

**2N7002Z****Power MOSFET**

300mA, 60V N-CHANNEL ENHANCEMENT MODE POWER MOSFET

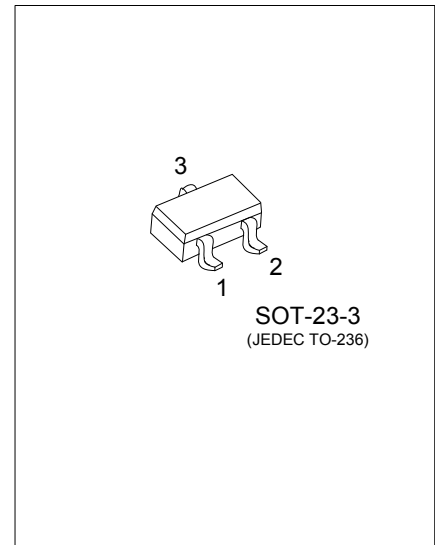
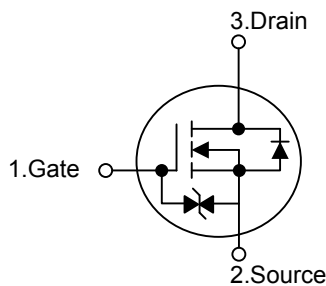
DESCRIPTION

The UTC **2N7002Z** 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

- * Low Reverse Transfer Capacitance
- * ESD Protected
- * Fast Switching Capability
- * Avalanche Energy Specified
- * Improved dv/dt Capability, High Ruggedness

SYMBOL



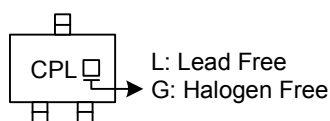
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
2N7002ZL-AE2-R	2N7002ZG-AE2-R	SOT-23-3	G	S	D	Tape Reel

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

2N7002ZG-AE2-R 	(1) R: Tape Reel (2) AE2: SOT-23-3 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING



■ **ABSOLUTE MAXIMUM RATINGS** ($T_A=25^\circ\text{C}$, unless otherwise specified.)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	Continuous	300	mA
	Pulse(Note 2)	800	
Power Dissipation	P_D	225	mW
Derating above $T_A=25^\circ\text{C}$		1.6	mW/ $^\circ\text{C}$
Junction Temperature	T_J	+150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$

Notes: 1. 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.

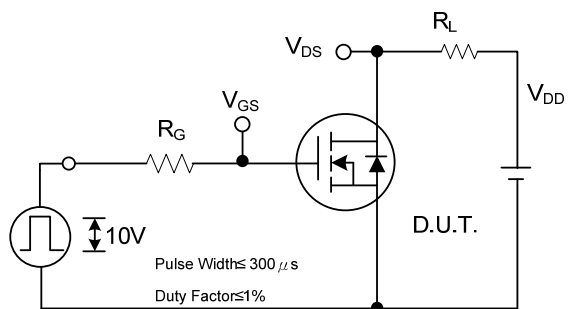
2. Pulse width $\leq 10\mu\text{s}$, Duty cycle $\leq 1\%$.

■ **ELECTRICAL CHARACTERISTICS** ($T_A=25^\circ\text{C}$, unless otherwise specified.)

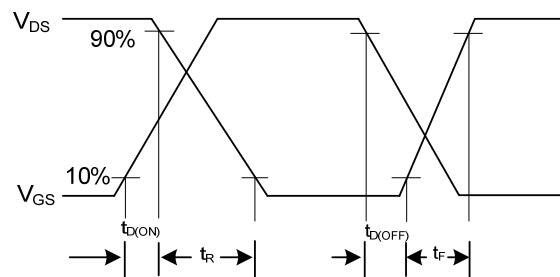
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =10μA	60			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±10	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =10V, I _D =1mA	1.0	1.85	2.5	V
Static Drain-Source On-Resistance (Note)	R _{DS(ON)}	V _{GS} =10V, I _D =300mA			4.0	Ω
		V _{GS} =4.5V, I _D =50mA			6.0	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		22	50	pF
Output Capacitance	C _{OSS}			9	25	pF
Reverse Transfer Capacitance	C _{RSS}			4	5.0	pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	t _{D(ON)}	I _D =0.2 A, V _{DD} =30V, V _{GS} =10V, R _L =150Ω, R _G =10Ω		1.3	20	ns
Turn-OFF Delay Time	t _{D(OFF)}			4.2	30	ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Maximum Continuous Drain-Source Diode Forward Current	I _S				300	mA
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}				0.8	A
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =300mA (Note)		0.88	1.5	V

