

# DN2102W

## DN2102W N-Channel Enhancement Mode Field Effect Transistor

### General description

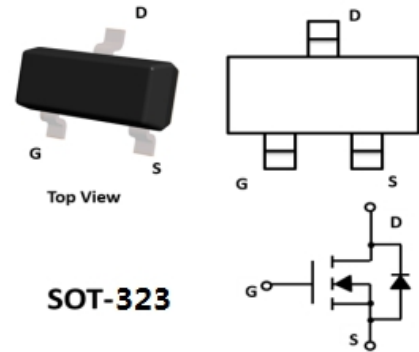
N-Channel Enhancement Mode Field Effect Transistor

### Features:

- $V_{DS}$  : 20V
- $I_D$  : 2.0A
- $R_{DS(ON)}$ ( at  $V_{GS}=4.5V$ ) < 68 mohm
- $R_{DS(ON)}$ ( at  $V_{GS}=2.5V$ ) < 115 mohm
- Trench Power LV MOSFET technology
- High Power and current handing capability

### Applications

- PWM application
- Load switch



Device Marking Code:

Device Type	Device Marking
DN2102W	TS2

### Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source Voltage	$V_{DS}$	20	V
Gate-source Voltage	$V_{GS}$	$\pm 8$	V
Drain Current	$I_D$	2.0	A
Pulsed Drain Current <sup>A</sup>	$I_{DM}$	14	A
Total Power Dissipation @ $T_A=25^\circ\text{C}$	$P_D$	0.7	W
Thermal Resistance Junction-to-Ambient @ Steady State <sup>B</sup>	$R_{\theta JA}$	178	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 ~ +150	$^\circ\text{C}$

## Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	20			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, T <sub>C</sub> =25°C			1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±10V, V <sub>DS</sub> =0V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	0.45	0.75	1.2	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> =2.0A		50	68	mΩ
		V <sub>GS</sub> = 2.5V, I <sub>D</sub> =1.5A		65	115	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =2.0A, V <sub>GS</sub> =0V			1.2	V
Maximum Body-Diode Continuous Current	I <sub>S</sub>				2.0	A
<b>Dynamic Parameters</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHZ		280		pF
Output Capacitance	C <sub>oss</sub>			46		
Reverse Transfer Capacitance	C <sub>rss</sub>			29		
<b>Switching Parameters</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, I <sub>D</sub> =4.3A		2.9		nC
Gate Source Charge	Q <sub>gs</sub>			0.4		
Gate Drain Charge	Q <sub>gd</sub>			0.6		
Turn-on Delay Time	t <sub>D(on)</sub>	V <sub>GS</sub> =4.5V, V <sub>DD</sub> =10V, R <sub>L</sub> =1.5Ω, R <sub>GEN</sub> =3Ω		13		ns
Turn-on Rise Time	t <sub>r</sub>			54		
Turn-off Delay Time	t <sub>D(off)</sub>			18		
Turn-off Fall Time	t <sub>f</sub>			11		

A.Pulse Test: Pulse Width ≤300us, Duty cycle ≤2%.

