High Speed Single Low Side Driver

FEATURES

- **Output in Phase with Input**
- **Compatible with 3.3V and 5V Logic Input**
- **Input Voltages up to V_S**
- **Under Voltage Lockout**
- **Additional OUT Pin**
- **Short Delay Time: 50ns at V_S = 15V**
- **Output Rise and Fall Time of 25ns with 1000pF Load at V_S = 15V**
- **Low Supply Current: 60μA at V_S = 15V**
- **Leadfree, RoHS Compliant**

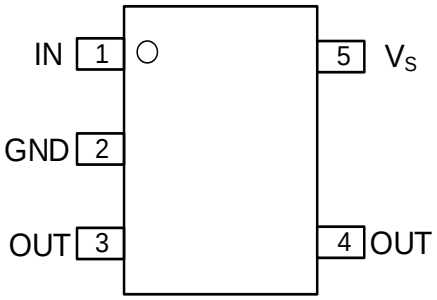
APPLICATIONS

- **Switching Mode Power Supplies**
- **Motor Drivers**
- **General Purpose Single Low Side Drivers**

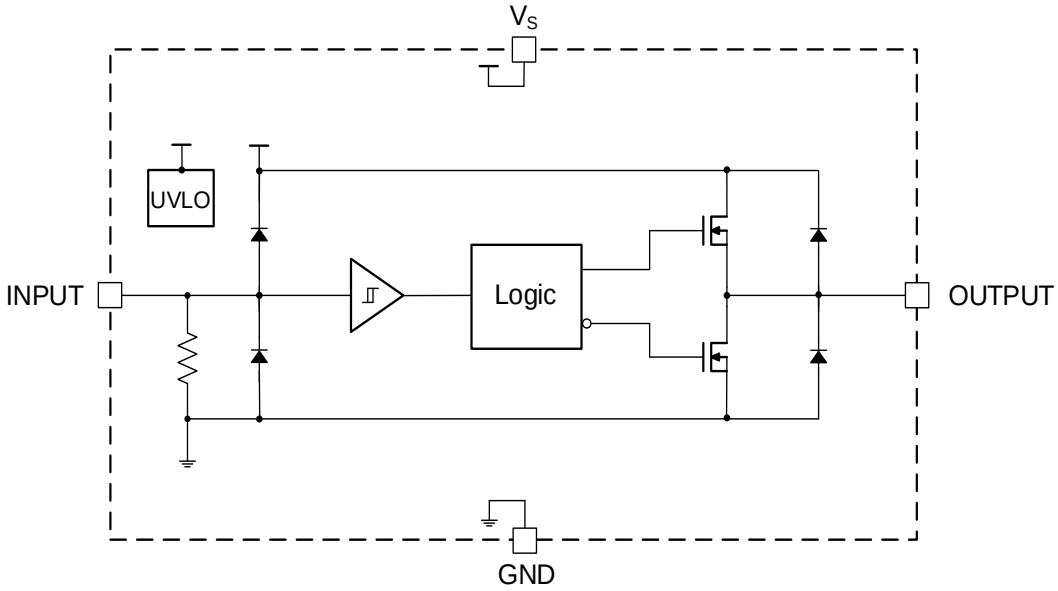
PRODUCT DESCRIPTION

The TS62273 is a single channel, high speed power MOSFET and IGBT driver, which is designed for applications that require low current signals to drive large capacitive loads with high speed. The input current is very low so that it is compatible with standard CMOS or LSTTL output. The output drivers feature a high pulse current buffer stage designed for minimum rise and fall time. Excellent latch immune performance is achieved.

PIN CONFIGURATION



BLOCK DIAGRAM



ORDERING INFORMATION

Product	Part Number	Eco Plan	Package	Container, Pack Qty
TS62273	TS62273SOT235LR	RoHS	SOT-23-5L	Reel, 3000

RECOMMENDED OPERATING CONDITIONS

Parameter	Min	Max	Unit
V_{CC} to GND Voltage	12	20	V
Input Voltage	0	V_S	V
Operating Temperature	-40	125	˚C

ABSOLUTE MAXIMUM RATINGS

Over operating free-air temperature range (unless otherwise noted) (1)

