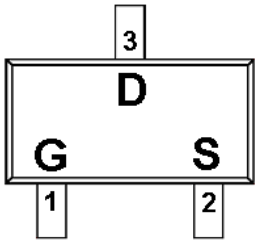
SPN7002U
N-Channel Enhancement Mode MOSFET

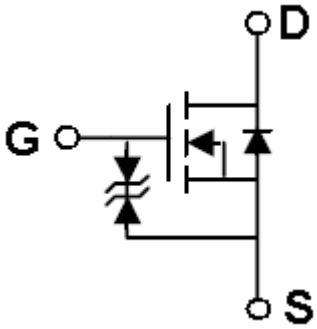
DESCRIPTION
The SPN7002U is the N-Channel enhancement mode field effect transistors are produced using high cell density DMOS technology. These products have been designed to minimize on-state resistance while provide rugged, reliable, and fast switching performance. They can be used in most applications requiring up to 640mA DC and can deliver pulsed currents up to 950mA. These products are particularly suited for low voltage, low current applications such as small servo motor control, power MOSFET gate drivers, and other switching applications.

APPLICATIONS
- Drivers: Relays, Solenoids, Lamps, Hammers, Display, Memories, Transistors, etc.
- High saturation current capability. Direct Logic-Level Interface: TTL/CMOS
- Battery Operated Systems
- Solid-State Relays

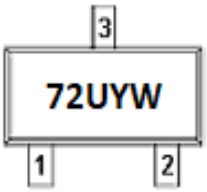
FEATURES
- 60V/0.50A , $R_{DS(ON)}$=3.0Ω@V_{GS}=10V
- 60V/0.20A , $R_{DS(ON)}$=4.0Ω@V_{GS}=4.5V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- Exceptional on-resistance and maximum DC current capability
- ESD protected: 2KV
- SOT-323 package design

PIN CONFIGURATION(SOT-323)





PART MARKING



YW : Date Code

SPN7002U
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PIN DESCRIPTION

Pin	Symbol	Description
1	G	Gate
2	S	Source
3	D	Drain

ORDERING INFORMATION

Part Number	Package	Part Marking
SPN7002US32RGB	SOT-323	72U

※ SPN7002US32RGB : Tape Reel ; Pb – Free ; Halogen – Free

ABSOULTE MAXIMUM RATINGS (T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	60	V
Gate –Source Voltage - Continuous		V_{GSS}	±20	V
Continuous Drain Current(T_J=150℃)	T_A=25℃	I_D	0.64	A
Pulsed Drain Current (*)		I_{DM}	0.95	A
Power Dissipation	T_A=25℃	P_D	1.35	W
Operating Junction Temperature		T_J	-55 ~ 150	℃
Storage Temperature Range		T_{STG}	-55 ~ 150	℃
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	375	℃/W

(*) Pulse width limited by safe operating area

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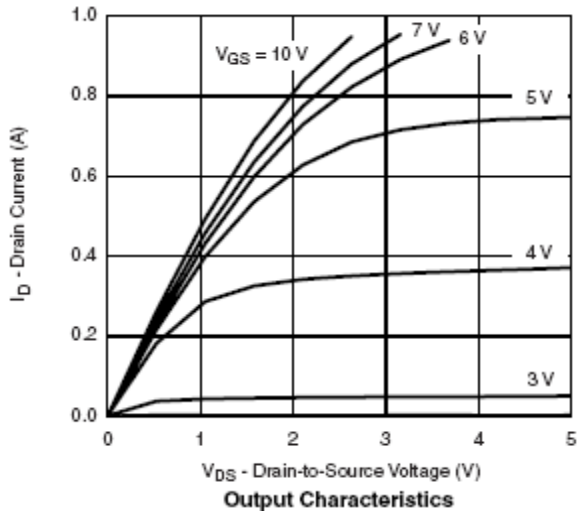
ELECTRICAL CHARACTERISTICS (T_A=25℃ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250uA	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	1.0	1.7	2.5	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±30	uA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V,V_{GS}=0V T_J=25℃			10	uA
		V_{DS}=48V,V_{GS}=0V T_J=70℃			100	
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=0.50A			3.0	Ω
		V_{GS}=4.5V,I_D=0.20A			4.0	
Forward Transconductance	Gfs(1)	V_{DS}=10V, I_D=0.6A		0.6		S
Diode Forward Voltage	V_{SD}(1)	V_{GS}=0V, I_S=0.45A			1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DD}=50V, I_D=0.6A, V_{GS}=4.5V		1.0	1.6	nC
Gate-Source Charge	Q_{gs}			0.5		
Gate-Drain Charge	Q_{gd}			0.5		
Input Capacitance	C_{iss}	V_{DS}=25V, f=1MHz, V_{GS}=0V		32	50	pF
Output Capacitance	C_{oss}			8		
Reverse Transfer Capacitance	C_{rss}			6		
Turn-On Time	$t_{d(on)}$	V_{DD}=30V, I_D=0.6A R_G=3.3Ω , V_{GS}=10.0V R_D=52Ω		12		nS
	t_r			10		
Turn-Off Time	$t_{d(off)}$			56		
	t_f			29		

