

Features

- 4A Peak Source/Sink Drive Current
- Wide Operating Voltage Range: 4.5V to 35V
- -55°C to +125°C Extended Operating Temperature Range
- Logic Input Withstands Negative Swing of up to 5V
- Matched Rise and Fall Times
- Low Propagation Delay Time: 19ns
- Low, 10 μ A Supply Current
- Low Output Impedance

Applications

- Efficient Power MOSFET and IGBT Switching
- Switch Mode Power Supplies
- Motor Controls
- DC to DC Converters
- Class-D Switching Amplifiers
- Pulse Transformer Driver



Description

The IXDD604/IXDF604/IXDI604/IXDN604 dual high-speed gate drivers are especially well suited for driving the latest IXYS MOSFETs and IGBTs. Each of the two outputs can source and sink 4A of peak current while producing voltage rise and fall times of less than 10ns. The input of each driver is TTL and CMOS compatible, and is virtually immune to latch up. Proprietary circuitry eliminates cross conduction and current “shoot-through.” Low propagation delay and fast, matched rise and fall times make the IXDD604/IXDF604/IXDI604/IXDN604 ideal for high-frequency and high-power applications.

The IXDD604 is configured as a dual non-inverting driver with an enable. The IXDN is configured as a dual non-inverting driver, the IXDI is configured as a dual inverting driver, and the IXDF is configured as a dual inverting + non-inverting driver.

The IXDD604/IXDF604/IXDI604/IXDN604 family is available in a standard 8-pin DIP (PI), 8-lead SOIC (SIA), 8-lead SOIC with an exposed grounded metal back (SI), and an 8-lead DFN (D2) package.

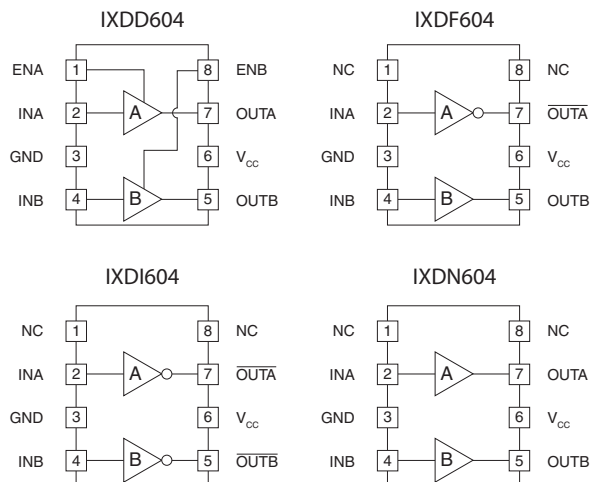
Ordering Information

Part Number	Logic Configuration	Package Type	Packing Method	Quantity
IXDD604D2T/R		8-Lead DFN	Tape & Reel	2500
IXDD604PI		8-Pin DIP	Tube	50
IXDD604SI		8-Lead SOIC with Exposed, Grounded Metal Back	Tube	94
IXDD604SIA		8-Lead SOIC	Tube	94
IXDD604SIAT/R		8-Lead SOIC	Tape & Reel	2500
IXDF604PI		8-Pin DIP	Tube	50
IXDF604SI		8-Lead SOIC with Exposed, Grounded Metal Back	Tube	94
IXDF604SIA		8-Lead SOIC	Tube	94
IXDF604SIAT/R		8-Lead SOIC	Tape & Reel	2500
IXDI604PI		8-Pin DIP	Tube	50
IXDI604SI		8-Lead SOIC with Exposed, Grounded Metal Back	Tube	94
IXDI604SIA		8-Lead SOIC	Tube	94
IXDI604SIAT/R		8-Lead SOIC	Tape & Reel	2500
IXDN604PI		8-Pin DIP	Tube	50
IXDN604SI		8-Lead SOIC with Exposed, Grounded Metal Back	Tube	94
IXDN604SIA		8-Lead SOIC	Tube	94
IXDN604SIAT/R		8-Lead SOIC	Tape & Reel	2500

