



2N7002DW

Power MOSFET

300mA, 60V DUAL N-CHANNEL POWER MOSFET

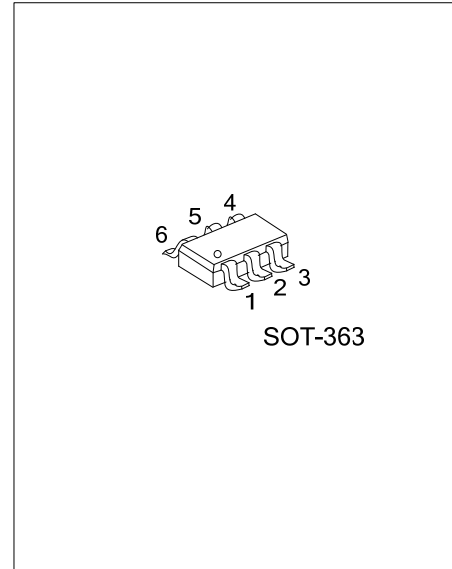
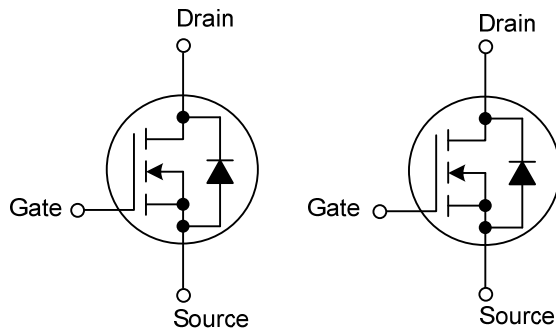
■ DESCRIPTION

The UTC **2N7002DW** 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



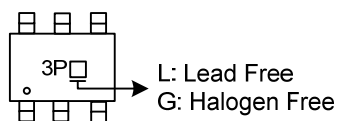
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
2N7002DWL-AL6-R	2N7002DWG-AL6-R	SOT-363	S1	G1	D2	S2	G2	D1	Tape Reel

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

<p>2N7002DWG-AL6-R</p>	<p>(1) Packing Type (1) R: Tape Reel</p> <p>(2) Package Type (2) AL6: SOT-363</p> <p>(3) Green Package (3) G: Halogen Free and Lead Free</p>
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■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise noted.)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V _{DSS}	60	V
Drain-Gate Voltage (R _{GS} ≤1MΩ)	V _{DGR}	60	V
Gate Source Voltage	V _{GSS}	±20	V
		±40	
Drain Current	I _D	300	mA
		800	
Power Dissipation	P _D	200	mW
Derated Above 25°C		1.6	mW/°C
Junction Temperature	T _J	+ 150	°C
Storage Temperature	T _{STG}	-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 _{JA}	625 (Note1)	°C/W

■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =10μA	60			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	I _{GSSF}	V _{GS} =20V, V _{DS} =0V			100	nA
		V _{GS} =-20V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS (Note 2)						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D =250μA	1	2.1	2.5	V
Drain-Source On-Voltage	V _{DS(ON)}	V _{GS} = 10V, I _D =300mA		0.6	3.75	V
		V _{GS} = 5.0V, I _D =50mA		0.09	1.5	
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =300mA			2.0	Ω
		V _{GS} =10V, I _D =300mA, T _J =125°C			4.0	Ω
		V _{GS} =5.0V, I _D =50mA			3.0	Ω
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		20	50	pF
Output Capacitance	C _{OSS}			11	25	pF
Reverse Transfer Capacitance	C _{RSS}			4	5	pF
Turn-On Time	t _{ON}	V _{DD} =30V, R _L =150Ω I _D =200mA, V _{GS} =10V R _{GEN} =25Ω			20	nS
Turn-Off Time	t _{OFF}	V _{DD} =30V, R _L =25Ω I _D =200mA, V _{GS} =10V R _{GEN} =25Ω			20	nS
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =300mA (Note)		0.88	1.5	V
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}				0.8	A
Maximum Continuous Drain-Source Diode Forward Current	I _S				300	mA