B.Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

## Typical Performance Characteristics

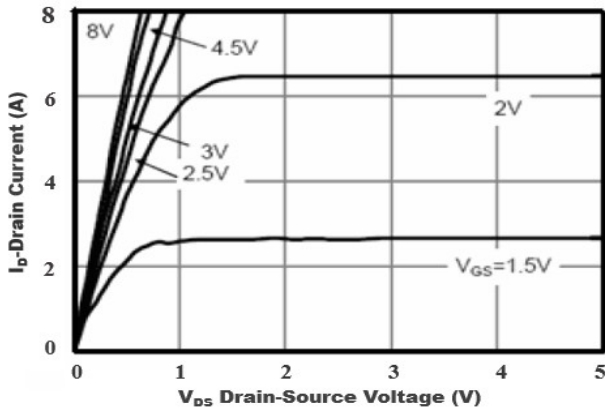


Figure1. Output Characteristics

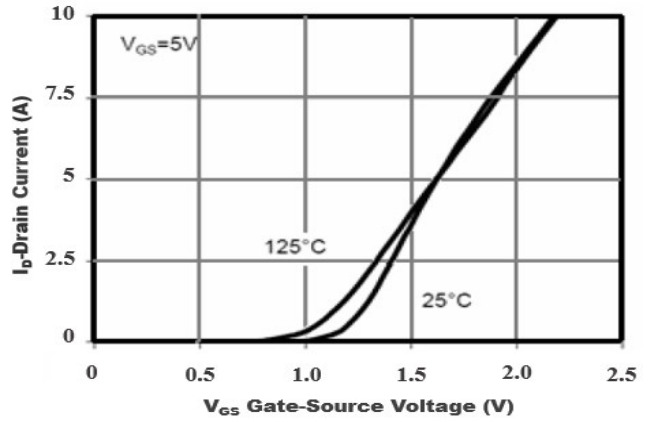


Figure2. Transfer Characteristics

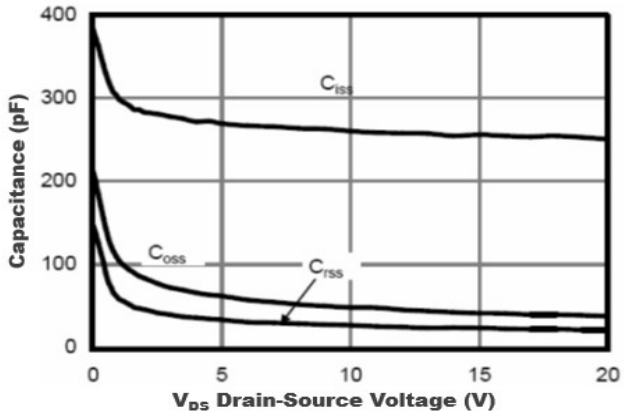


Figure3. Capacitance Characteristics

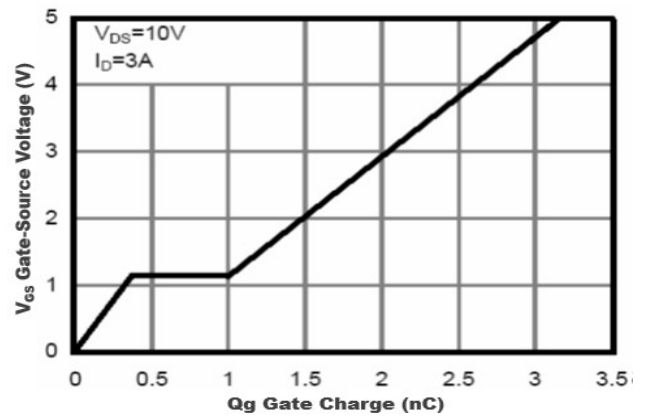


Figure4. Gate Charge

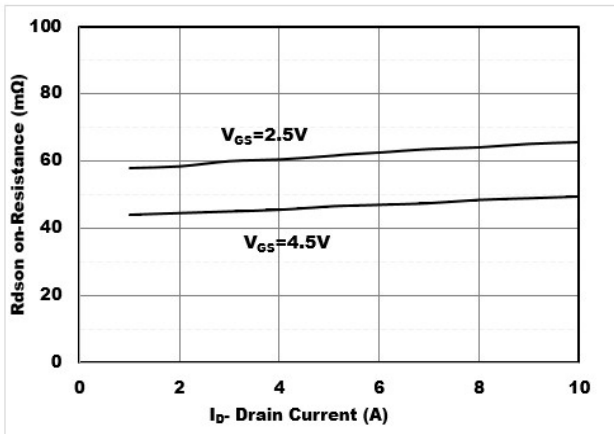


Figure5. Drain-Source on Resistance

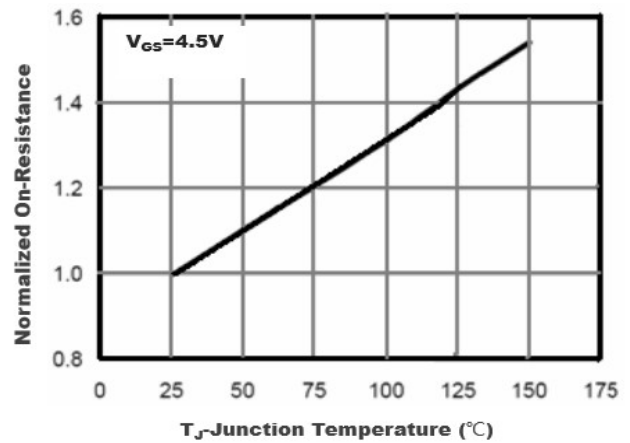
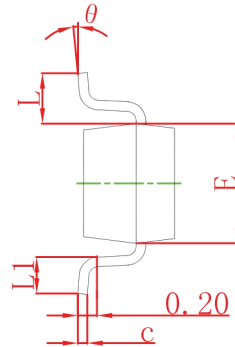
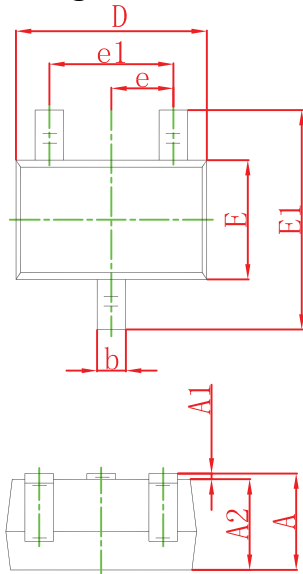
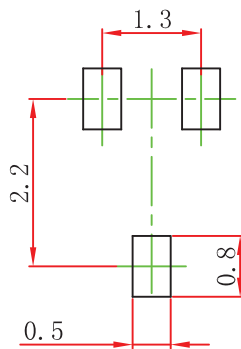


Figure6. Drain-Source on Resistance

## SOT-323 Package Outline



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	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
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
	0°	8°	0°	8°



**Note:**

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05$ mm.
3. The pad layout is for reference purposes only.

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