub>	Output to output isolation voltage	±700	-	-	V	

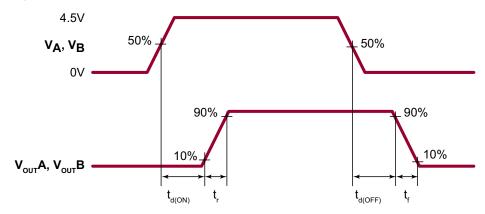
# AC Electrical Characteristics (T<sub>A</sub> = 25°C unless otherwise specified)

Sym	Parameter Min Typ Max Units C		Conditions			
t <sub>d(ON)</sub>	Turn-ON delay time	-	-	50	μs	
t,	Rise time	-	-	650	μs	See timing diagram and test circuit
t <sub>d(OFF)</sub>	Turn-OFF delay time	-	-	150	μs	CLK = 0V, CL = 600pF
t,	Fall time	-	-	3.0	ms	

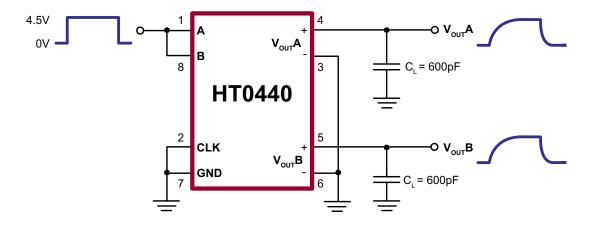
### **Truth Table**

Α	В	CLK	<b>V</b> <sub>out</sub> <b>A</b>	V <sub>out</sub> B	Internal Clock
0	0	0	OFF	OFF	OFF
0		0	OFF	ON	ON
	0	0	ON	OFF	ON
1	1	0	ON	ON	ON
0	0	CLK	OFF	OFF	OFF
0		CLK	OFF	ON	OFF
	0	CLK	ON	OFF	OFF
1	1	CLK	ON	ON	OFF

### **Timing Diagram**

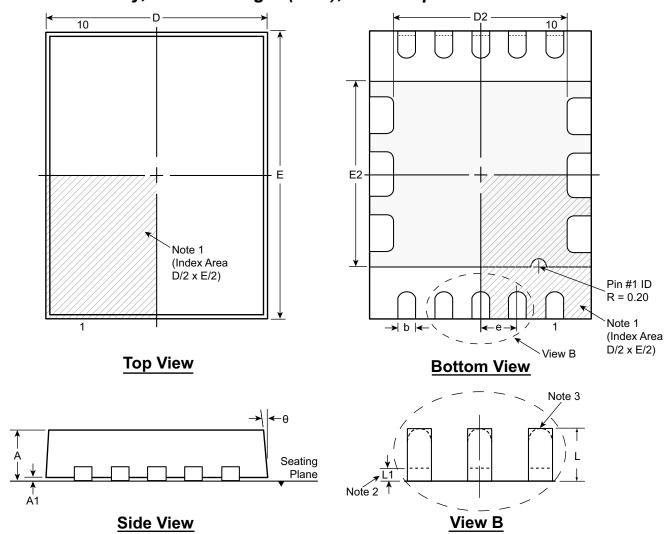


### **Test Circuit**



# 10-Lead DFN Package Outline (K6)

### 3.00x4.00mm body, 1.00mm height (max), 0.50mm pitch



#### Notes:

- 1. A Pin 1 identifier must be located in the index area indicated. The Pin 1 identifier can be: a molded mark/identifier; an embedded metal marker; or a printed indicator.
- 2. Depending on the method of manufacturing, a maximum of 0.15mm pullback (L1) may be present.
- 3. The inner tip of the lead may be either rounded or square.

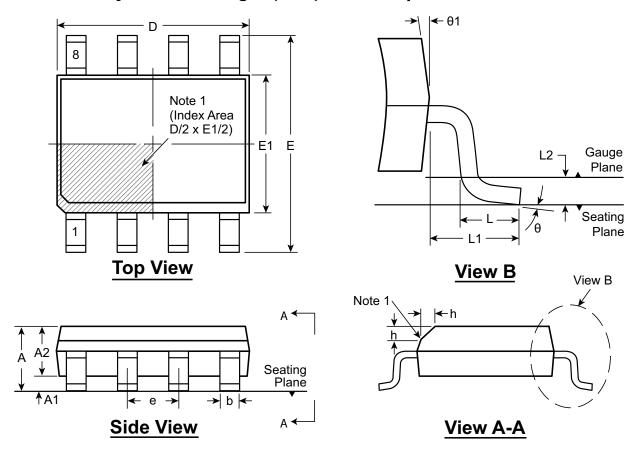
Symb	ol	Α	A1	b	D	D2	E	E2	е	L	L1	θ
<u> </u>	MIN	0.80	0.00	0.18	2.95	2.20	3.95	2.50	0.50	0.30	0.00	<b>0</b> °
Dimension (mm)	NOM	0.90	0.02	0.25	3.00	2.35	4.00	2.65	0.50 BSC	0.40	-	-
(mm)	MAX	1.00	0.05	0.30	3.05	2.45	4.05	2.75	ВОО	0.50	0.15	14°

Drawings not to scale.

Supertex Doc. #: DSPD-10DFNK63X4P050, Version A072611

## 8-Lead SOIC (Narrow Body) Package Outline (LG)

4.90x3.90mm body, 1.75mm height (max), 1.27mm pitch



#### Note:

1. This chamfer feature is optional. A Pin 1 identifier must be located in the index area indicated. The Pin 1 identifier can be: a molded mark/identifier; an embedded metal marker; or a printed indicator.

Symbo	l	Α	<b>A</b> 1	A2	b	D	E	E1	е	h	L	L1	L2	θ	θ1
Dimension (mm)	MIN	1.35*	0.10	1.25	0.31	4.80*	5.80*	3.80*		0.25	0.40			<b>0</b> °	<b>5</b> °
	NOM	-	-	-	-	4.90	6.00	3.90	1.27 BSC	-	-	1.04 REF	0.25 BSC	-	-
	MAX	1.75	0.25	1.65*	0.51	5.00*	6.20*	4.00*		0.50	1.27			<b>8</b> º	15°

JEDEC Registration MS-012, Variation AA, Issue E, Sept. 2005.

Drawings are not to scale.

Supertex Doc. #: DSPD-8SOLGTG, Version 1041309.

(The package drawing(s) in this data sheet may not reflect the most current specifications. For the latest package outline information go to <a href="http://www.supertex.com/packaging.html">http://www.supertex.com/packaging.html</a>.)

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<sup>\*</sup> This dimension is not specified in the JEDEC drawing.