Note: 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

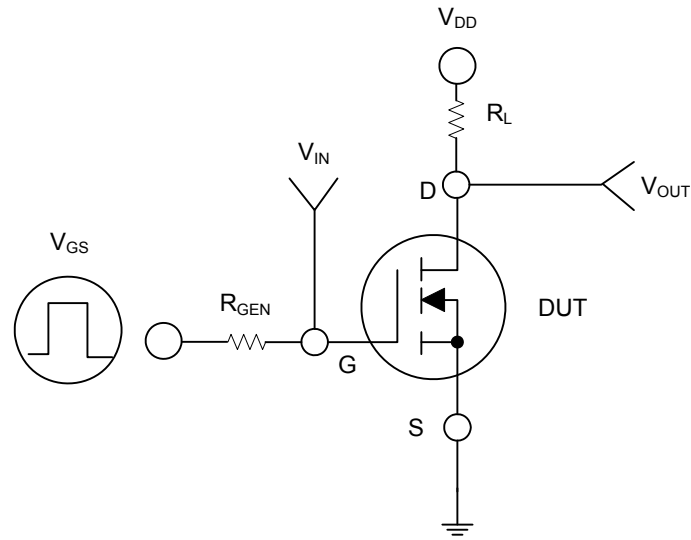


Fig. 1

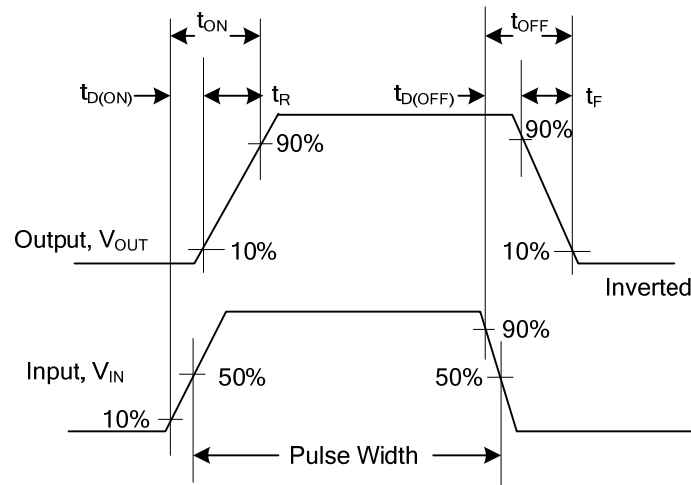
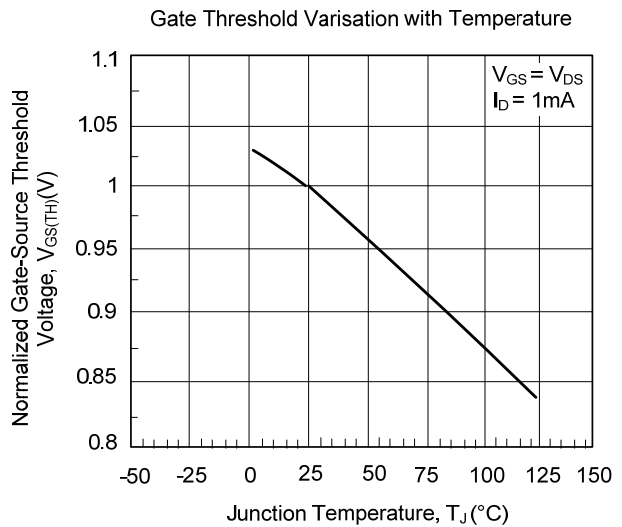
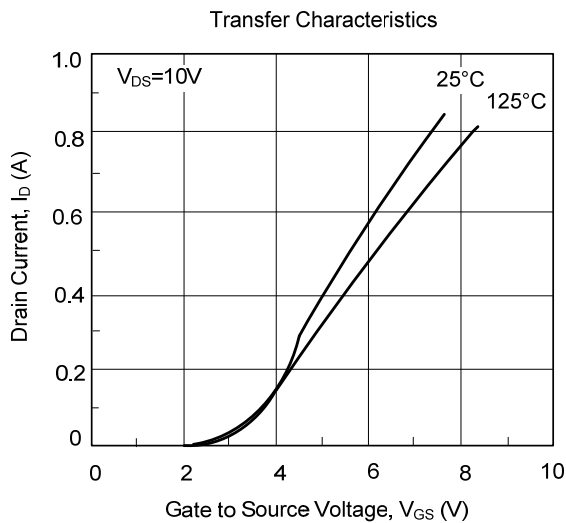
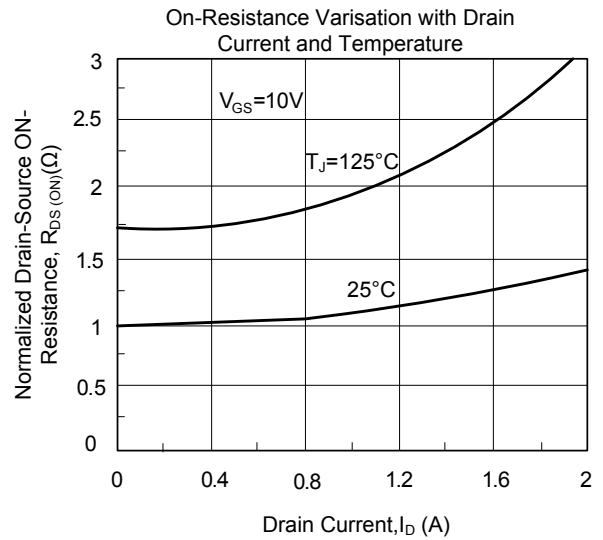
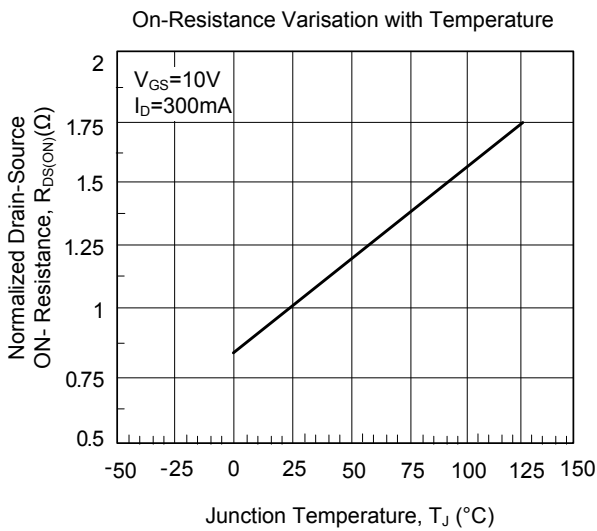
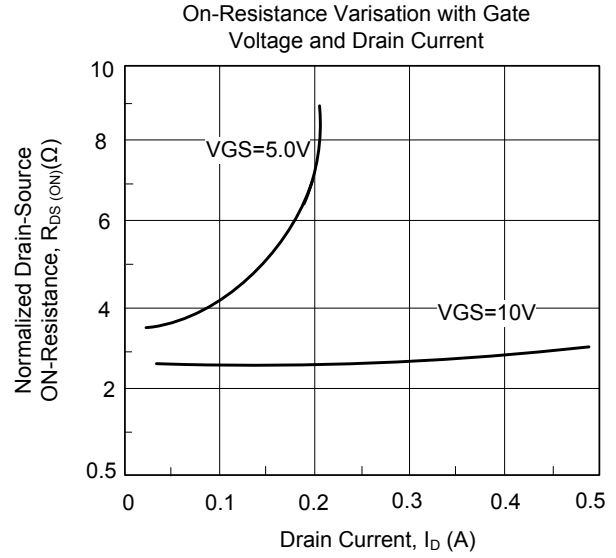
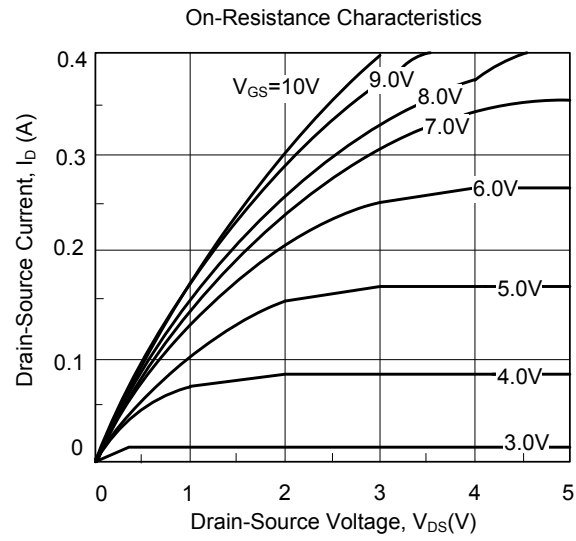


