

## 8A 500V N-channel Enhancement Mode Power MOSFET

### 1 Description

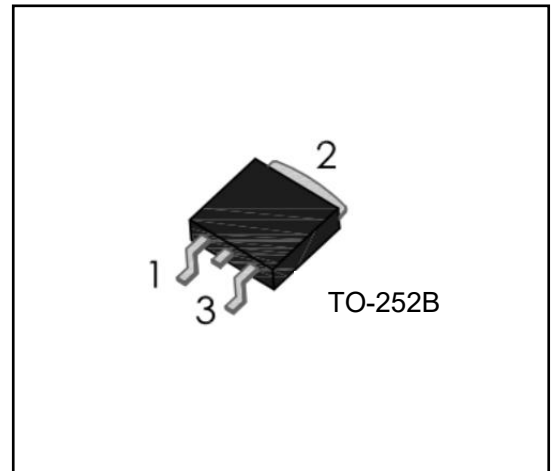
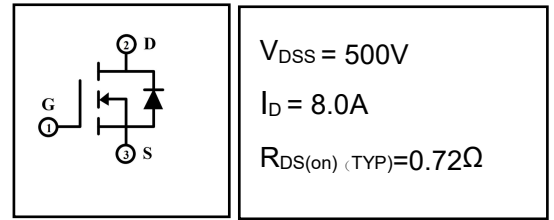
These N-channel enhanced vdmofets, is obtained by the self-aligned planar technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. Which accords with the RoHS standard.

### 2 Features

- Fast switching
- ESD improved capability
- Low on resistance( $R_{dson} \leq 0.9\Omega$ )
- Low gate charge(Typ: 24nC)
- Low reverse transfer capacitances(Typ: 7pF)
- 100% single pulse avalanche energy test
- 100%  $\Delta V_{DS}$  test

### 3 Applications

- Used in various power switching circuit for system miniaturization and higher efficiency.
- Power switch circuit of electron ballast and adaptor.



## 4 Electrical Characteristics

### 4.1 Absolute Maximum Ratings (Tc=25°C, unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Drain-Source Voltage	$V_{DS}$	500	V
Gate-Source Voltage	$V_{GS}$	$\pm 30$	V
Drain Current(continuous) <sup>(Note 3)</sup>	$I_D$	8	A
Drain Current(continuous)(T=100°C) <sup>(Note 3)</sup>	$I_D$	5	A
Drain Current(Pulsed)	$I_{DM}$	32	A
Single Pulse Avalanche Energy <sup>(Note 4)</sup>	$E_{AS}$	450	mJ
Derating Factor above	$P_D$	0.8	W
Power Dissipation			
		100	W
Operating Junction Temperature Range	$T_j$	-55 ~ 150	°C
Storage Temperature Range	$T_{stg}$	-55 ~ 150	°C
High Temperature(tin solder)	$T_L$	300	°C

### 4.2 Thermal Characteristics

PARAMETER	SYMBOL	VALUE	UNIT
Thermal Resistance, Junction to Case-sink	$R_{thJC}$	1.25	°C/W
Thermal Resistance, Junction to Ambient	$R_{thJA}$	62.5	°C/W

