



Dual N-channel MOSFET

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	3Ω@10V	300mA
	4Ω@4.5V	

FEATURE

- High density cell design for Low $R_{DS(on)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability
- ESD protected

APPLICATION

- Load Switch for Portable Devices
- DC/DC Converter

Order Information

Product	Package	Packing
2N7002KDW	SOT-363	3000PCS/Reel

MOSFET MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source voltage	60	V
V_{GS}	Gate-Source voltage	±20	V
I_D	Drain Current	300	mA
P_D	Power Dissipation	0.15	W
T_J	Junction Temperature	150	°C
T_{stg}	Storage Temperature	-55-150	°C
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	833	°C/W

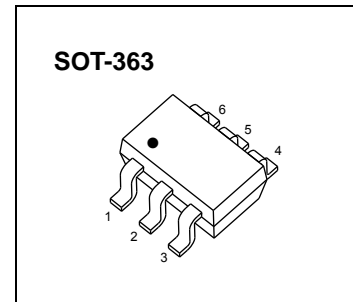
$T_a = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Static Characteristics						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0V, I_D = 250\mu A$	60			V
Gate Threshold Voltage*	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.7	1.3	2.5	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 48V, V_{GS} = 0V$			1	μA
Gate -Source leakage current	I_{GSS1}	$V_{GS} = \pm 20V, V_{DS} = 0V$			±10	μA
Drain-Source On-Resistance*	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 200mA$		1.3	4	Ω
		$V_{GS} = 10V, I_D = 500mA$		1	3	Ω
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 300mA$			1.5	V
Recovered charge	Q_r	$V_{GS} = 0V, I_S = 300mA, V_R = 25V, di/dt = -100A/\mu s$		30		nC
Dynamic Characteristics**						
Input Capacitance	C_{iss}	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$			40	pF
Output Capacitance	C_{oss}				30	pF
Reverse Transfer Capacitance	C_{rss}				10	pF
Switching Characteristics**						
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DD} = 50V, R_G = 50\Omega, R_{GS} = 50\Omega, R_L = 250\Omega$			10	ns
Turn-Off Delay Time	$t_{d(off)}$				15	ns
Reverse recovery Time	t_{rr}	$V_{GS} = 0V, I_S = 300mA, V_R = 25V, di/dt = -100A/\mu s$		30		ns
GATE-SOURCE ZENER DIODE						
Gate-Source Breakdown Voltage	BV_{GSO}	$I_{GS} = \pm 1mA$ (Open Drain)	±21.5		±30	V

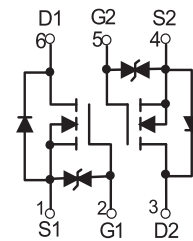
Notes :

*Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

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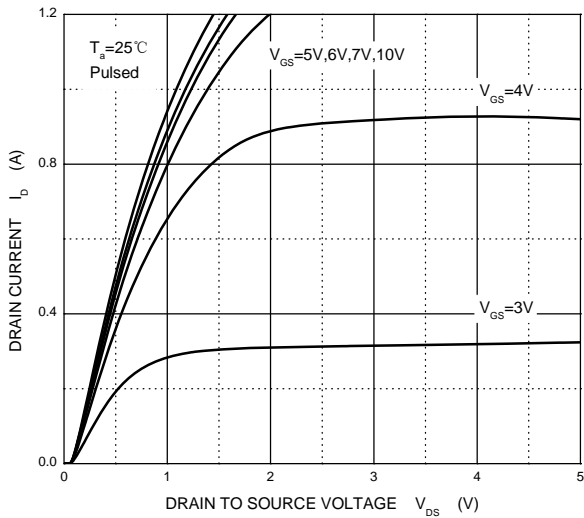
Equivalent Circuit