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1 Specifications

1.1 Pin Configurations



1.2 Pin Definitions

Pin Name	Description
INA	Channel A Logic Input
INB	Channel B Logic Input
ENA	Channel A Enable Input - Drive pin low to disable Channel A and force Channel A Output to a high impedance state
ENB	Channel B Enable Input - Drive pin low to disable Channel A and force Channel A Output to a high impedance state
<u>OUTA</u> OUTA	Channel A Output -Sources or sinks current to turn-on or turn-off a discrete MOSFET or IGBT
<u>OUTB</u> OUTB	Channel B Output -Sources or sinks current to turn-on or turn-off a discrete MOSFET or IGBT
V _{CC}	Supply Voltage - Provides power to the device
GND	Ground - Common ground reference for the device

1.3 Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Units
Supply Voltage	V _{CC}	-	40	V
All Other Pins	-	-0.3	V _{CC} +0.3	V
Output Current		-	±4	A
Junction Temperature	T _J	-55	+150	°C
Storage Temperature	T _{STG}	-65	+150	°C

Absolute maximum electrical ratings are at 25°C

Absolute maximum ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at conditions beyond those indicated in the operational sections of this data sheet is not implied.

1.4 Recommended Operating Conditions

Parameter	Symbol	Minimum	Maximum	Units
Supply Voltage	V _{CC}	4.5	35	V
Operating Temperature Range	T _A	-40	+125	°C

1.5 Electrical Characteristics

Test Conditions: $T_A=25^{\circ}\text{C}$, $4.5\text{V} \leq V_{CC} \leq 35\text{V}$, one channel (unless otherwise noted).

Parameter	Conditions	Symbol	Minimum	Typical	Maximum	Units
Input Voltage, High	$4.5\text{V} \leq V_{CC} \leq 18\text{V}$	V_{IH}	2.4	-	-	V
Input Voltage, Low	$4.5\text{V} \leq V_{CC} \leq 18\text{V}$	V_{IL}	-	-	0.8	
Input Voltage Range	-	V_{IN}	-5	-	$V_{CC}+0.3$	
Input Current	$0\text{V} \leq V_{IN} \leq V_{CC}$	I_{IN}	-10	-	10	μA
High EN Input Voltage	IXDD604 only	V_{ENH}	$2/3V_{CC}$	-	-	V
Low EN Input Voltage	IXDD604 only	V_{ENL}	-	-	$1/3V_{CC}$	
Output Voltage, High	-	V_{OH}	$V_{CC}-0.025$	-	-	V
Output Voltage, Low	-	V_{OL}	-	-	0.025	
Output Resistance, High State	$V_{CC}=18\text{V}$, $I_{OUT}=-10\text{mA}$	R_{OH}	-	1.5	2.5	Ω
Output Resistance, Low State	$V_{CC}=18\text{V}$, $I_{OUT}=10\text{mA}$	R_{OL}	-	1.2	2	
Output Current, Continuous	Limited by package power dissipation	I_{DC}	-	-	± 1	A
Rise Time	$C_{LOAD}=1000\text{pF}$, $V_{CC}=18\text{V}$	t_R	-	9	16	ns
Fall Time	$C_{LOAD}=1000\text{pF}$, $V_{CC}=18\text{V}$	t_F	-	8	14	
On-Time Propagation Delay	$C_{LOAD}=1000\text{pF}$, $V_{CC}=18\text{V}$	t_{ONDLY}	-	19	40	
Off-Time Propagation Delay	$C_{LOAD}=1000\text{pF}$, $V_{CC}=18\text{V}$	t_{OFFDLY}	-	18	35	
Enable to Output-High Delay Time	IXDD604 only	t_{ENOH}	-	15	30	
Disable to High Impedance State Delay Time	IXDD604 only	t_{DOLD}	-	-	30	
Enable Pull-Up Resistor	-	R_{EN}	-	200	-	$\text{k}\Omega$
Power Supply Current	$V_{CC}=18\text{V}$, $V_{IN}=3.5\text{V}$	I_{CC}	-	1	3	mA
	$V_{CC}=18\text{V}$, $V_{IN}=0\text{V}$		-	-	10	μA
	$V_{CC}=18\text{V}$, $V_{IN}=V_{CC}$		-	-	10	