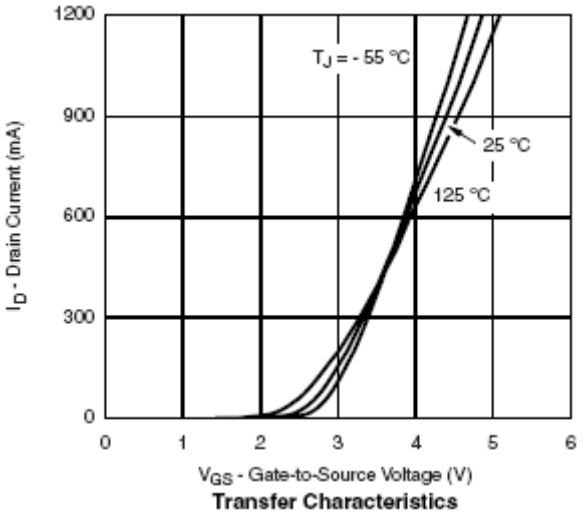
(1) Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %.

(2) Pulse width limited by safe operating area.

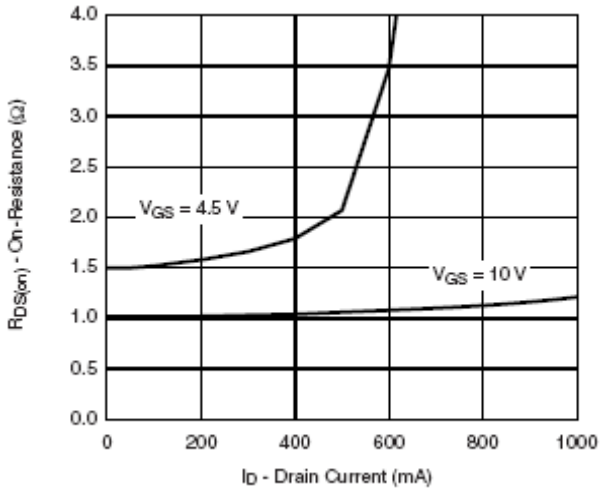
TYPICAL CHARACTERISTICS



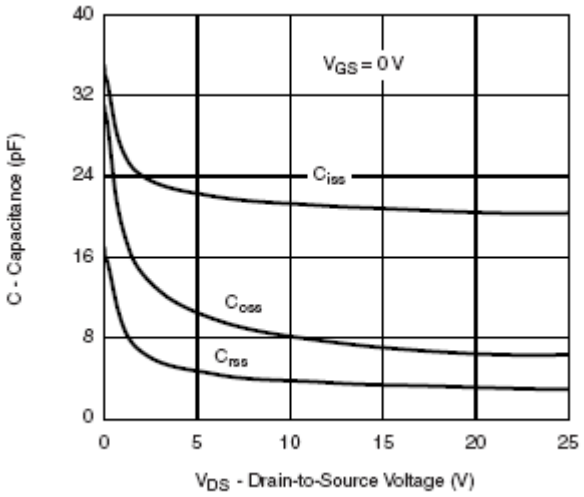
Output Characteristics



Transfer Characteristics