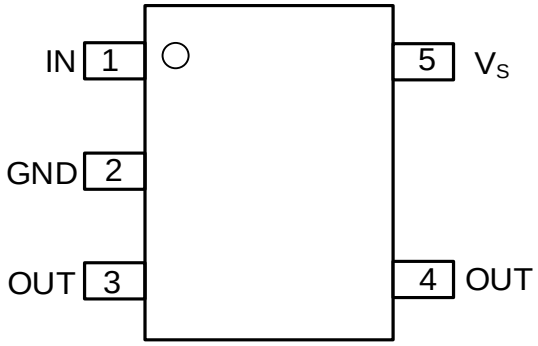
Parameter	Min	Max	Unit
V_S to GND Voltage	-0.3	20	V
Input Voltage	- 0.3	V_S + 0.3	V
Output Voltage	- 0.3	V_S + 0.3	V
Logic Input Voltage	- 0.3	V_S + 0.3	V
Package Power Dissipation @ $T_A \leq 50$˚C		120	mW
Thermal Resistance, Junction to Ambient		191	˚C/W
Junction Temperature	-40	150	˚C
Storage Temperature	-55	150	˚C
Lead Temperature (Soldering, 10s)		300	˚C
ESD HBM	±8kV Class 3B (JEDEC EIA/JESD22-A114)		
ESD MM	±300V Class B (JEDEC EIA/JESD22-A115)		
ESD CDM	±1500V Class C3 (JEDEC EIA/JESD22-C101F)		
IC Latch-Up Test	400mA @25˚C Class II, Level A (JEDEC STANDARD NO.78E NOVEMBER 2016)		

ESD CAUTION

ESD (Electrostatic Discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjects to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

(1) Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

PIN CONFIGURATION



PIN DEFINITIONS

Pin No.	Symbol	Function
1	IN	Input (with 1MΩ pull-down resistor)
2	GND	Ground
3	OUT	Output
4	OUT	Output
5	V_S	Power Supply

FUNCTION TABLE

Input	Output
L	L
H	H

ELECTRICAL CHARACTERISTICS

At T_A = +25°C, and V_S = 15V (unless otherwise noted)

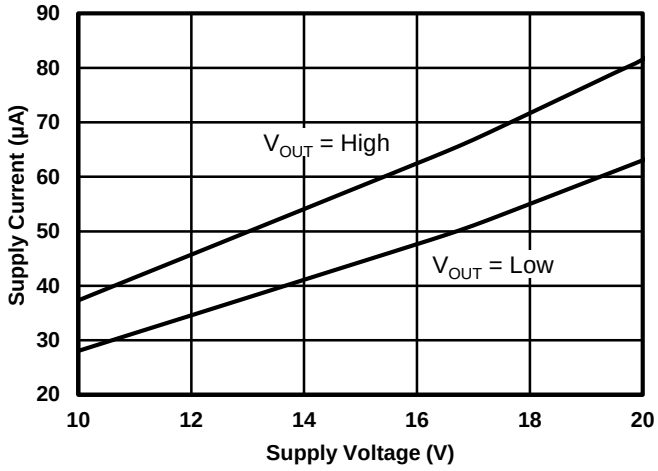
Parameter		Operating Conditions	Min	Typ	Max	Unit
Input Characteristics						
V_{IH}	Logic 1 Input Voltage		2.5			V
V_{IL}	Logic 0 Input Voltage				0.8	
I_{IN+}	Logic 1 Input Current	IN = 5V		5	15	μA
I_{IN-}	Logic 0 Input Current	IN = 0V		0		
Output Characteristics						
V_{OH_0mA}	High Output Voltage	I_{OUT} = 0mA	13.2			V
V_{OH_20mA}		I_{OUT} = 20mA		13.0		
V_{OH_60mA}		I_{OUT} = 60mA		12.6		
V_{OH_200mA}		I_{OUT} = 200mA		11.7		
V_{OL_20mA}	Low Output Voltage	I_{OUT} = 20mA			0.15	
V_{OL_60mA}		I_{OUT} = 60mA		0.06		
V_{OL_200mA}		I_{OUT} = 200mA		0.25		
R_{OH}	Output Resistance High State	I_{OUT} = 200mA		16		Ω
R_{OL}	Output Resistance Low State	I_{OUT} = -200mA		1.5		
I_{O+}	Peak Output Current	IN = 5V, OUT = 0V		2.3		A
I_{O-}		IN = 0V, OUT = V_{CC}		3.3		
Power Supply						
I_{Q+}	Quiescent Supply Current	IN = 5V		60	120	μA
I_{Q-}		IN = 0V		45	100	
$ULVO_+$	V_S Under Voltage Lockout Exit [1]			10		V
$ULVO_-$	V_S Under Voltage Lockout Enter [2]			9		
V_{S_Clamp}	V_S Zener Clamp Voltage	I_{Q+} = 5mA		22.0		
Switching Time Characteristics						
t_{on}	Turn-on Propagation Delay	Refer to Figure 2 & Figure 3		50	95	ns
t_{off}	Turn-off Propagation Delay			50	95	
t_r	Output Rise Time			25	55	
t_f	Output Fall Time			25	55	

