



## 2N7002T

Power MOSFET

### 300mA, 60V N-CHANNEL POWER MOSFET

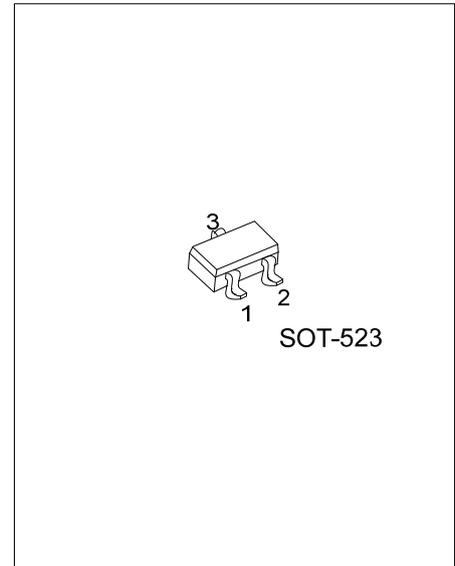
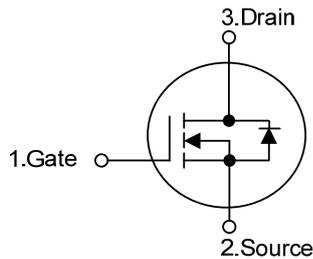
#### DESCRIPTION

The UTC **2N7002T** uses advanced technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

#### FEATURES

- \* High Density Cell Design for Low  $R_{DS(ON)}$ .
- \* Voltage Controlled Small Signal Switch
- \* Rugged and Reliable
- \* High Saturation Current Capability

#### SYMBOL



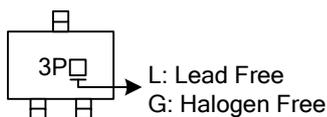
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
2N7002TL-AN3-R	2N7002TG-AN3-R	SOT-523	G	S	D	Tape Reel

Note: Pin Assignment: G: Gate S: Source D: Drain

Ordering Number	(1)Packing Type	(1) R: Tape Reel
2N7002TG-AN3-R	(2)Package Type	(2) AN3: SOT-523
	(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

#### MARKING



■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C, unless otherwise specified.)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V <sub>DSS</sub>	60	V
Drain-Gate Voltage (R <sub>GS</sub> ≤ 1MΩ)	V <sub>DGR</sub>	60	V
Gate Source Voltage	Continuous	±20	V
	Non Repetitive(tp < 50μs)	±40	
Drain Current	Continuous	300	mA
	Pulsed	800	
Power Dissipation	P <sub>D</sub>	200	mW
Derated Above 25°C		1.6	mW/°C
Junction Temperature	T <sub>J</sub>	+ 150	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ <sub>JA</sub>	625 (Note1)	°C/W

■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =10μA	60			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V			1	μA
Gate-Source Leakage Current	I <sub>GSSF</sub>	V <sub>GS</sub> =20V, V <sub>DS</sub> =0V			100	nA
	I <sub>GSSR</sub>	V <sub>GS</sub> =-20V, V <sub>DS</sub> =0V			-100	nA
<b>ON CHARACTERISTICS (Note2)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> =250μA	1.0		2.5	V
Drain-Source On-Voltage	V <sub>DS(ON)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> =300mA		0.6	3.75	V
		V <sub>GS</sub> = 5.0V, I <sub>D</sub> =50mA		0.09	1.5	
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =300mA			13.5	Ω
		V <sub>GS</sub> =5.0V, I <sub>D</sub> =50mA			7.5	Ω
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz		20	50	pF
Output Capacitance	C <sub>OSS</sub>			11	25	pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			4	5	pF
Turn-On Time	t <sub>ON</sub>	V <sub>DD</sub> =30V, R <sub>L</sub> =150Ω, I <sub>D</sub> =200mA, V <sub>GS</sub> =10V, R <sub>GEN</sub> =25Ω			20	nS
Turn-Off Time	t <sub>OFF</sub>	V <sub>DD</sub> =30V, R <sub>L</sub> =25Ω, I <sub>D</sub> =200mA, V <sub>GS</sub> =10V, R <sub>GEN</sub> =25Ω			20	nS
<b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>				300	mA
Maximum Pulsed Drain-Source Diode Forward Current	I <sub>SM</sub>				0.8	A
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =300mA (Note)		0.88	1.5	V

Notes: 1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch. Minimum land pad size.

2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2.0%

■ TEST CIRCUIT AND WAVEFORM

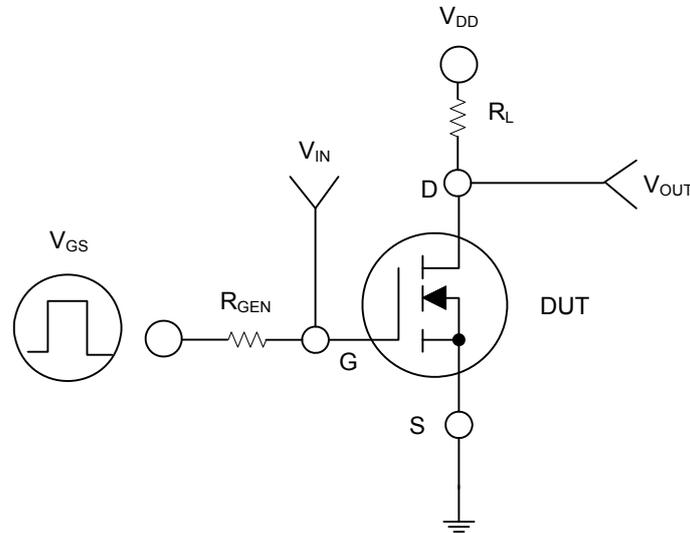


Fig. 1

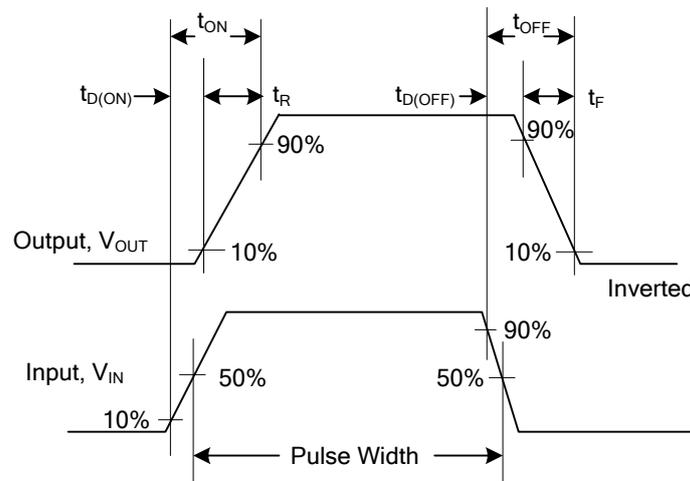


Fig. 2 Switching Waveforms

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