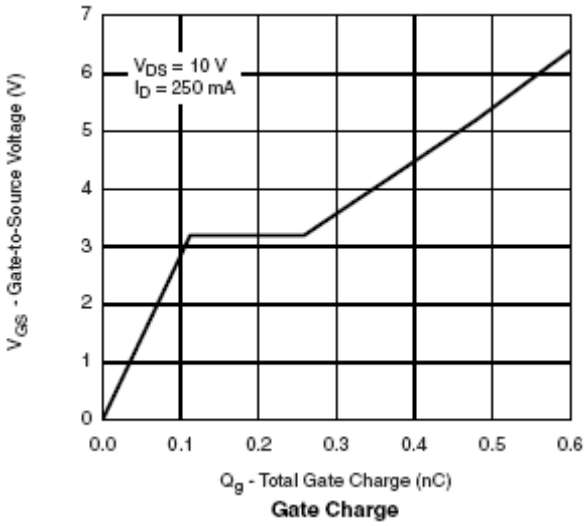


On-Resistance vs. Drain Current

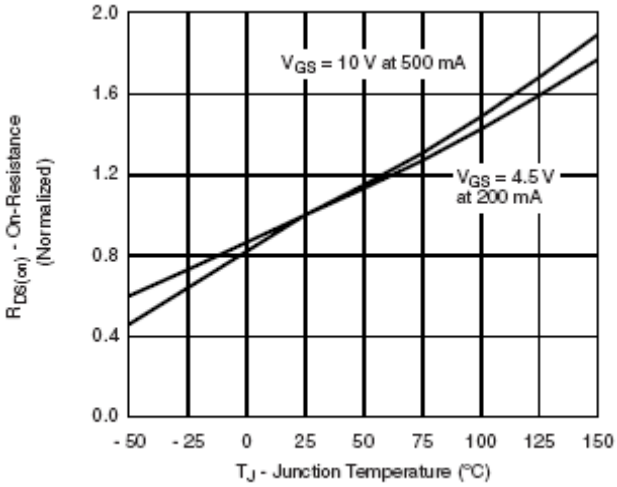


Capacitance

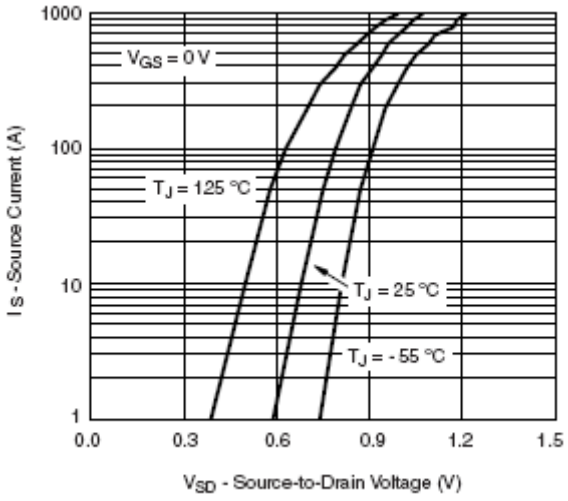
TYPICAL CHARACTERISTICS



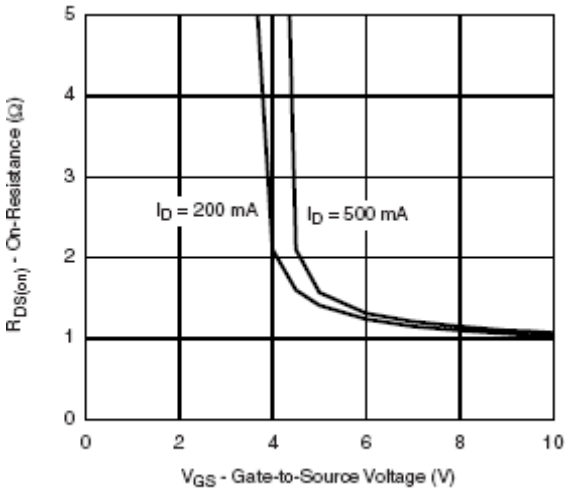
Gate Charge



On-Resistance vs. Junction Temperature

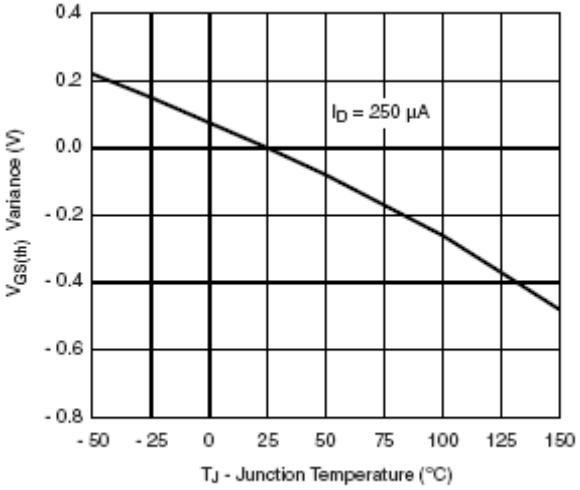