NOTE:
[1] V_{CC} From Low to High
[2] V_{CC} From High to Low

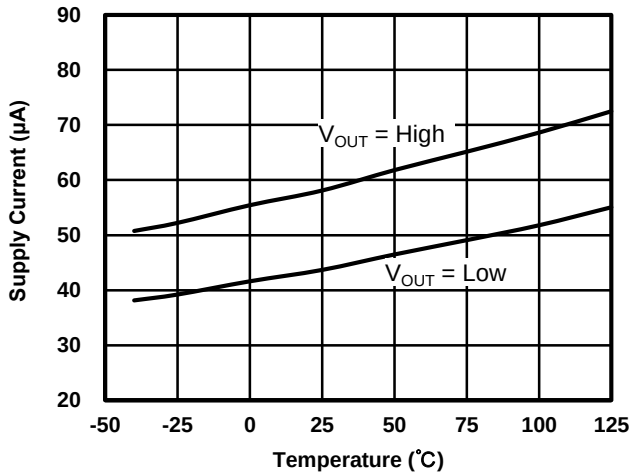
TYPICAL CHARACTERISTICS

At T_A = +25˚C, C_{LOAD} = 1nF, and V_S = 15V (unless otherwise noted)

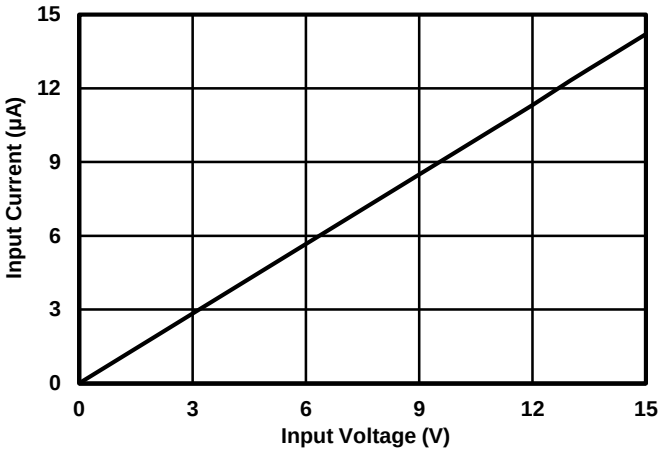
Supply Current vs Supply Voltage



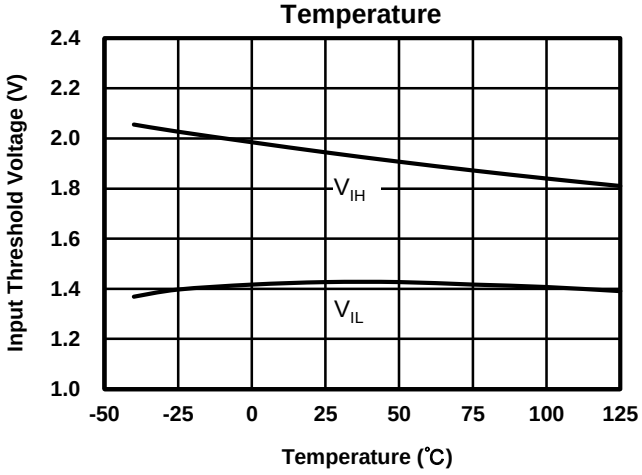
Supply Current vs Temperature



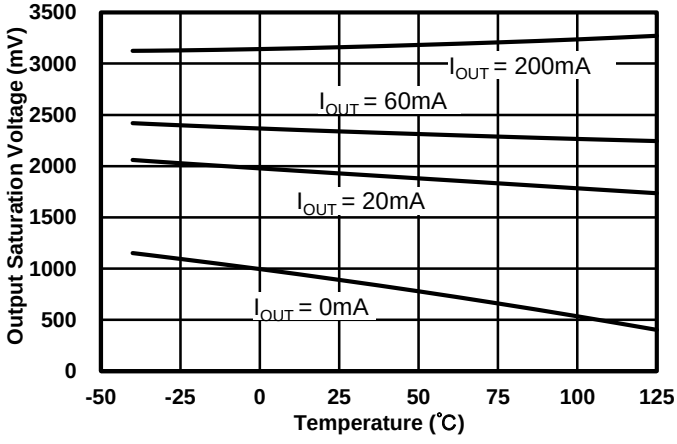
