

Small Signal MOSFET 380mAmps, 60 Volts N–Channel

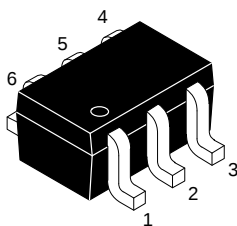
FEATURES:

- ESD Protected
- We declare that the material of product compliance with RoHS requirements and Halogen Free.

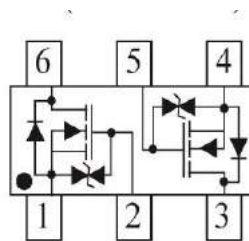
APPLICATIONS:

- Low Side Load Switch
- Level Shift Circuits
- DC–DC Converter

Circuit Diagram & Pin Configuration:



SOT363/SC-88



DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Shipping
2N7002KDW1-S03T	72K	3000/Tape&Reel

MAXIMUM RATINGS(Ta = 25°C)

Parameter	Symbol	Limits	Unit
Drain–Source Voltage	VDSS	60	Vdc
Gate–Source Voltage	VGS	±20	Vdc
Drain Current	ID		mAdc
– Steady State TA = 25°C		320	
TA = 85°C		230	
– t<5s TA = 25°C		380	
TA = 85°C		270	
Pulsed Drain Current (tp=10μs)	IDM	1.5	A
Source Current (Body Diode)	IS	300	mA

THERMAL CHARACTERISTICS

Parameter	Symbol	Limits	Unit
Total Device Dissipation(Note 1) – Steady State – t<5s	PD	300 420	mW
Junction-to-Ambient(Note 1) – Steady State – t<5s	R θ JA	417 300	°C/W
Lead Temperature for Soldering Purposes (1/8 " from case for 10 s)	TL	260	°C
Junction and Storage temperature	TJ,Tstg	-55~+150	°C
Gate-Source ESD Rating(HBM, Method 3015)	ESD	2000	V

1. FR-5 = 1.0×0.75×0.062 in.

ELECTRICAL CHARACTERISTICS (Ta= 25°C)
OFF CHARACTERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain–Source Breakdown Voltage (VGS = 0, ID = 250μAdc)	VBRDSS	60	-	-	Vdc
Drain–to–Source Breakdown Voltage Temperature Coefficient	VBRDSS/TJ	-	71	-	mV/°C
Zero Gate Voltage Drain Current (VGS = 0, VDS = 60 Vdc) TJ = 25°C	IDSS	-	-	1.0	μAdc
TJ = 125°C		-	-	500	
(VGS = 0, VDS = 50 Vdc) TJ = 25°C		-	-	100	nAdc
Gate–Body Leakage Current, Forward (VGS = 20 Vdc)	IGSSF	-	-	10	μAdc
Gate–Body Leakage Current, Reverse (VGS = - 20 Vdc)	IGSSR	-	-	-10	μAdc

ON CHARACTERISTICS (Note 2)

Gate Threshold Voltage (VDS = VGS, ID = 250μAdc)	VGS(th)	1.0	-	2.5	Vdc
Negative Threshold Temperature Coefficient	VGS(TH)/TJ	-	4	-	mV/°C
Static Drain–Source On–State Resistance (VGS = 10 Vdc, ID = 500 mAdc)	RDS(on)	-	-	2.3	Ω
(VGS = 5.0 Vdc, ID = 50 mAdc)		-	-	2.7	
Forward Transconductance (VDS = 5.0 Vdc, ID = 200 mAdc)	gfs	80	-	-	mS

DYNAMIC CHARACTERISTICS

Input Capacitance (VDS = 25 Vdc, VGS = 0, f = 1.0 MHz)	Ciss	-	34	-	pF
Output Capacitance (VDS = 25 Vdc, VGS = 0, f = 1.0 MHz)	Coss	-	3	-	pF
Reverse Transfer Capacitance (VDS = 25 Vdc, VGS = 0, f = 1.0 MHz)	Crss	-	2.2	-	pF