Source-Drain Diode Forward Voltage

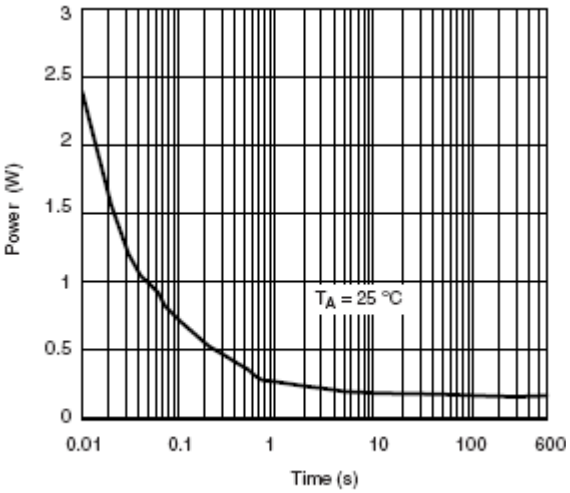


On-Resistance vs. Gate-Source Voltage

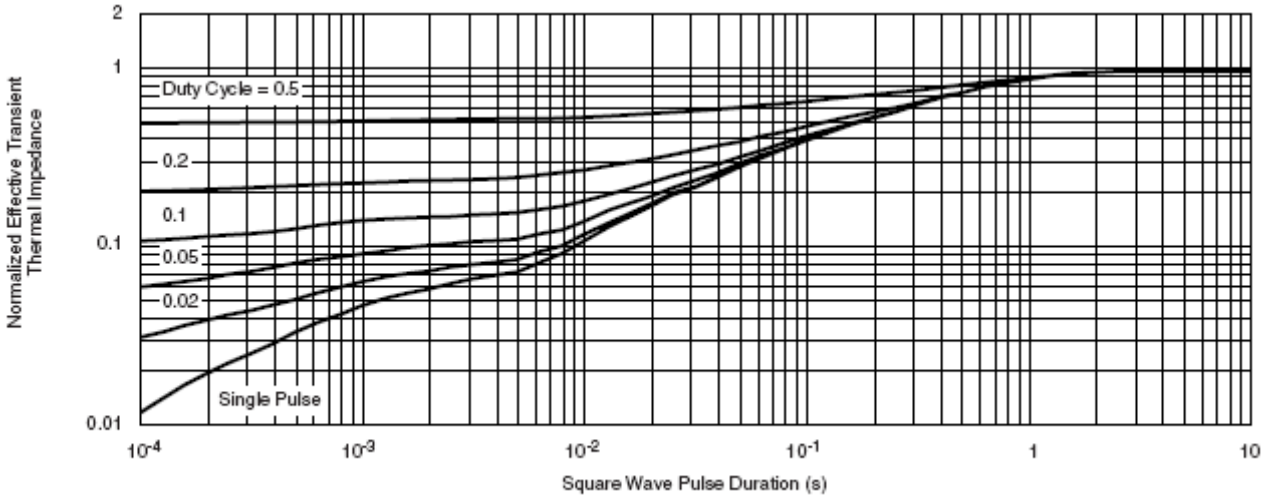
TYPICAL CHARACTERISTICS



Threshold Voltage Variance Over Temperature



Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

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