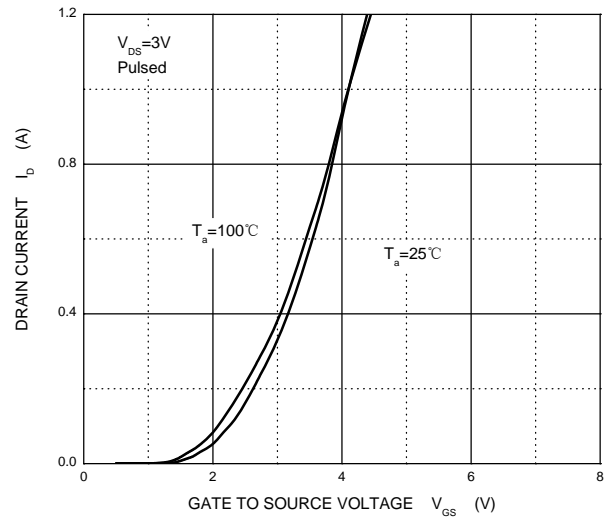


Dual N-channel MOSFET Typical Characteristics

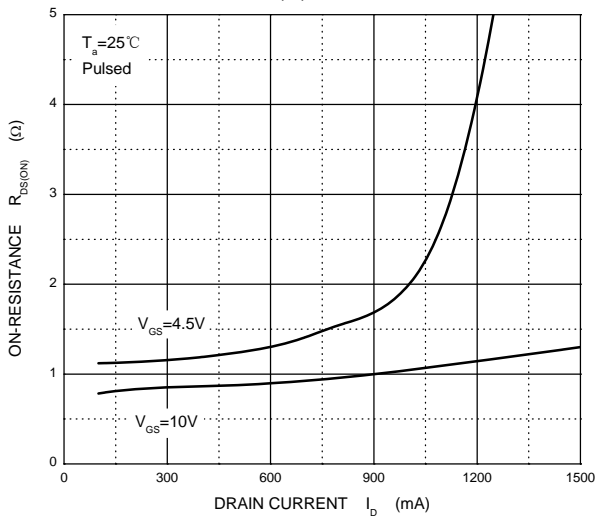
Output Characteristics



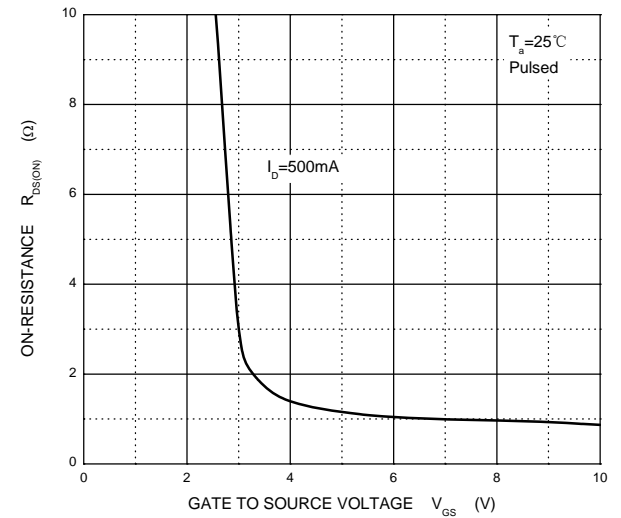
Transfer Characteristics



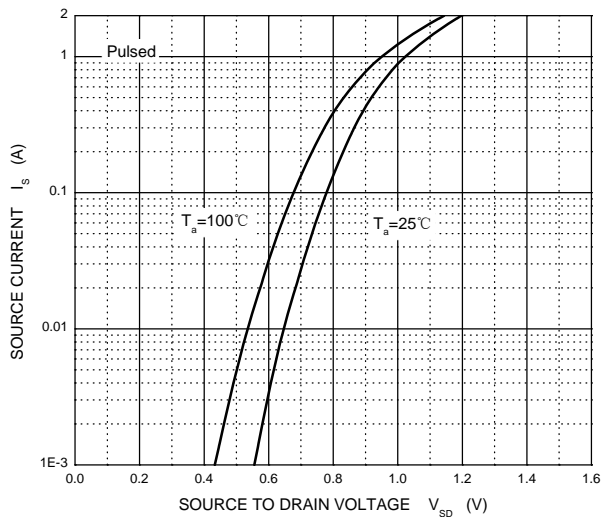
$R_{DS(ON)}$ — I_D



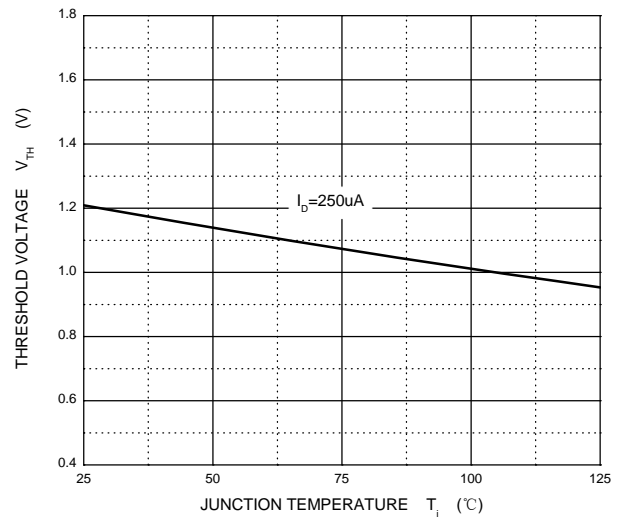
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}

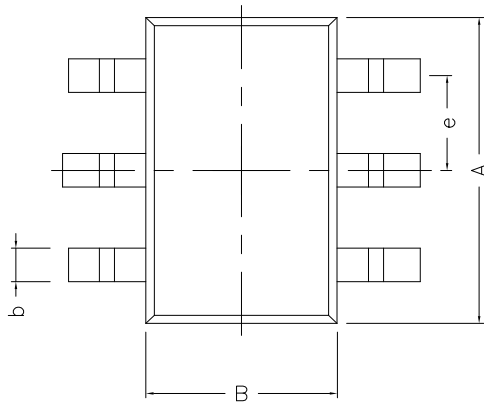


Threshold Voltage

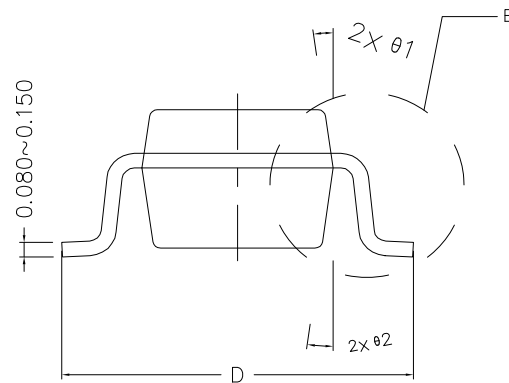