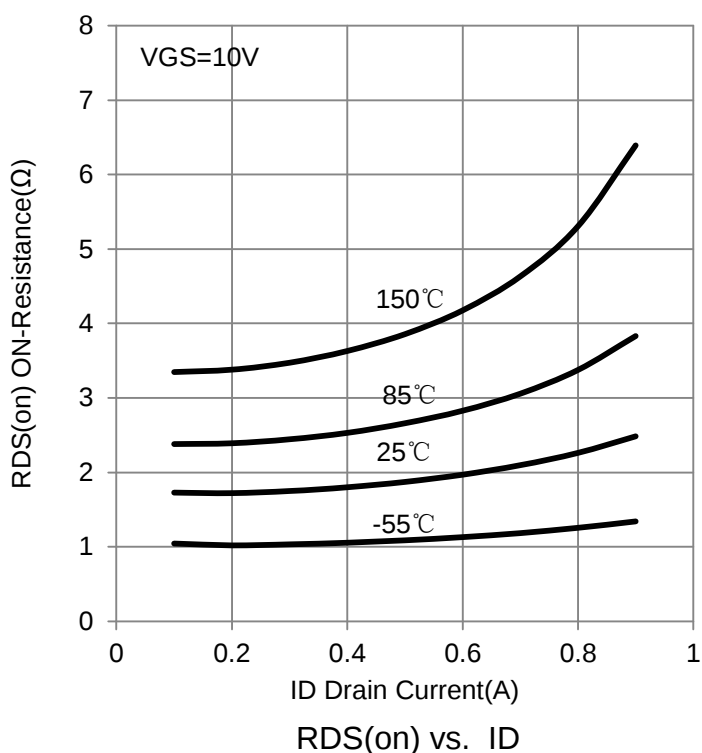
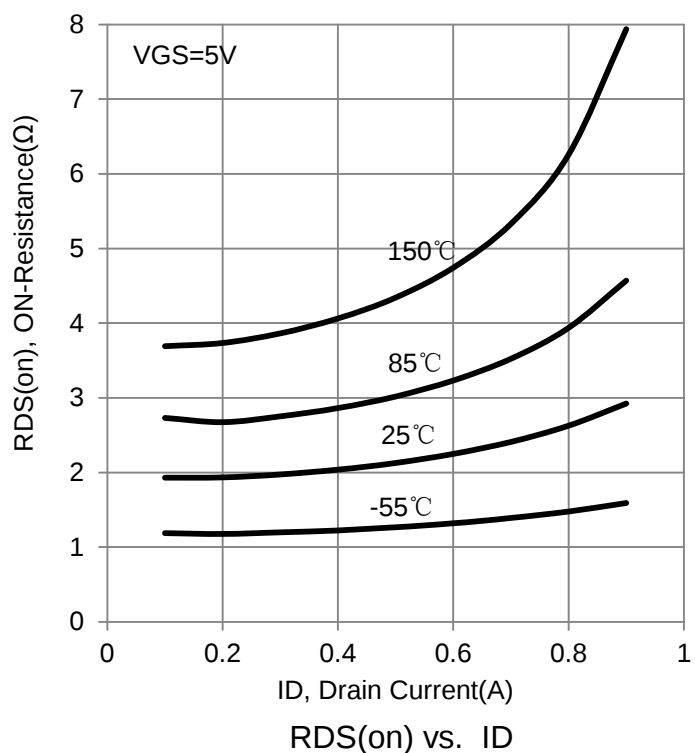
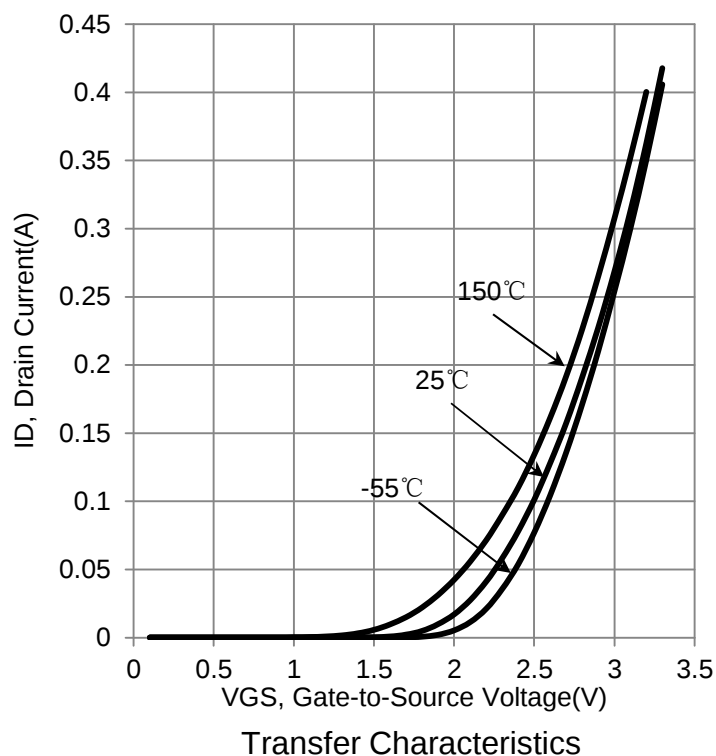
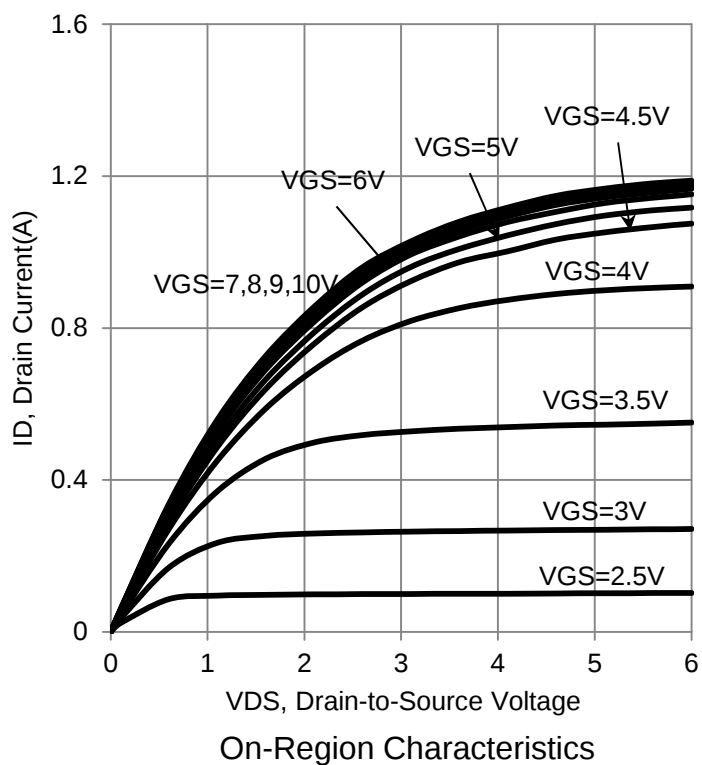
SWITCHING CHARACTERISTICS