Note: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 1\%$

■ TEST CIRCUITS AND WAVEFORMS

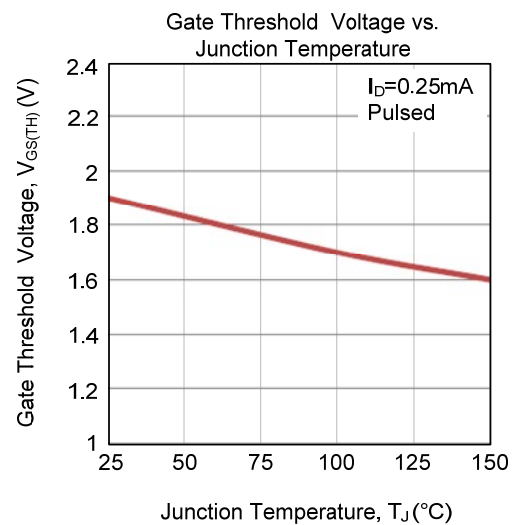
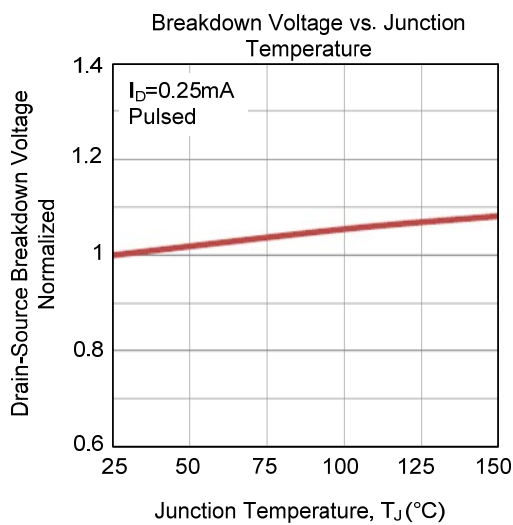
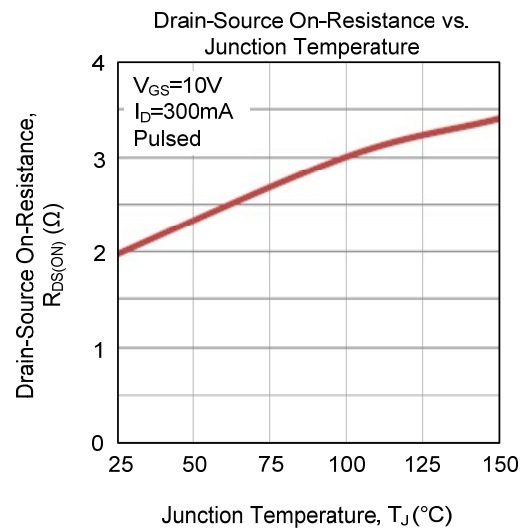
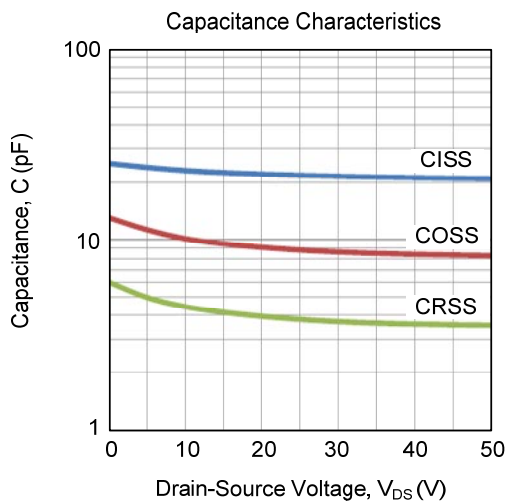
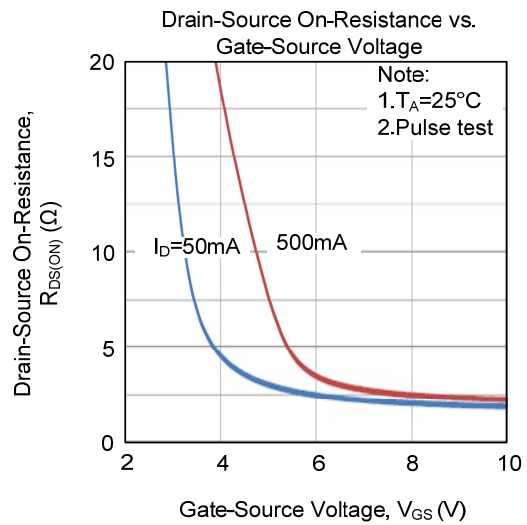
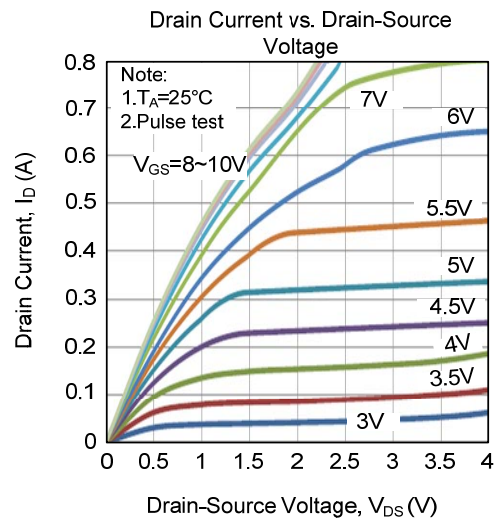


