

Dual N-Channel 60V(D-S) MOSFET

Product summary		
V_{DS}	60	V
$R_{DS(ON)}$ (at $V_{GS}=10V$) Max.	2.0	Ω
$R_{DS(ON)}$ (at $V_{GS}=4.5V$) Max.	3.0	Ω
I_D ($T_A=25^\circ C$)	0.3	A

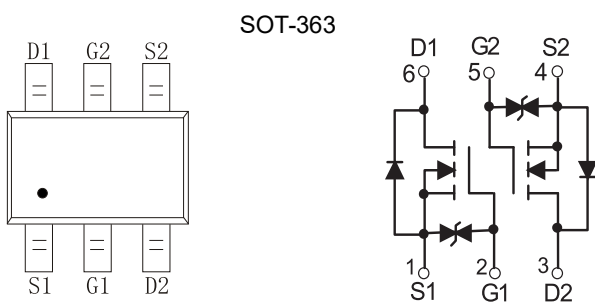
Features

- Low input Capacitance
- Trench Power MV MOSFET technology
- ESD Protection

Applications

- Small signal application
- Load switch

Pin Configuration



Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
2N7002KDW	SOT-363	7"	3000pcs

Absolute Maximum Ratings (at $T_A=25^\circ C$ Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current ^A	$T_A=25^\circ C$	0.30
		$T_A=70^\circ C$	0.24
I_{DM}	Pulse Drain Current Tested ^B	0.81	A
P_D	Power Dissipation ^A	$T_A=25^\circ C$	0.30
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JA}$	Thermal Resistance-Junction to ambient ^A	417	$^\circ C/W$

Electrical Characteristics (at $T_J = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=48V, V_{GS}=0V$	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	--	--	± 10	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.6	2.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance ^B	$V_{GS}=10V, I_D=0.3A$	--	--	2.0	Ω
		$V_{GS}=4.5V, I_D=0.25A$	--	--	3.0	Ω
V_{SD}	Diode Forward Voltage	$I_{SD}=0.3A, V_{GS}=0V$	--	--	1.2	V
Dynamic Parameters ^C						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=30V$ $f=1\text{MHz}$	--	26.2	--	pF
C_{oss}	Output Capacitance		--	2.7	--	pF
C_{rss}	Reverse Transfer Capacitance		--	1.7	--	pF
Q_g	Total Gate Charge	$V_{DS}=30V, I_D=0.3A$ $V_{GS}=4.5V$	--	0.9	--	nC
Q_g	Total Gate Charge	$V_{DS}=30V, I_D=0.3A$ $V_{GS}=10V$	--	1.7	--	nC
Q_{gs}	Gate-Source Charge		--	0.4	--	nC
Q_{gd}	Gate-Drain Charge		--	0.3	--	nC
$t_{D(on)}$	Turn-on Delay Time	$V_{DD}=30V$ $I_D=0.3A, R_{GEN}=10\Omega$ $, V_{GS}=10V$	--	1.0	--	ns
t_r	Turn-on Rise Time		--	19.4	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	23.2	--	ns
t_f	Turn-off Fall Time		--	21	--	ns