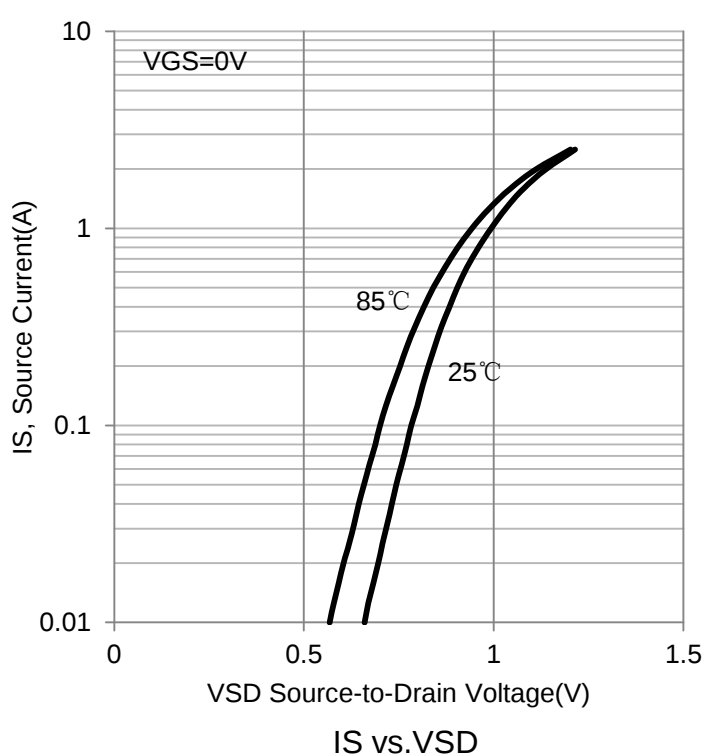
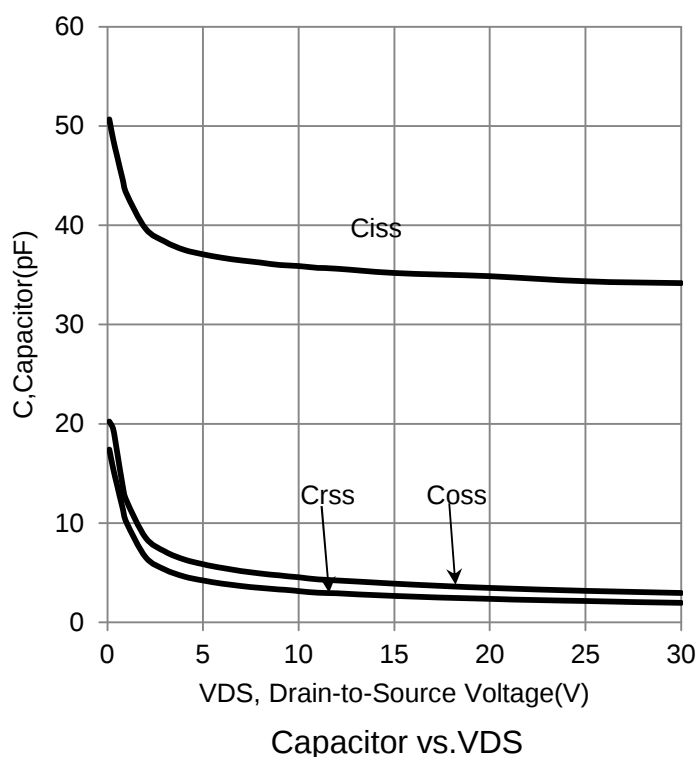
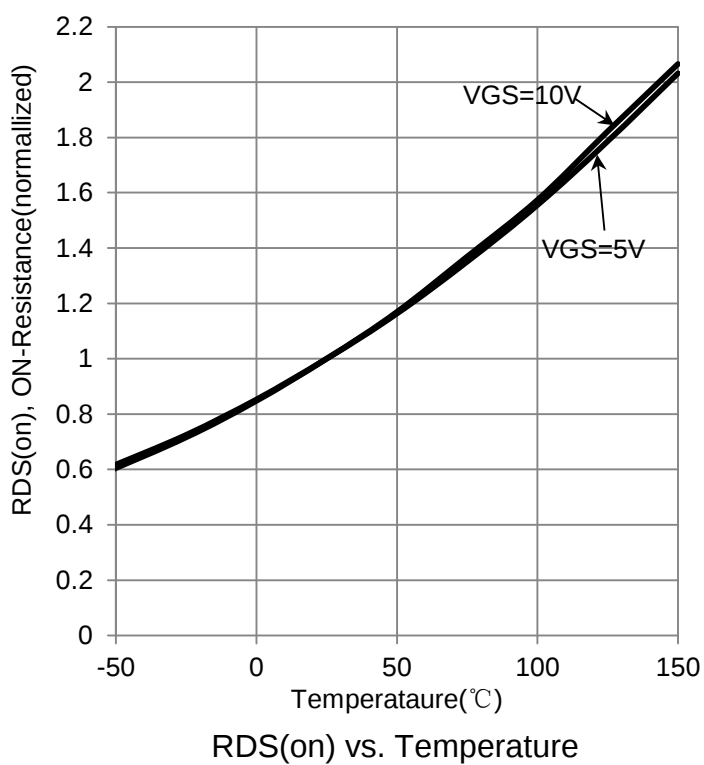
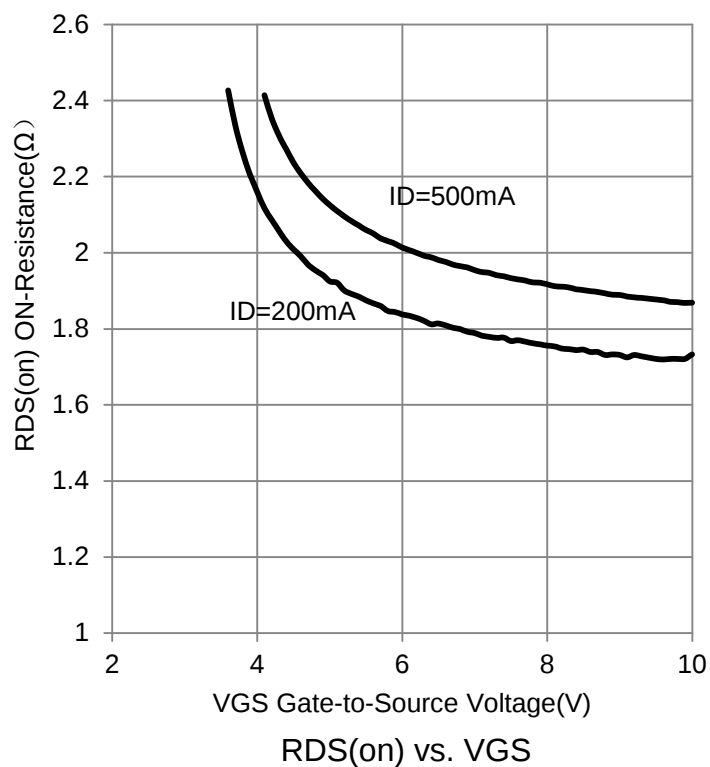
Turn-On Delay Time	VDS = 10 V, VGEN = 10 V, ID = 500 mA	td(on)	-	3.8	-	ns
Rise Time		tr	-	3.4	-	
Turn-Off Delay Time		td(off)	-	19	-	
Fall Time		tf	-	12	-	