**4.3 Electrical Characteristics** (Tc=25°C, unless otherwise noted)

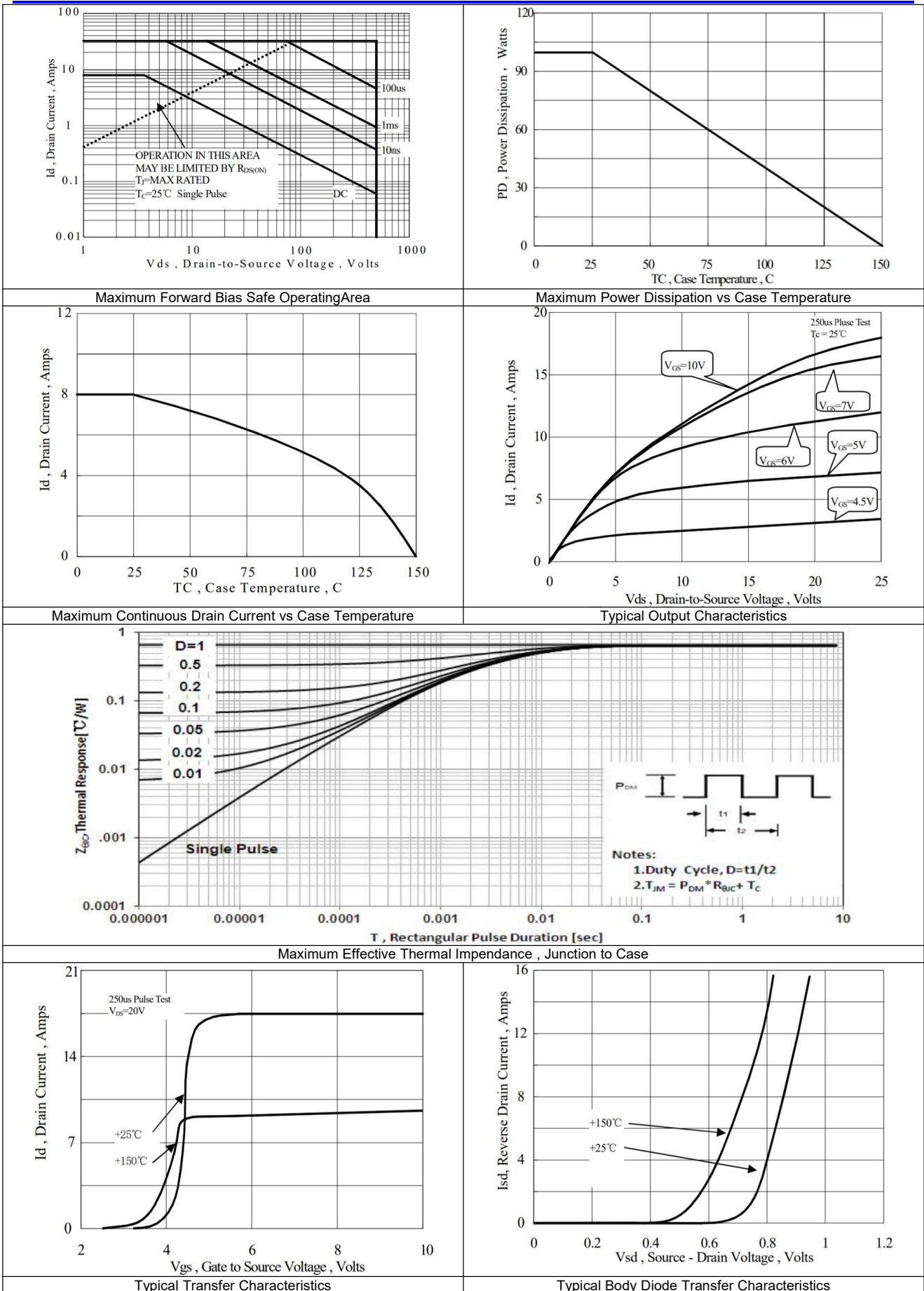
PARAMETER	SYMBOL	Test Condition	VALUE			UNIT
			MIN	TYP	MAX	
<b>Off Characteristics</b>						
Drain-source Breakdown Voltage	$BV_{DSS}$	$I_D=250\mu A, V_{GS}=0V$	500	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=500V, V_{GS}=0V, T_C=25^\circ C$	--	--	1	$\mu A$
		$V_{DS}=400V, V_{GS}=0V, T_C=125^\circ C$	--	--	100	$\mu A$
Gate-to-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 30V, V_{DS}=0V$	--	--	$\pm 100$	nA
<b>On Characteristics</b> (Note 3)						
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	--	4.0	V
Drain-source on Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=4.0A$	--	0.72	0.9	$\Omega$
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=25V, f=1.0MHz$	--	1121	--	pF
Output Capacitance	$C_{oss}$		--	110	--	
Reverse Transfer Capacitance	$C_{rss}$		--	7	--	
Turn-on Delay Time	$T_{d(on)}$	$I_D=8A, V_{DD}=250V, V_{GS}=10V, R_G=10\Omega$	--	18	--	ns
Turn-on Rise Time	$t_r$		--	20	--	
Turn-off Delay Time	$T_{d(off)}$		--	44	--	
Turn-off Fall	$t_f$		--	15	--	
Total Gate Charge	$Q_g$	$I_D=8A, V_{DD}=400V, V_{GS}=10V$	--	24	--	nC
Gate-to-Source Charge	$Q_{gs}$		--	5	--	
Gate-to-Drain("Miller")C harge	$Q_{gd}$		--	9	--	
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage (Note 3)	$V_{FSD}$	$V_{GS}=0V, I_S=8A$	--	--	1.5	V
Continuous Source Current (BodyDiode) (Note 3)	$I_S$		--	--	8	A
Reverse Recovery Time	$t_{rr}$	$T_J=25^\circ C, I_F=8A, dI_F/dt=100A/\mu S, V_{GS}=0V$	--	385	--	ns
Reverse Recovery Charge	$Q_{rr}$		--	1830	--	nC