A. The data tested by surface mounted on a 1 inch x 1 inch FR-4 board with 2OZ copper.

B. Pulse Test: Pulse Width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

C. Guaranteed by design, not subject to production testing.

Typical Characteristics

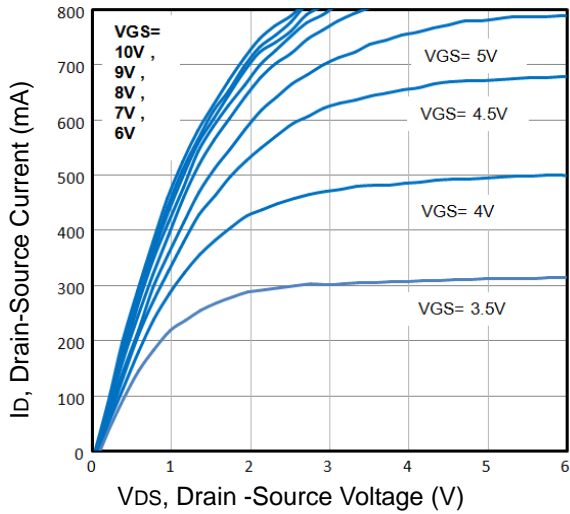


Fig1. Typical Output Characteristics

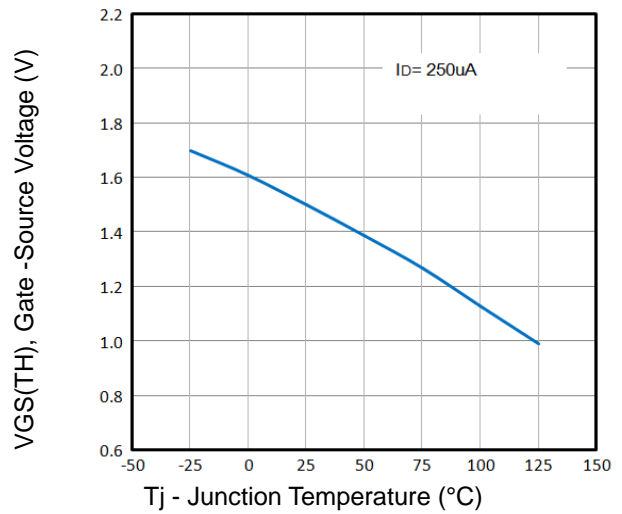


Fig2. Normalized Threshold Voltage Vs. Temperature

