

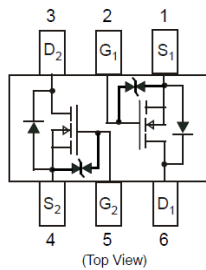
N-Channel 60V MOSFET

Features:

- Low on-resistance.
- Fast switching speed.
- Low voltage drive.
- Halogen free
- ESD protected 2000V

Application

- DC-DC
- Portable appliance
- Power management



$B_{VDSS} = 60V$,
 $R_{DS(ON)} < 2.3\Omega @ V_{GS} = 10V$
 $R_{DS(ON)} < 2.7\Omega @ V_{GS} = 5V$
 $I_D = 380mA$

Absolute Maximum Ratings (T_A=25°C Unless Otherwise Noted)

Parameter	Symbol	2N7002KDW	Unit
	Marking	72K	
Drain-Source Voltage	V _{DSS}	60	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current (Note 1)	I _D	T _a =25°C	380 mA
		T _a =85°C	270 mA
Pulsed Drain Current (t _p = 10 us)	I _{DM}	1.5	A
Power Dissipation (Note 1)	P _D	420	mW
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to 150	°C

Note : 1. Surface mounted on FR4 board using 1 in sq pad size (Cu area = 1.127 in sq [1 oz] including traces)

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Electrical Characteristics ($T_A = 25^\circ\text{C}$ Unless Otherwise Specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	--	--	V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	--	2.5	V
I_{GSS}	Gate-Body Leakage	$V_{DS}=0V, V_{GS}=\pm 20V$	--	--	± 10	μA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V$	--	--	1	μA
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{GS}=10V, I_D=0.5A$	--	--	2.3	Ω
		$V_{GS}=5V, I_D=0.05A$	--	--	2.7	Ω
V_{SD}	Diode Forward Voltage (Note 2)	$I_S = 115mA, V_{GS} = 0V$	--	--	1.4	V
g_{FS}	Forward Transconductance	$I_D=0.2A, V_{SD}=5V$	80	--	--	mS
Dynamic						
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1MHz$	--	25	50	pF
C_{oss}	Output Capacitance		--	5.5	25	
C_{rss}	Reverse Transfer Capacitance		--	3	5	
Q_g	Total Gate Charge	$V_{DS} = 10V, V_{GS} = 4.5V,$ $I_D = 0.5A$	--	0.71	--	nC
Q_{GS}	Gate-to-Source Charge		--	0.6	--	
Q_{GD}	Gate-to-Drain Charge		--	0.16	--	
$t_{d(on)}$	Turn-On Delay Time (Note 3)	$V_{DS} = 10V, I_D = 0.5A,$ $V_{EN} = 10V, R_G = 25\Omega$	--	1.5	10	ns
t_r	Turn-On Rise Time		--	22	10	
$t_{d(off)}$	Turn-Off Delay Time		--	3	40	
t_f	Turn-On Fall Time		--	22	30	

Note : 2. Pulse Test: pulse width $\leq 300 \mu s$, duty cycle $\leq 2\%$

3. Switching characteristics are independent of operating junction temperatures

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TYPICAL ELECTRICAL CHARACTERISTICS