Switching Test Circuit

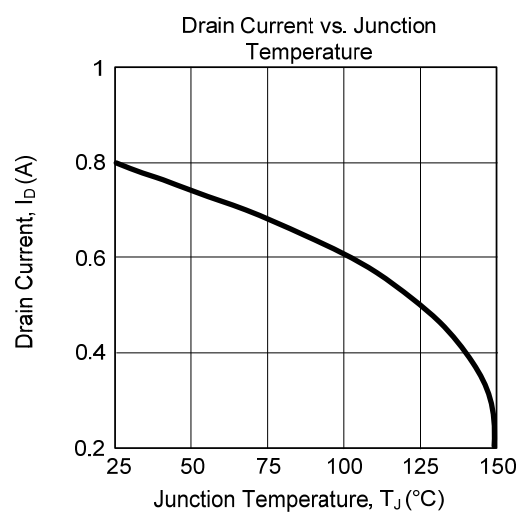
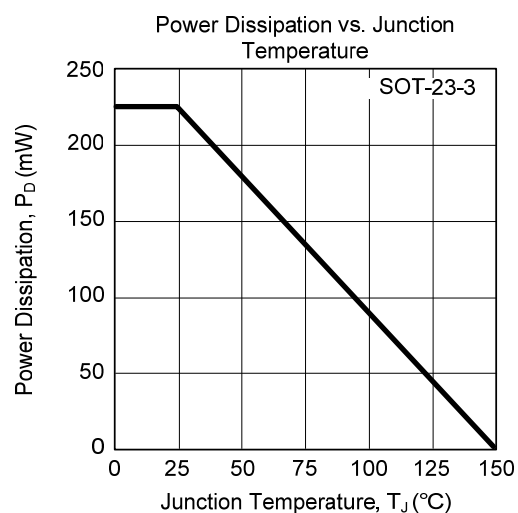
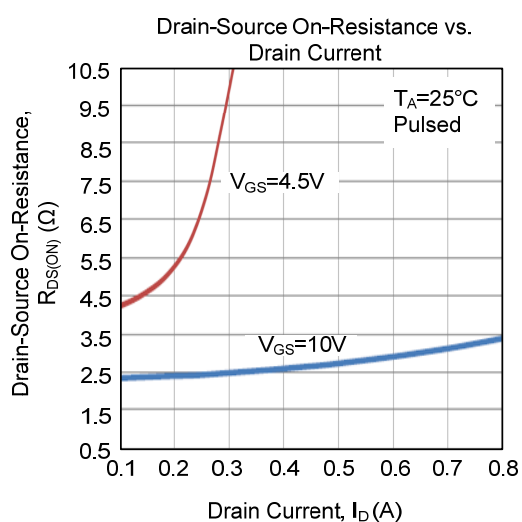
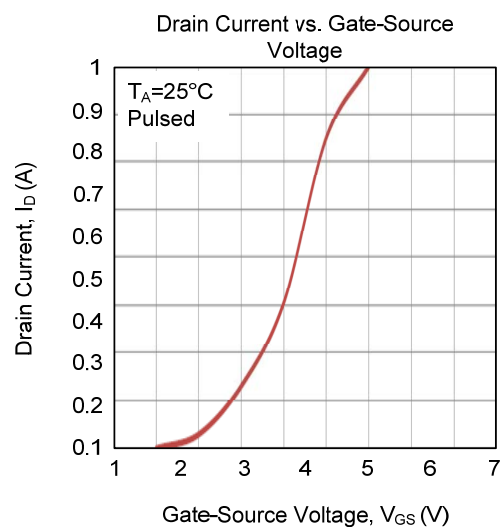
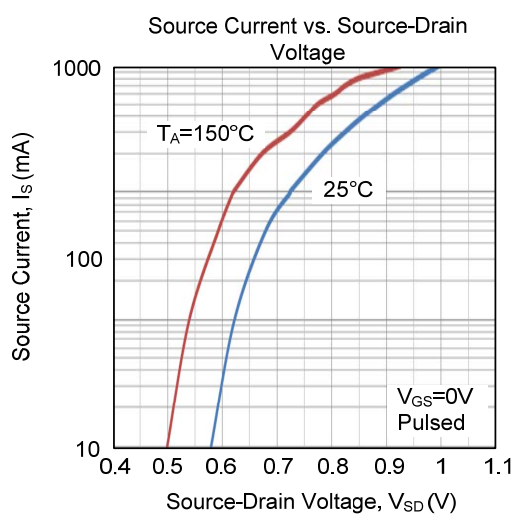


Switching Waveforms

TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



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