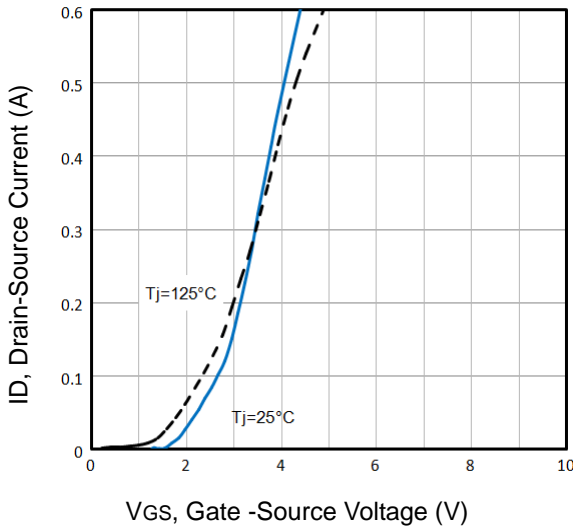


Fig3. Typical Transfer Characteristics

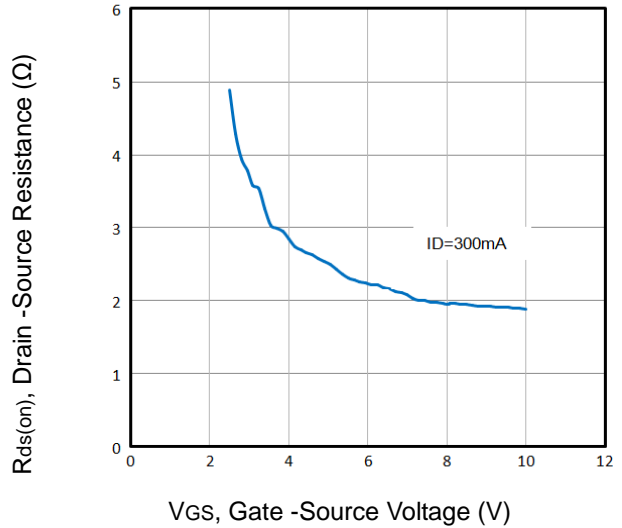


Fig4. Rds(on) vs Gate-Source Voltage

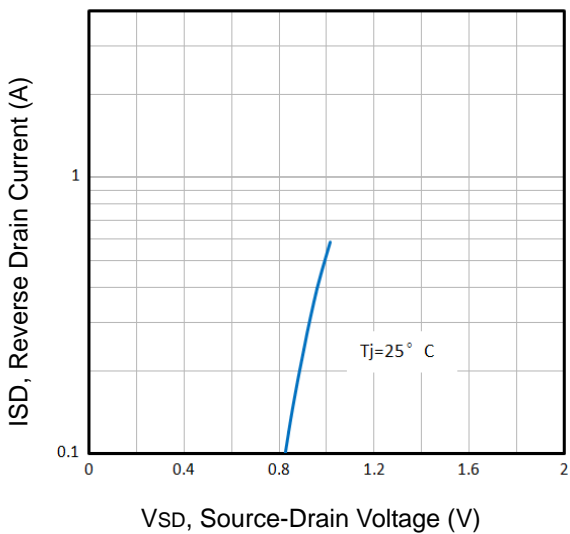


Fig5. Typical Source-Drain Diode Forward Voltage

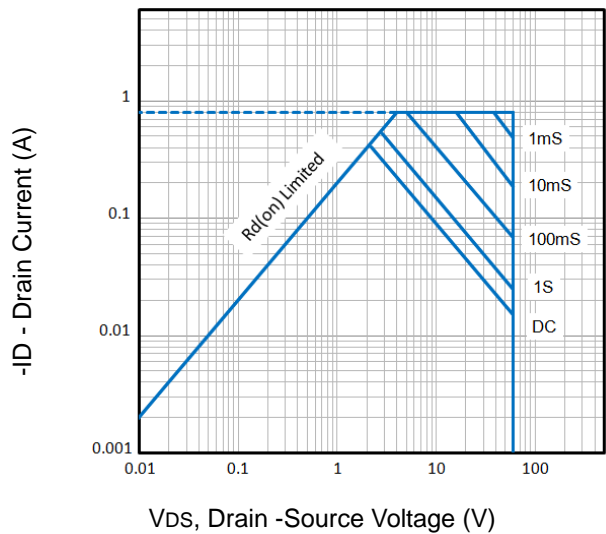


Fig6. Maximum Safe Operating Area

Typical Characteristics

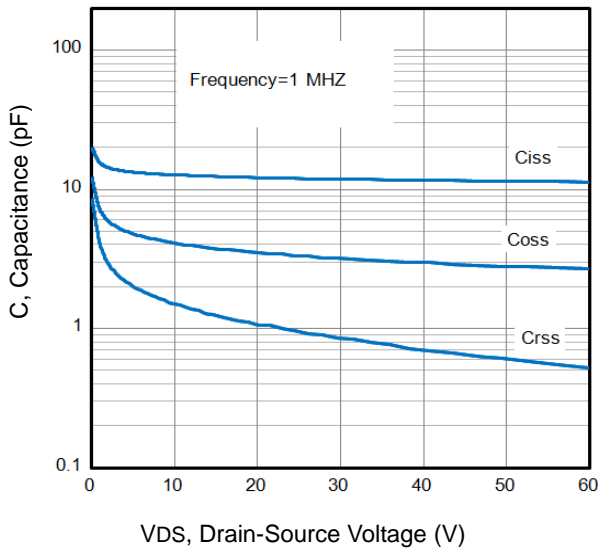


Fig7. Typical Capacitance Vs. Drain-Source Voltage