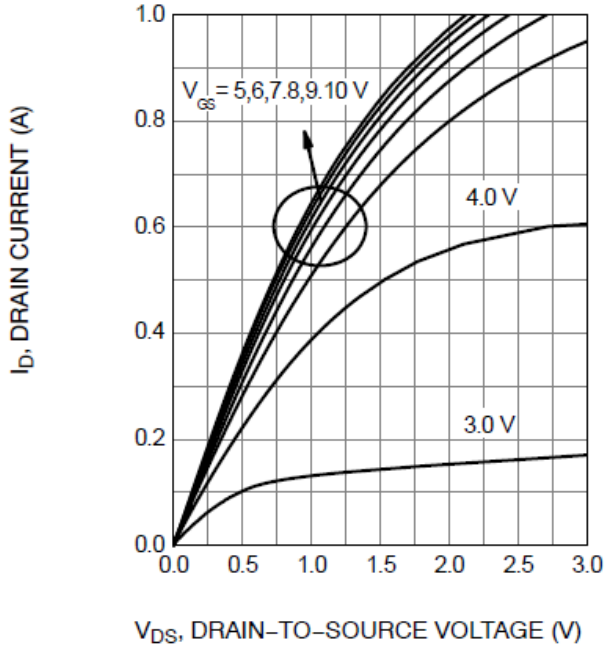


Figure 1. On-Region Characteristics

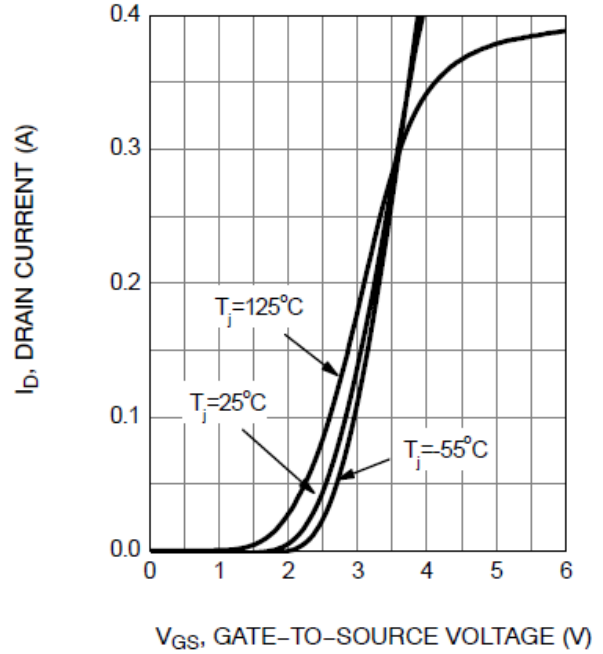


Figure 2. Transfer Characteristics

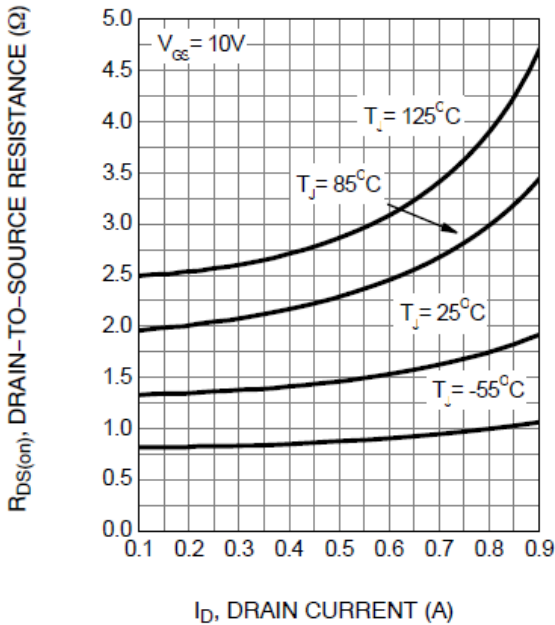


Figure 3. On-Resistance vs. Drain Current and Temperature

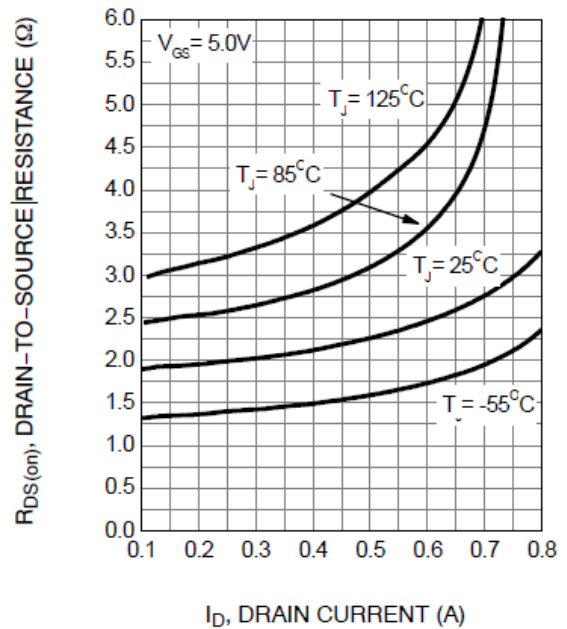


Figure 4. On-Resistance vs. Drain Current and Temperature

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TYPICAL ELECTRICAL CHARACTERISTICS