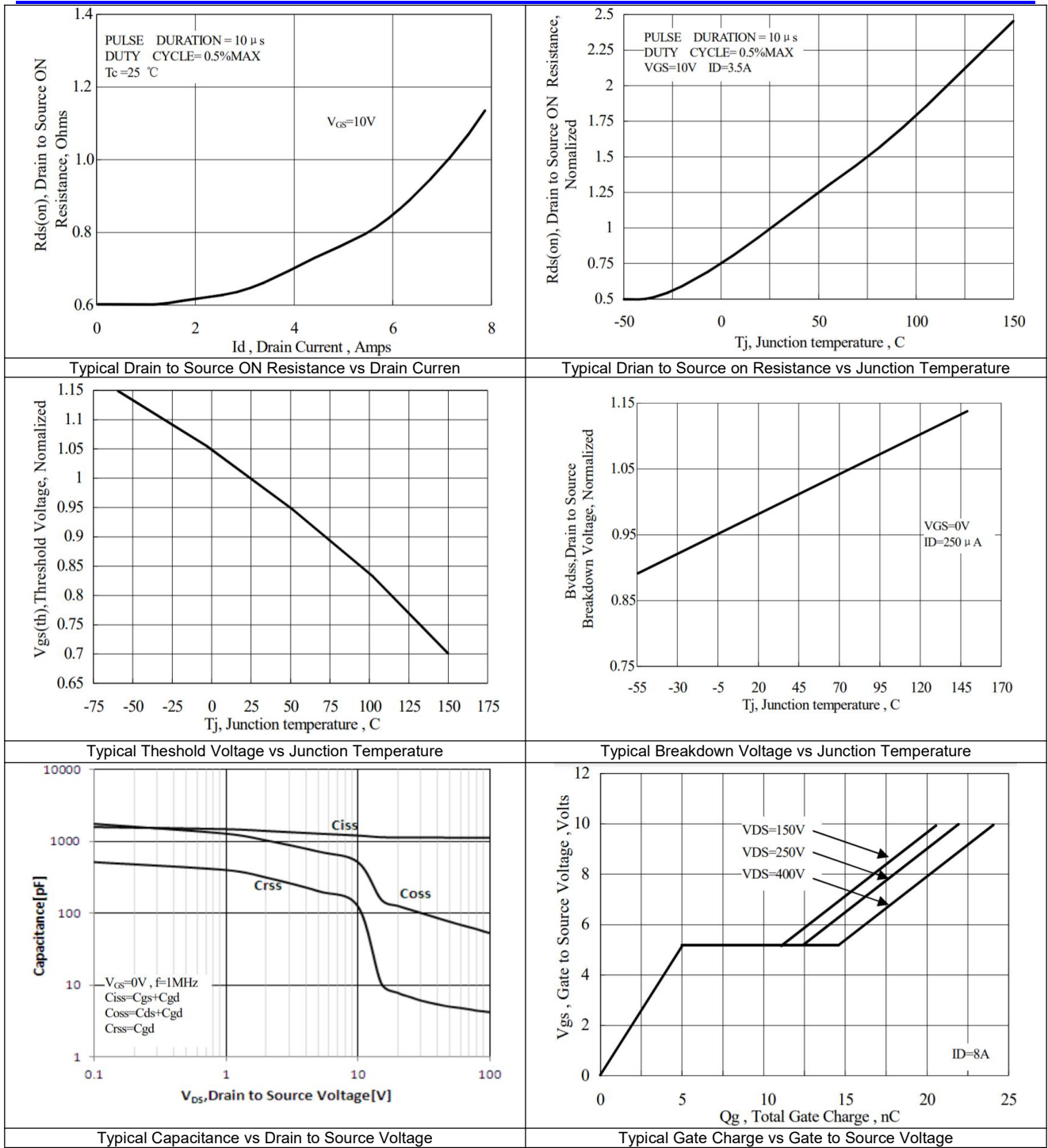
Notes:

- 1: Repetitive rating, pulse width limited by maximum junction temperature.
- 2: Surface mounted on FR4 Board,  $t_s \leq 10sec$ .
- 3: Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
- 4:  $L=10mH, I_D=9.5A, V_{DD}=50V, Start T_J=25^\circ C$ .

**5 Typical Test Circuit and Waveform**

<p style="text-align: center;">Gate Charge Test Circuit</p>	<p style="text-align: center;">Gate Charge Waveforms</p>
<p style="text-align: center;">Resistive Switching Test Circuit</p>	<p style="text-align: center;">Resistive Switching Waveforms</p>
<p style="text-align: center;">Diode Reverse Recovery Test Circuit</p>	<p style="text-align: center;">Diode Reverse Recovery Waveform</p> $E_{AS} = \frac{I_{AS}^2 L}{2}$
<p style="text-align: center;">Unclamped Inductive Switching Test Circuit</p>	<p style="text-align: center;">Unclamped Inductive Switching Waveform</p>



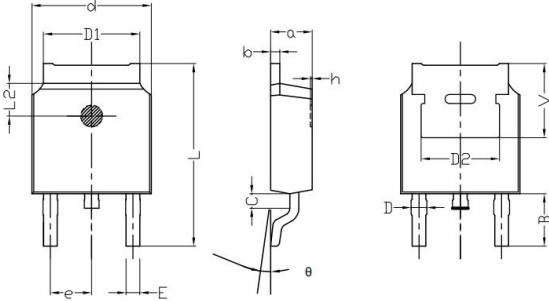


## 6 Product Specifications and Packaging Models

Product Model	Package Type	Mark Name	RoHS	Package	Quantity
D8N50	TO-252B	D8N50	Pb-free	Braid	2500/disc

**7 Dimensions**

**TO-252B PACKAGE OUTLINE DIMENSIONS**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
a	2.20	2.40	0.087	0.095
b	0.46	0.58	0.018	0.023
c	0.70	0.90	0.028	0.035
D	0.80	0.90	0.032	0.035
d	6.50	6.70	0.2561	0.2640
D1	5.10	5.46	0.201	0.215
D2	4.73	4.93	0.1864	0.1942
A	6.00	6.20	0.2364	0.2443
e	2.19	2.39	0.0861	0.0940
L	10.40	11.00	0.4098	0.4334
B	3.5	3.7	0.1379	0.1458
L2	1.5	1.7	0.0591	0.0670
θ	0	8	0	8
h	0	0.3	0	0.0118
V	5.25	5.45	0.2069	0.2147
E	0.6	0.8	0.0236	0.0315

**8 Attentions**

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- Product promotion is endless, our company will be dedicated to provide customers with better products.

**9 Appendix**

Revision history:

Date	REV.	Description	Page
2020.03.09	1.0	Original	
2022.8.09	1.1	Modify company name	all