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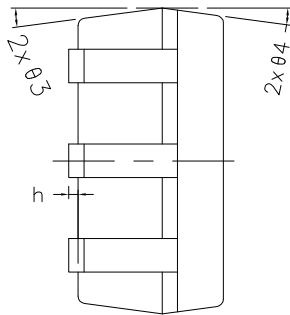
SOT-363 Package Outline Dimensions



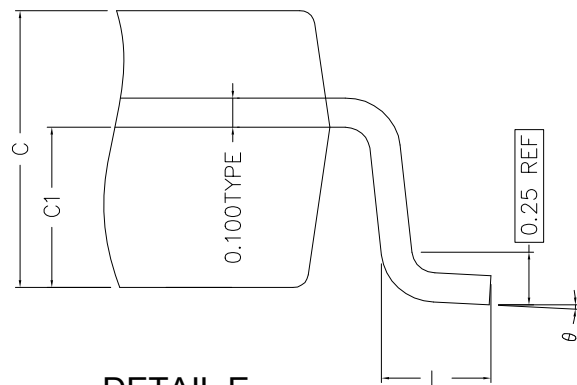
TOP VIEW



SIDE VIEW



SIDE VIEW



DETAIL E

COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A	2.000	2.100	2.200
B	1.150	1.250	1.350
C	0.900	0.950	1.000
C1	0.500	0.550	0.600
D	2.100	2.300	2.500
L	0.220	0.360	0.500
b	0.200	0.250	0.400
h	0.020	0.050	0.100
e	0.650 TYPE		
θ ₁	8° TYPE		
θ ₂	8° TYPE		
θ ₃	8° TYPE		
θ ₄	8° TYPE		
θ	0~8° TYPE		