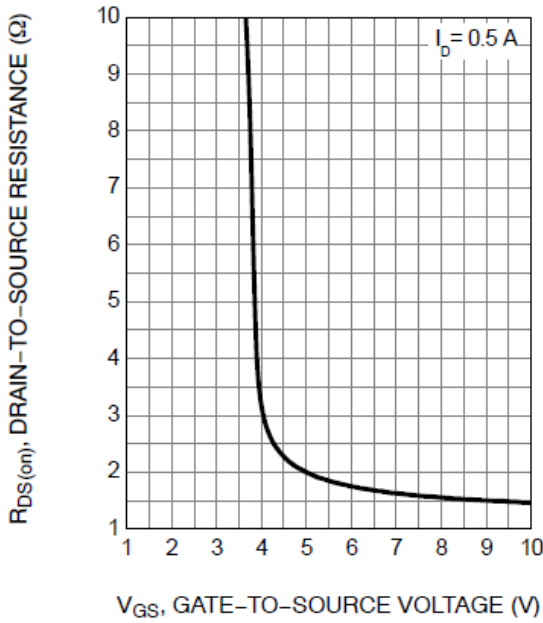


Figure 5. On-Resistance vs. Gate-to-Source Voltage

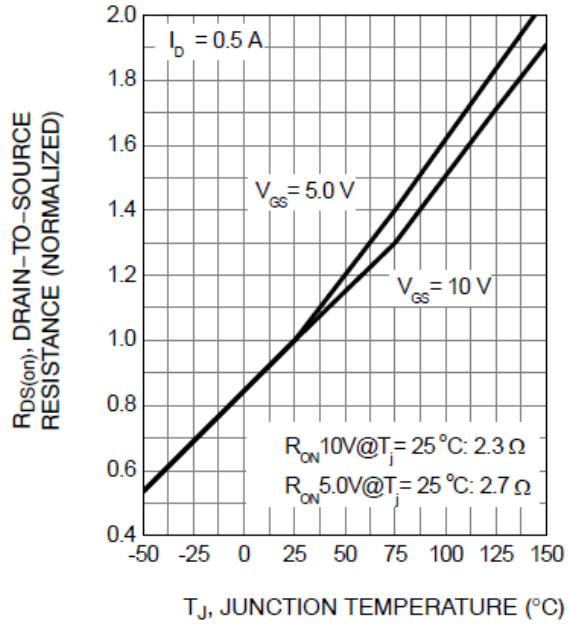


Figure 6. On-Resistance Variation with Temperature

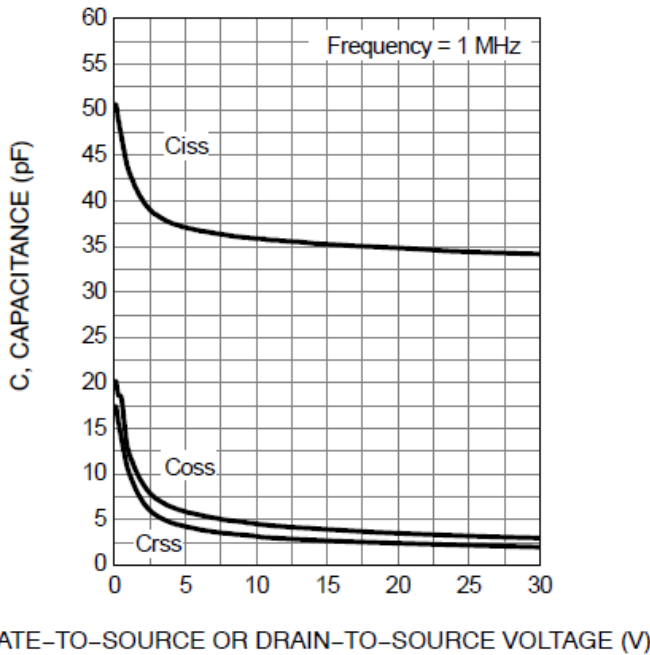


Figure 7. Capacitance Variation

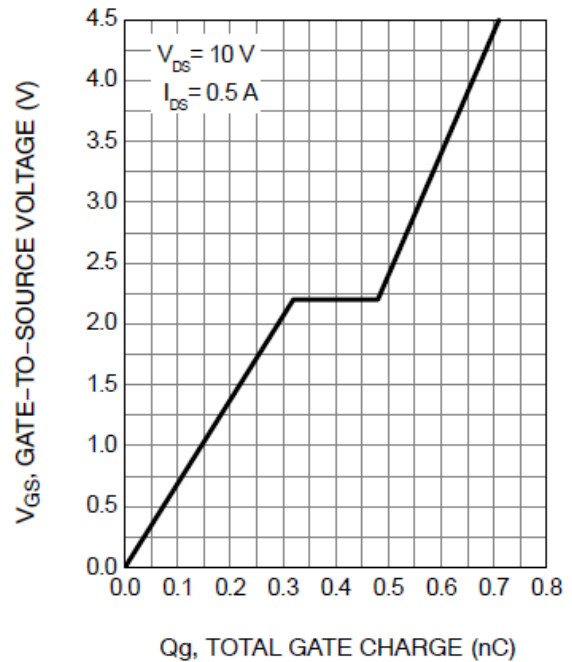
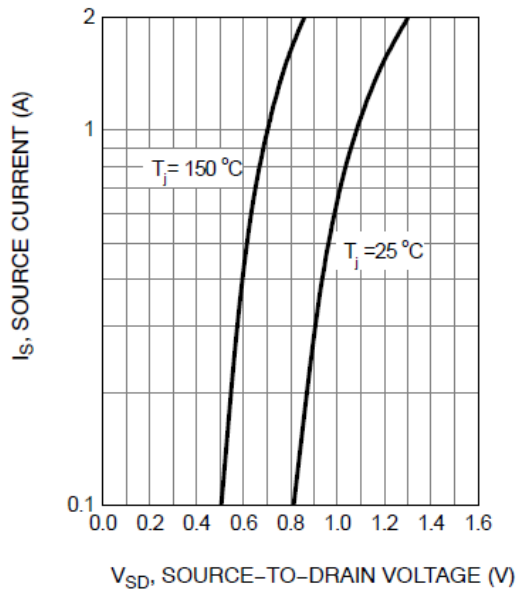
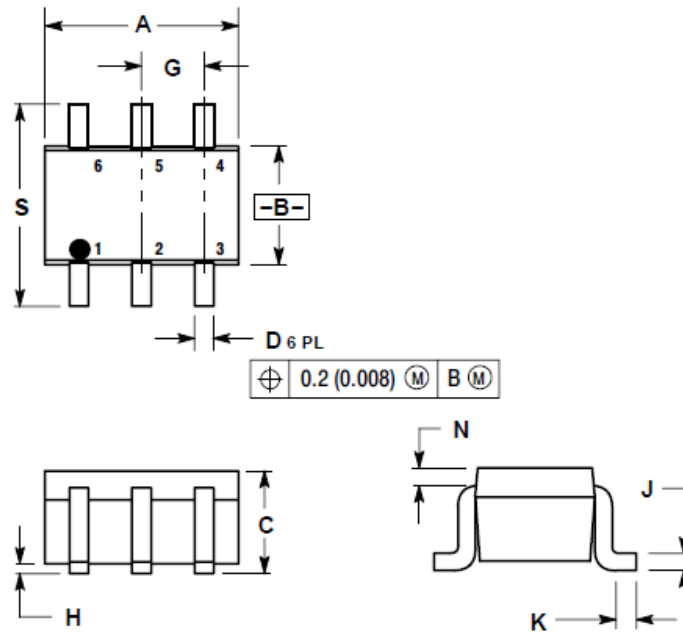


Figure 8. Gate-to-Source and Drain-to-Source Voltage vs. Total Charge

N-Channel 60V MOSFET**TYPICAL ELECTRICAL CHARACTERISTICS****Figure 9. Diode Forward Voltage vs. Current**

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Package Dimension : SOT-363