BODY–DRAIN DIODE RATINGS

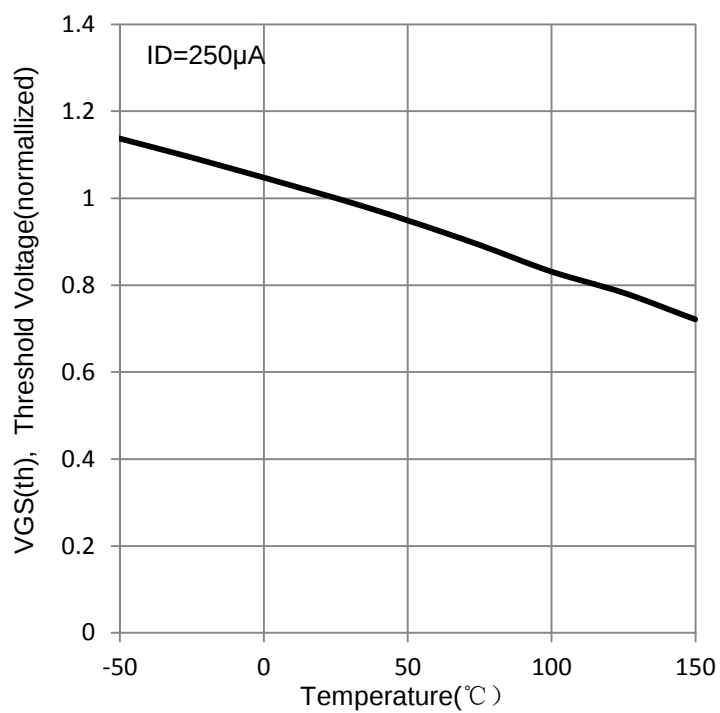
Diode Forward On–Voltage (IS = 115 mAdc, VGS = 0 V) TJ = 25°C	VSD	-	-	1.4	Vdc
TJ = 85°C		-	0.7	-	

2. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

ELECTRICAL CHARACTERISTICS CURVES


ELECTRICAL CHARACTERISTICS CURVES (Con.)


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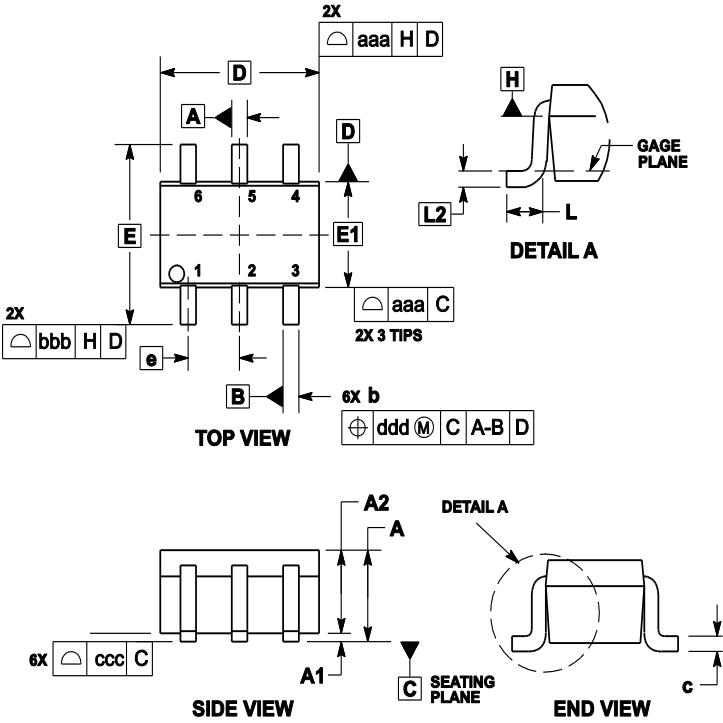


V_{GS(th)} vs. Temperature

OUTLINE AND DIMENSIONS

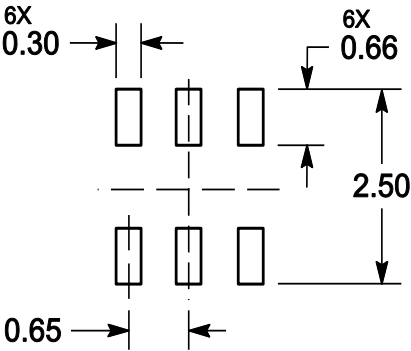
Notes:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.



DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	---	---	1.10	---	---	0.043
A1	0.00	---	0.10	0	---	0.004
A2	0.70	0.90	1.00	0.027	0.035	0.039
b	0.15	0.20	0.25	0.006	0.008	0.01
C	0.08	0.15	0.22	0.003	0.006	0.009
D	1.80	2.00	2.20	0.07	0.078	0.086
E	2.00	2.10	2.20	0.078	0.082	0.086
E1	1.15	1.25	1.35	0.045	0.049	0.053
e	0.65 BSC			0.026 BSC		
L	0.26	0.36	0.46	0.010	0.014	0.018
L2	0.15 BSC			0.006 BSC		
aaa	0.15			0.01		
bbb	0.30			0.01		
ccc	0.10			0.00		
ddd	0.10			0.00		

SOLDERING FOOTPRINT



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