Input Current vs Input Voltage



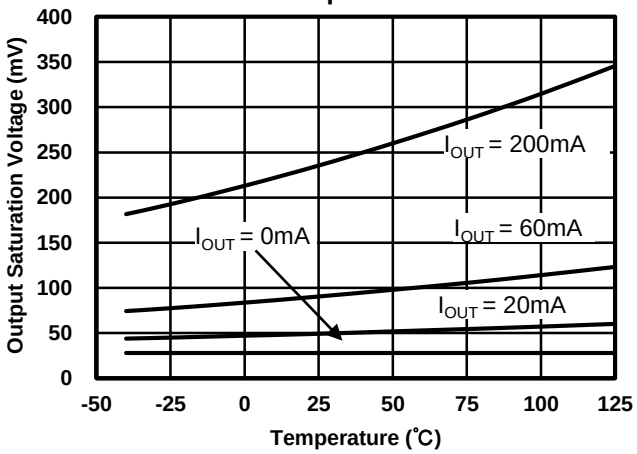
Logic Input Threshold Voltage vs Temperature



Output Source Saturation Voltage vs Temperature



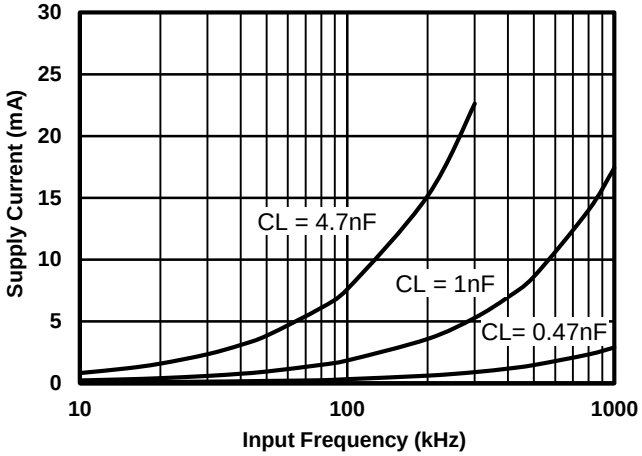
Output Sink Saturation Voltage vs Temperature



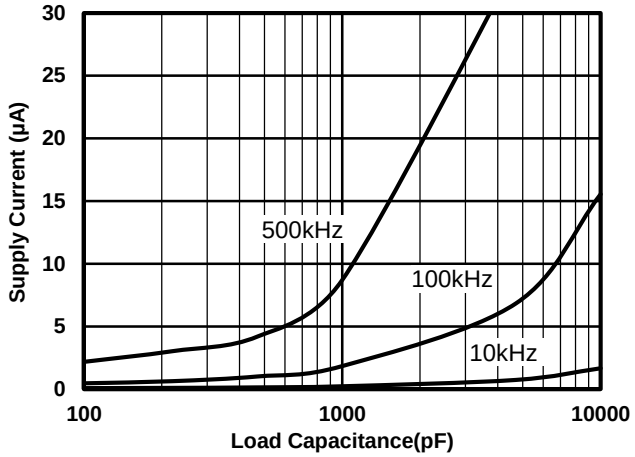
TYPICAL CHARACTERISTICS(CONTINUE)

At T_A = +25°C, C_{LOAD} = 1nF, and V_S = 15V (unless otherwise noted)