1.6 Electrical Characteristics

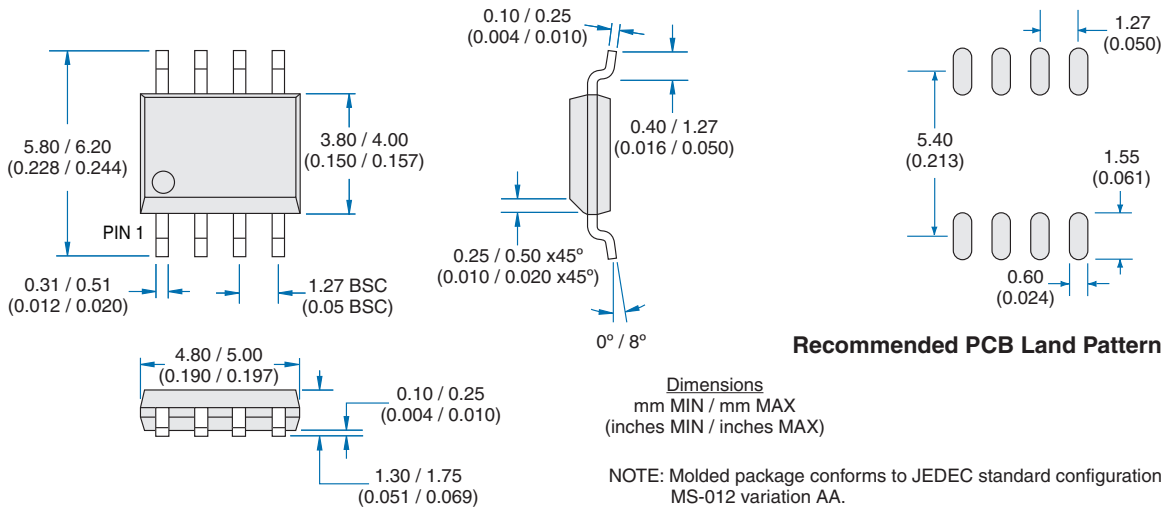
Test Conditions: $T_A = -40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$, $4.5\text{V} \leq V_{CC} \leq 35\text{V}$, $T_J < 150^{\circ}\text{C}$, one channel (unless otherwise noted).

Parameter	Conditions	Symbol	Minimum	Typical	Maximum	Units
Input Voltage, High	$4.5\text{V} \leq V_{CC} \leq 18\text{V}$	V_{IH}	2.4	-	-	V
Input Voltage, Low	$4.5\text{V} \leq V_{CC} \leq 18\text{V}$	V_{IL}	-	-	0.8	
Input Voltage Range	-	V_{IN}	-5	-	$V_{CC}+0.3$	
Input Current	$0\text{V} \leq V_{IN} \leq V_{CC}$	I_{IN}	-10	-	10	μA
Output Voltage, High	-	V_{OH}	$V_{CC}-0.025$	-	-	V
Output Voltage, Low	-	V_{OL}	-	-	0.025	
Output Resistance, High State	$V_{CC}=18\text{V}$, $I_{OUT}=-10\text{mA}$	R_{OH}	-	-	3	Ω
Output Resistance, Low State	$V_{CC}=18\text{V}$, $I_{OUT}=10\text{mA}$	R_{OL}	-	-	2	
Output Current, Continuous	Limited by package power dissipation	I_{DC}	-	-	± 1	A
Rise Time	$C_{LOAD}=1000\text{pF}$, $V_{CC}=18\text{V}$	t_R	-	-	10	ns
Fall Time	$C_{LOAD}=1000\text{pF}$, $V_{CC}=18\text{V}$	t_F	-	-	9	
On-Time Propagation Delay	$C_{LOAD}=1000\text{pF}$, $V_{CC}=18\text{V}$	t_{ONDLY}	-	-	23	
Off-Time Propagation Delay	$C_{LOAD}=1000\text{pF}$, $V_{CC}=18\text{V}$	t_{OFFDLY}	-	-	32	
Enable to Output-High Delay Time	IXDD604 only	t_{ENOH}	-	-	60	
Disable to High Impedance State Delay Time	IXDD604 only	t_{DOLD}	-	-	59	
Power Supply Current	$V_{CC}=18\text{V}$, $V_{IN}=3.5\text{V}$	I_{CC}	-	1	3	mA
	$V_{CC}=18\text{V}$, $V_{IN}=0\text{V}$		-	-	10	μA
	$V_{CC}=18\text{V}$, $V_{IN}=V_{CC}$		-	-	10	