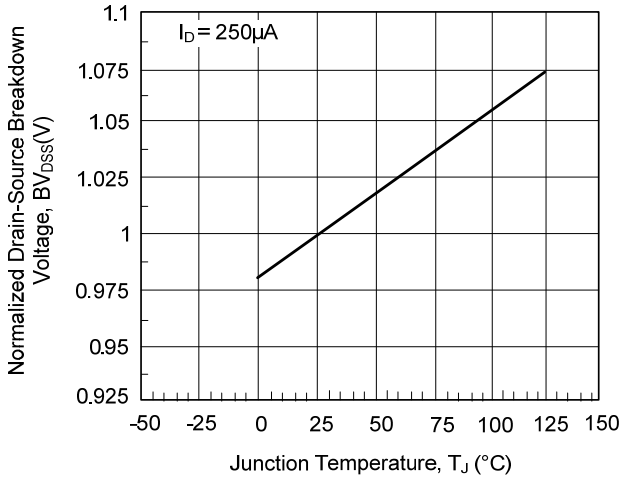
Fig. 2 Switching Waveforms

■ TYPICAL CHARACTERISTICS

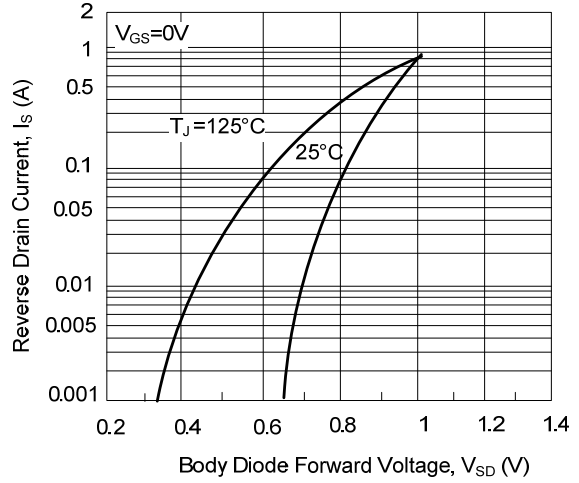


■ TYPICAL CHARACTERISTICS (Cont.)