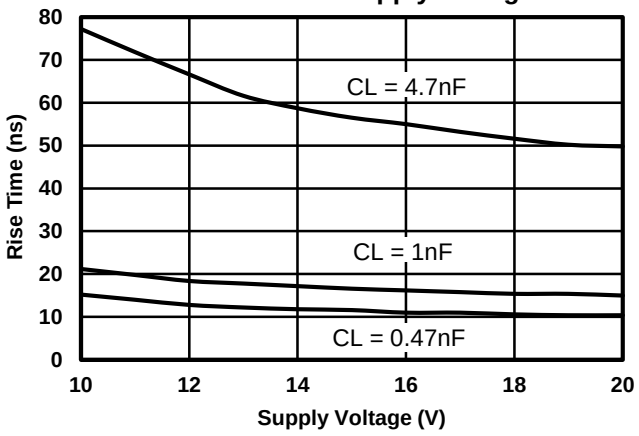
Supply Current vs Input Frequency



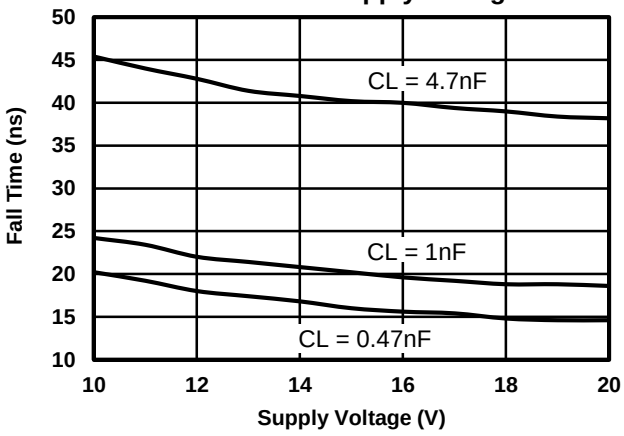
Supply Current vs Load Capacitance



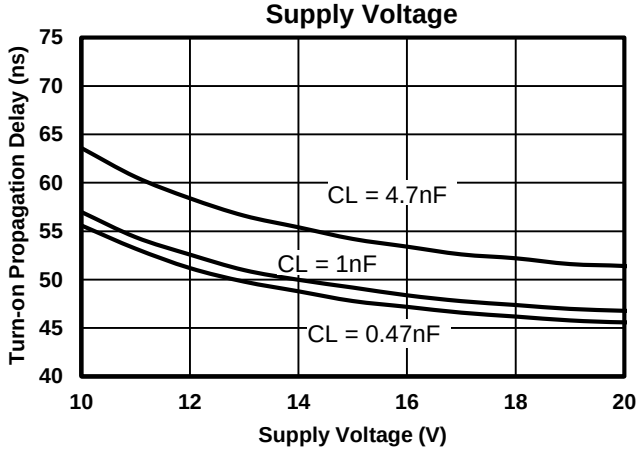
Rise Time vs Supply Voltage



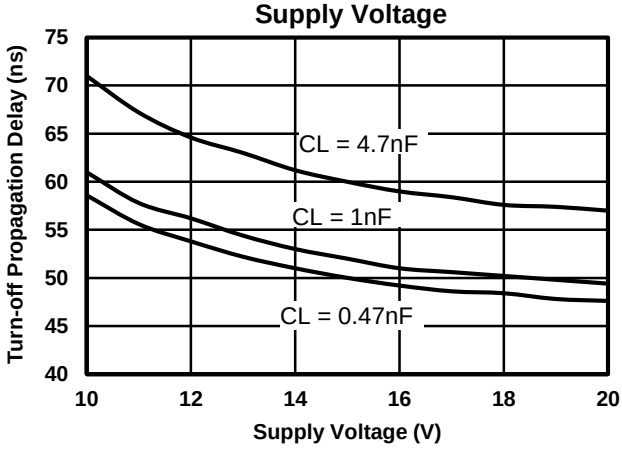
Fall Time vs Supply Voltage



Turn-on Propagation Delay vs Supply Voltage



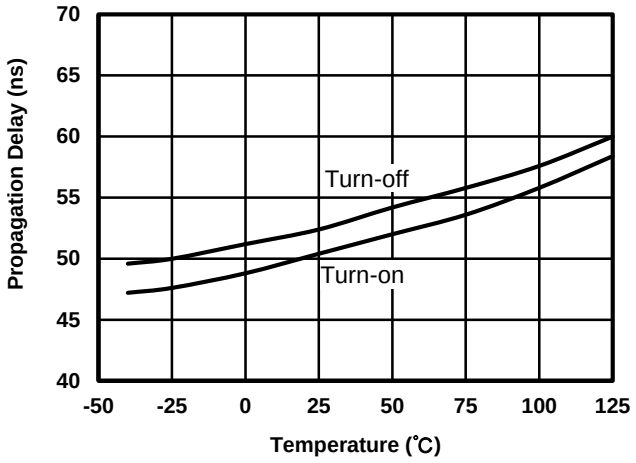
Turn-off Propagation Delay vs Supply Voltage



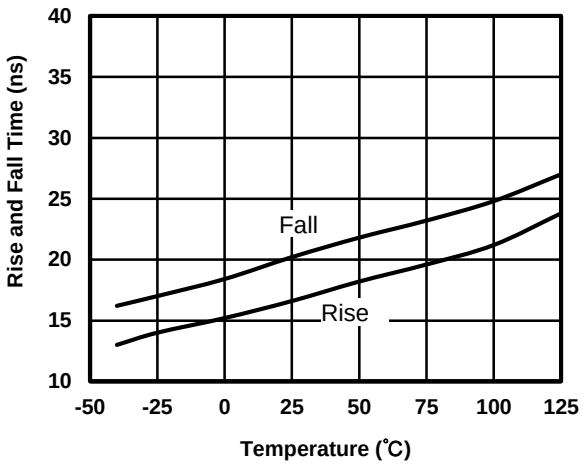
TYPICAL CHARACTERISTICS

At T_A = +25°C, C_{LOAD} = 1nF, and V_S = 15V (unless otherwise noted)