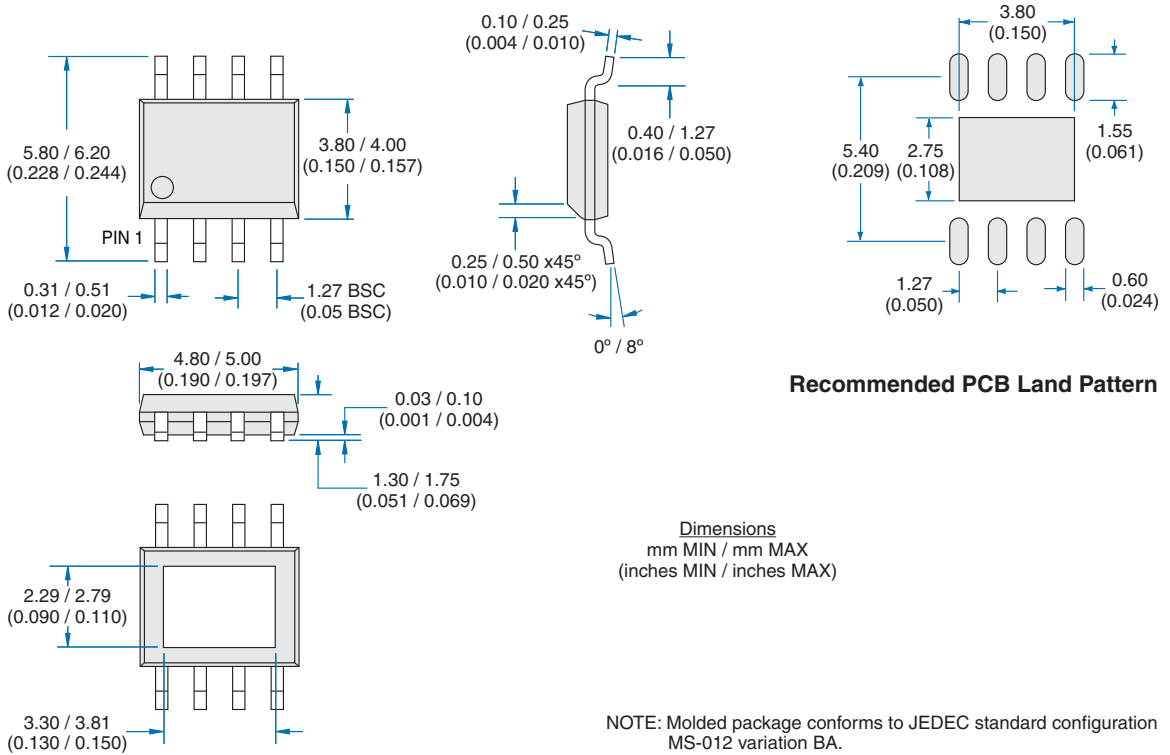
2 Manufacturing Information

2.1 Mechanical Dimensions

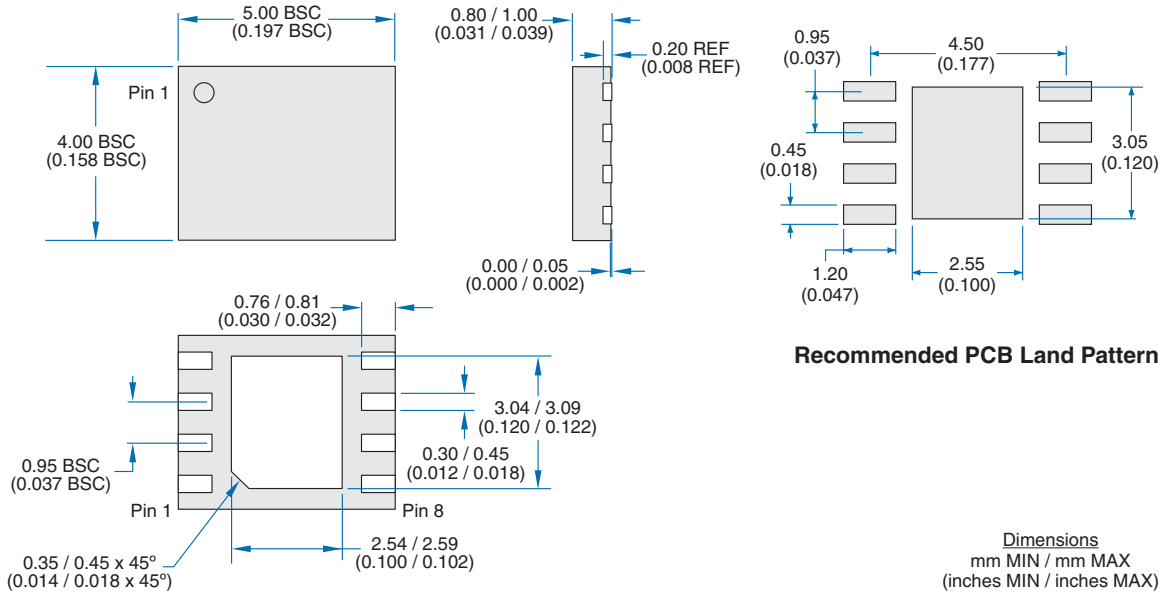
2.1.1 8-Pin SOIC - SIA Package