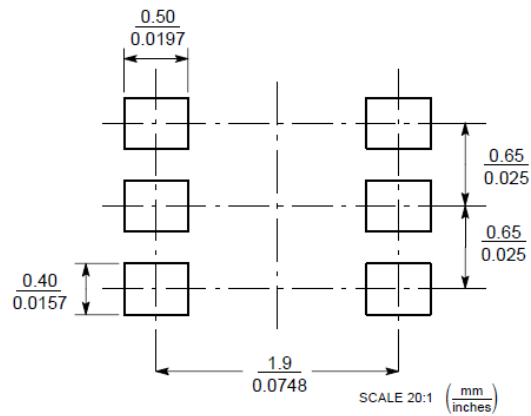
NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 419B-01 OBSOLETE, NEW STANDARD 419B-02.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.071	0.087	1.80	2.20
B	0.045	0.053	1.15	1.35
C	0.031	0.043	0.80	1.10
D	0.004	0.012	0.10	0.30
G	0.026 BSC		0.65 BSC	
H	---	0.004	---	0.10
J	0.004	0.010	0.10	0.25
K	0.004	0.012	0.10	0.30
N	0.008 REF	0.20 REF		
S	0.079	0.087	2.00	2.20

STYLE 1:

1. PIN 1. EMITTER 2
2. BASE 2
3. COLLECTOR 1
4. EMITTER 1
5. BASE 1
6. COLLECTOR 2



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