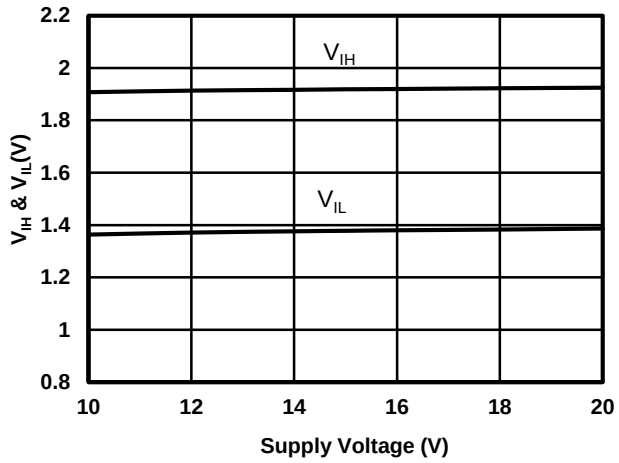
Propagation Delay Time vs Temperature



Output Rise and Fall Time vs Temperature



V_{IH} & V_{IL} vs Supply Voltage



APPLICATION NOTES & ADDITIONAL DETAILS

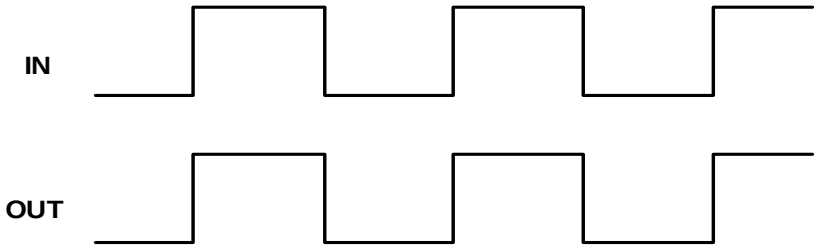


Figure 1. Input / Output Timing Diagram

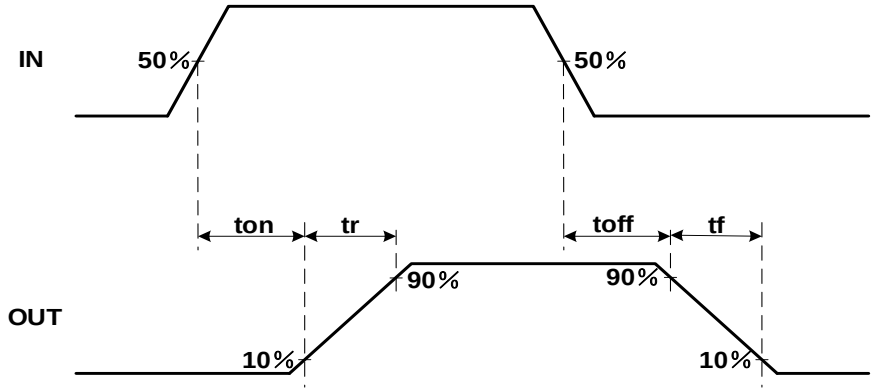


Figure 2. Switching Time Waveform Definitions

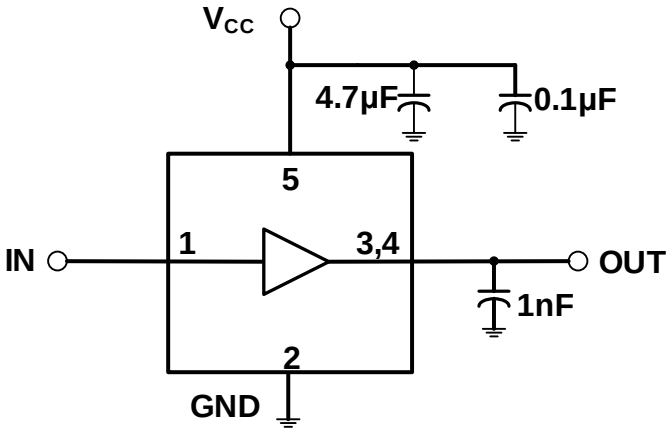
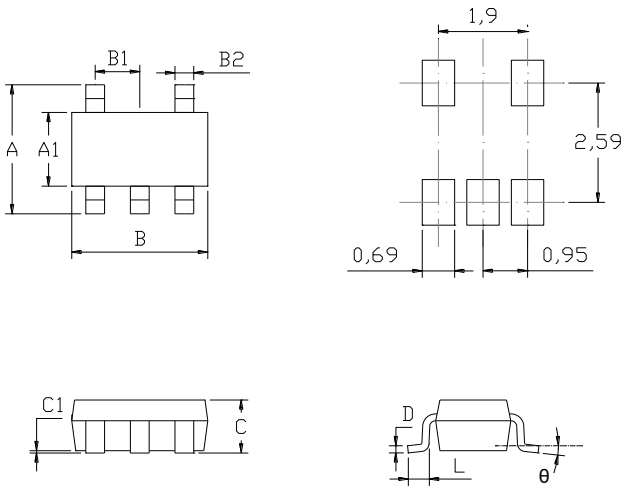


Figure 3. Test Circuit for Switching Time

MECHANICAL DIMENSIONS

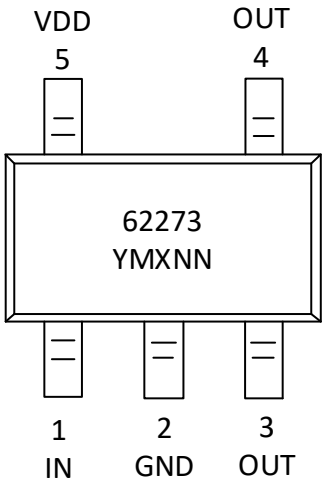
SOT-23-5L PACKAGE MECHANICAL DRAWING



SOT-23-5L PACKAGE MECHANICAL DATA

symbol	dimensions			
	millimeters		inches	
	min	max	min	max
A	2.650	2.950	0.104	0.116
A1	1.500	1.700	0.059	0.067
B	2.820	3.020	0.111	0.119
B1	0.950		0.037	
B2	0.300	0.500	0.012	0.020
C		1.250		0.049
C1	0	0.100	0.000	0.004
L	0.300	0.600	0.012	0.024
D	0.100	0.200	0.004	0.008
θ	0°	8°	0°	8°