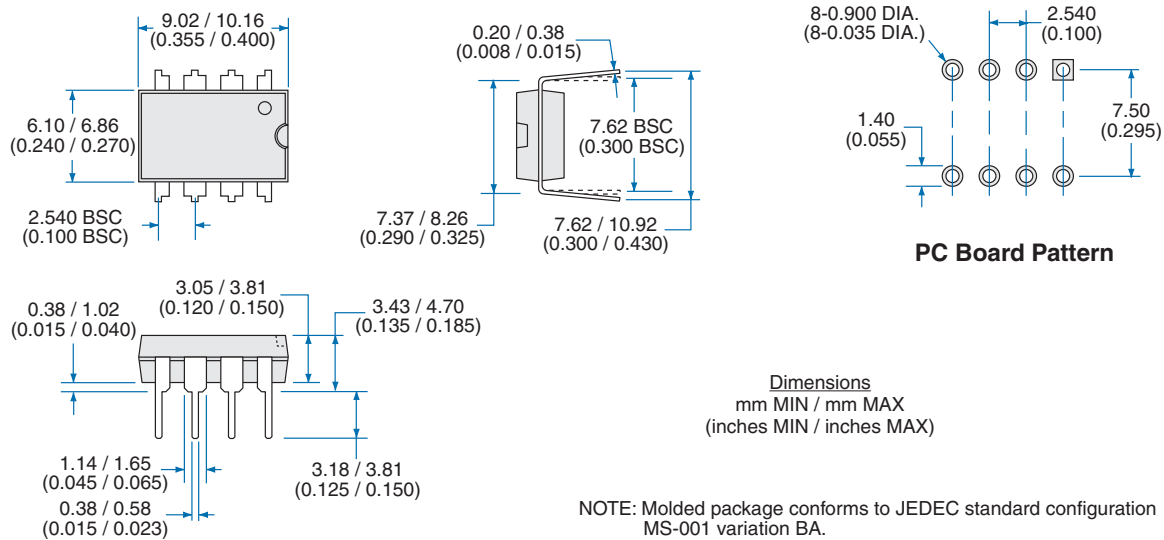
2.1.2 8-Pin SOIC - SI Package



2.1.3 8-Pin DFN - D2 Package



2.1.4 8-Pin DIP - PI Package



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