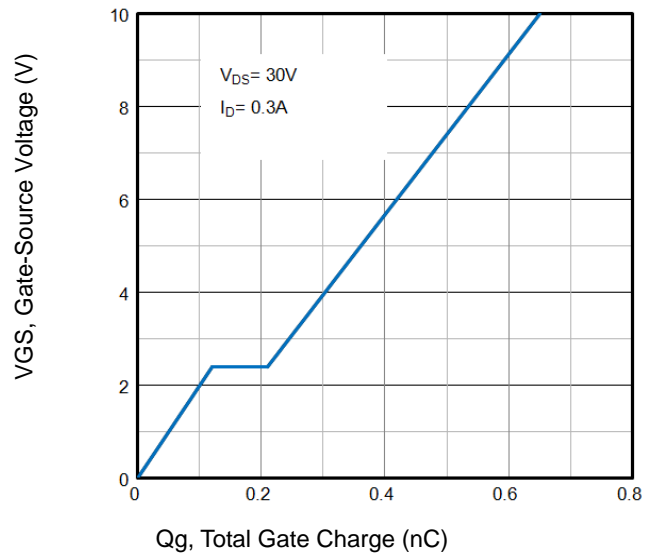


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

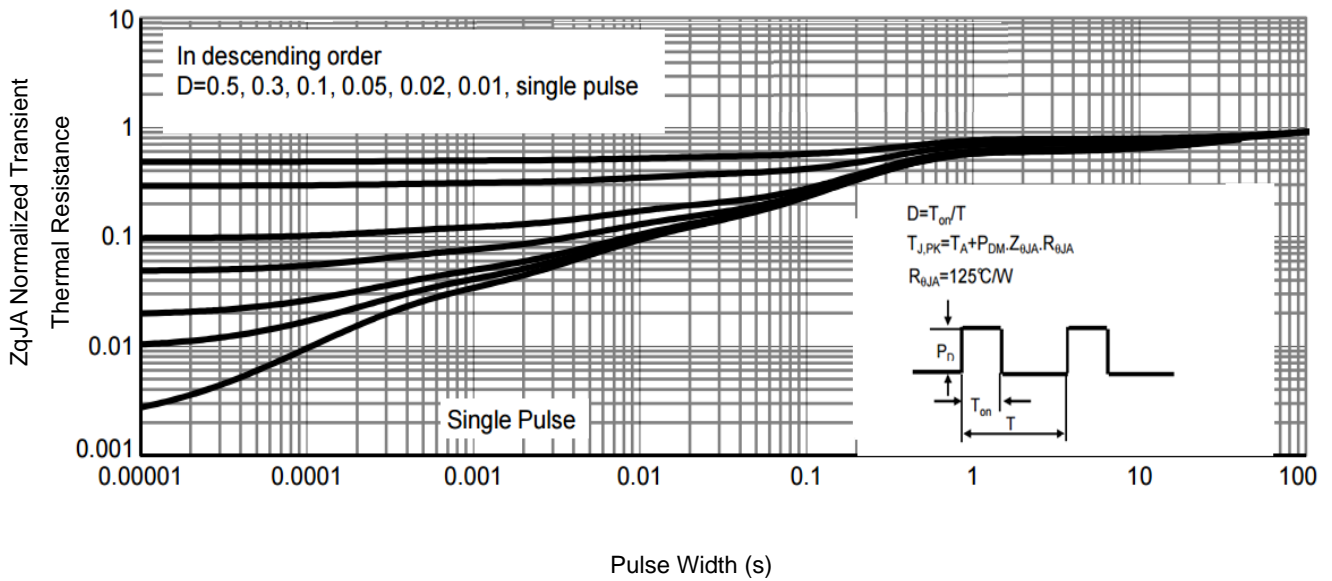
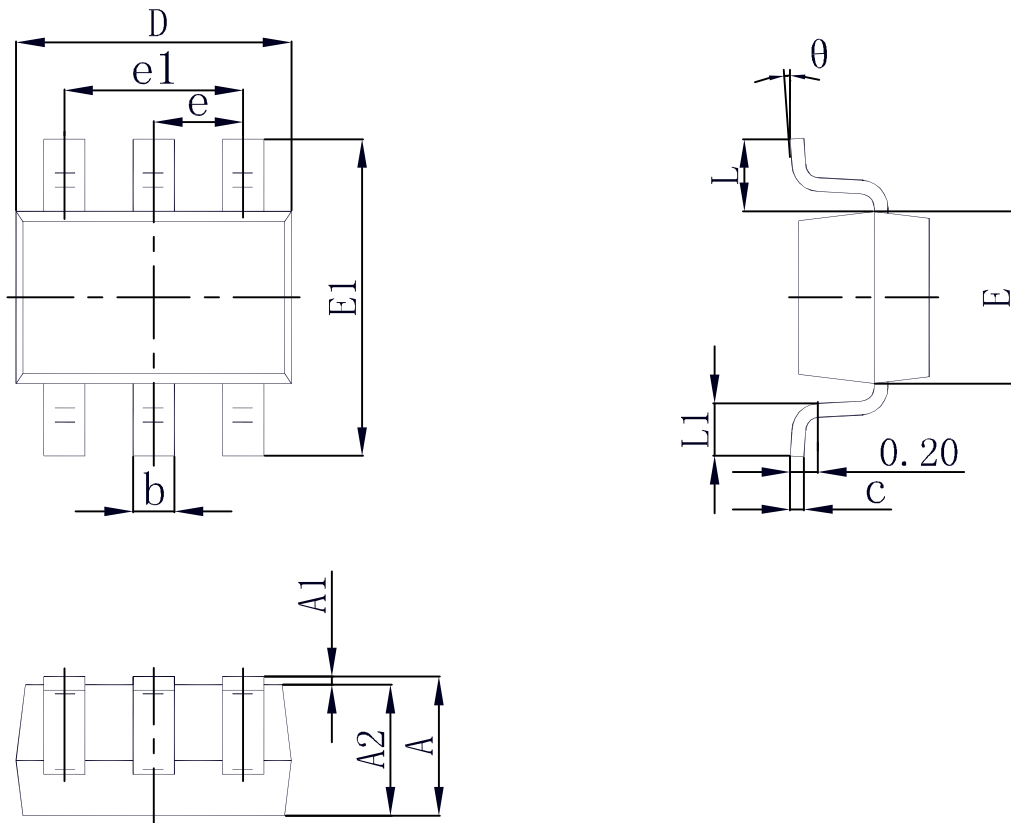


Fig9. Normalized Maximum Transient Thermal Impedance

SOT-363 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.100	0.150	0.004	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.400	0.085	0.094
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°