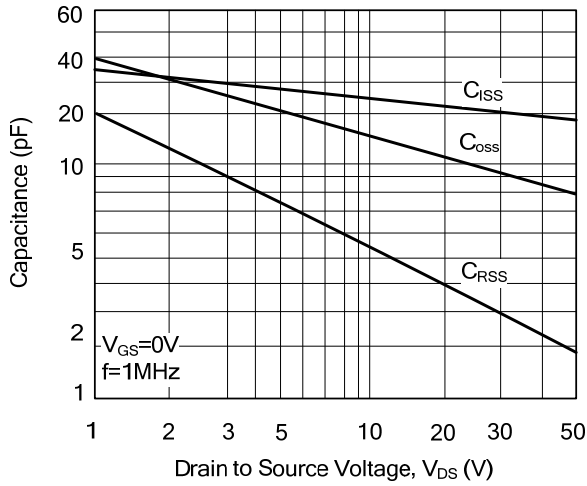
Breakdown Voltage Variation with Temperature



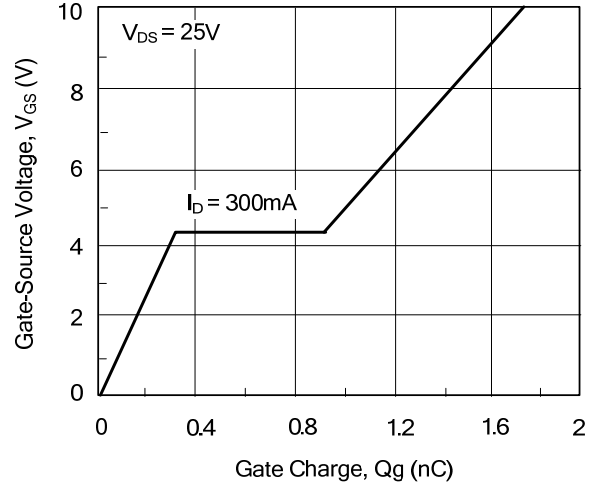
Body Diode Forward Voltage Variation with Temperature



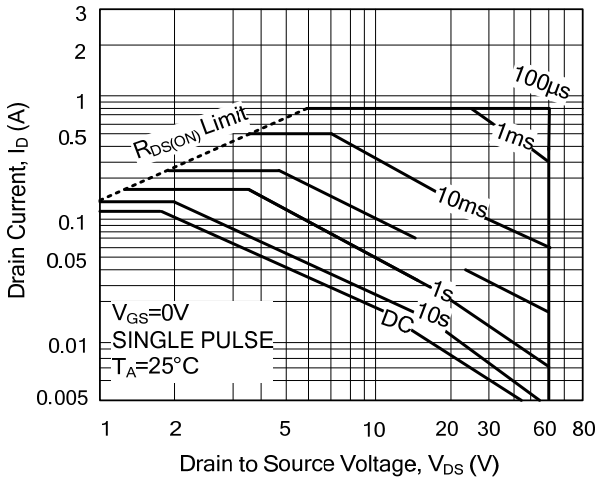
Capacitance Characteristics



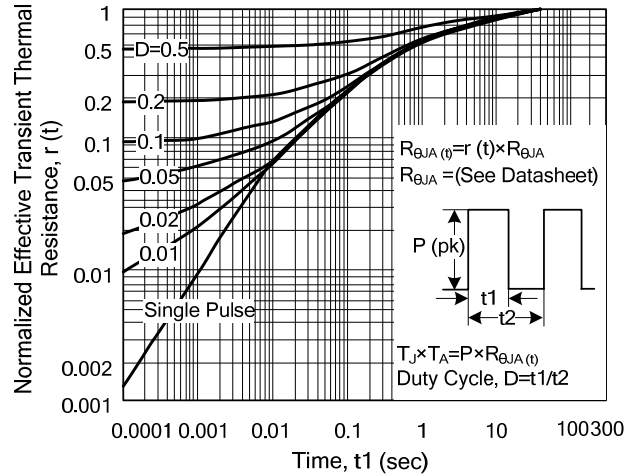
Gate Charge Characteristics



Maximum Safe Operating Area



Transient Thermal Response Curve



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