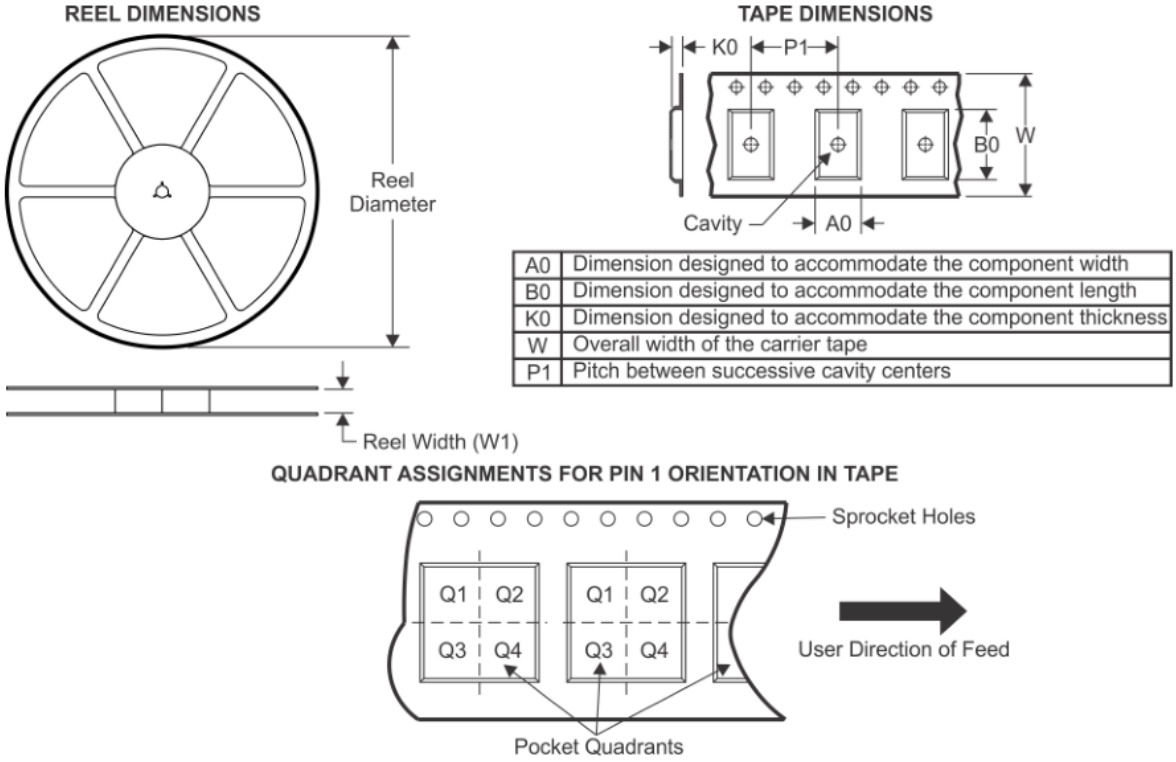
PACKAGING MARKING INFORMATION



Legend	**62273**	**Product Name**
	Y	**Year Code**
	M	**Monthly Code**
	X	**Factory Code**
	NN	**Batch Number**

Year Code	A	B	C	D	E	F	G	H	I	J	K	L
Y	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Monthly Code	A	B	C	D	E	F	G	H	I	J	K	L
M	1 月	2 月	3 月	4 月	5 月	6 月	7 月	8 月	9 月	10 月	11 月	12 月

TAPE AND REEL INFORMATION



A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

Device	Package Type	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadran
TS62273SOT235LR	SOT-23-5L	5	3000	180.0	9.0	3.2	3.3	1.4	4.0	8.0	Q3

REVISION HISTORY

NOTE: Page numbers for previous revisions may be different from that of the current version.

2020/9/4 — REV KY1.0.1B to REV KY1.0.2B

Added notice to ABSOLUTE MAXIMUM RATINGS 2
Updated the format of ELECTRICAL CHARACTERISTICS 3

2020/7/8 — REV KY1.0.2B TO REV KY1.1.2B

Updated ABSOLUTE MAXIMUM RATINGS 2
Add REVISION HISTORY 11

2020/7/16 — REV KY1.1.2B TO REV KY1.2.2B

Updated ABSOLUTE MAXIMUM RATINGS 2

2022/6/24 — REV KY1.2.2B to REV KY1.2.3B

Add PACKAGING MARKING INFORMATION.....10

2022/10/21 — REV KY1.2.3B TO REV KY1.3.3B

Add Roh&Rol 4

CONTACT INFORMATION

Trusignal Microelectronics

Phone: +86 512-65923982
Fax: +86 512-65923995
Email: support@kunyuanic.com; sales@kunyuanic.com