

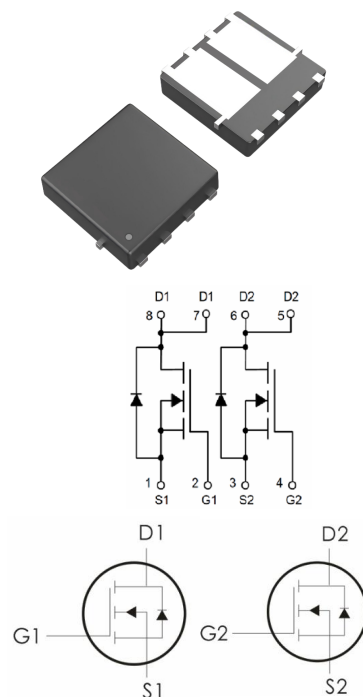
Description:

This Dual N-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=12V, I_D=40A, R_{DS(on)} < 5.5m\Omega @ V_{GS}=4.5V$ (Typ: $4.9m\Omega$)
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(on)}$.
- 5) Excellent package for good heat dissipation.
- 6) MSL3



Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
ZA5R5DNAG	A5R5DNA	DFN3*3-8D	5000 pcs/Reel

Absolute Maximum Ratings: ($T_c=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	12	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current ¹	40	A
	Continuous Drain Current- $T_A=100^\circ\text{C}$ ¹	28	
I_{DM}	Pulsed Drain Current ²	160	
P_D	Power Dissipation	18	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+150	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	7.5	$^\circ\text{C}/\text{W}$

Electrical Characteristics: ($T_c=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	12	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =12V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 12V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	Gate-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	0.4	0.7	1	V
R _{DS(on)}	Drain-Source On Resistance ⁴	V _{GS} =4.5V, I _D =4.5A	---	4.9	5.5	m Ω
		V _{GS} =2.5V, I _D =2.5A	---	6.6	8	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =6V, V _{GS} =0V, f=1MHz	---	1500	---	pF
C _{oss}	Output Capacitance		---	367.5	--	
C _{rss}	Reverse Transfer Capacitance		---	310.8	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =10V, I _D =3A, R _G =3 Ω ,V _{GS} =4.5V	---	0.52	---	ns
t _r	Rise Time		---	1.36	---	ns
t _{d(off)}	Turn-Off Delay Time		---	3.5	---	ns
t _f	Fall Time		---	3.4	---	ns
Q _g	Total Gate Charge	V _{GS} =4.5V, V _{DS} =10V, I _D =3A	---	25	---	nC
Q _{gs}	Gate-Source Charge		---	9.5	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	12.6	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =5A	---	---	1.2	V
I _S	Continuous Drain Current	V _D =V _G =0V	---	---	33.3	A
I _{SM}	Pulsed Drain Current		---	---	133.3	A
T _{rr}	Reverse Recovery Time	I _F =2A, T _J =25 °C	---	25	---	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/us	---	10	---	nC

Notes:

1. Computed continuous current assumes the condition of $T_{j,Max}$ while the actual continuous current depends on the thermal & electro-mechanical application board design
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

Test Circuit

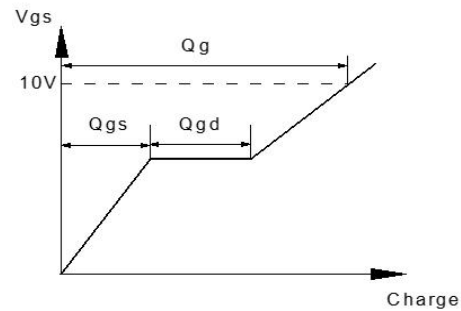
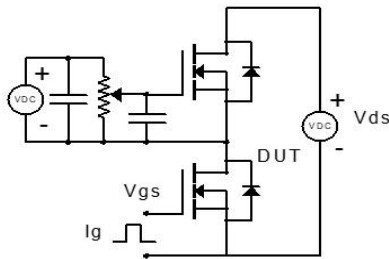


Figure 1: Gate Charge Test Circuit & Waveform

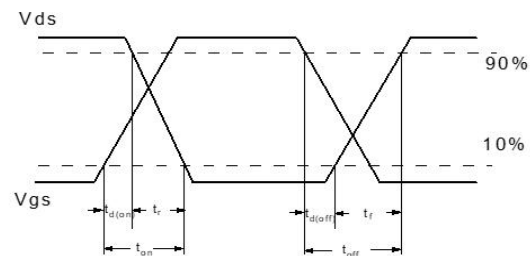
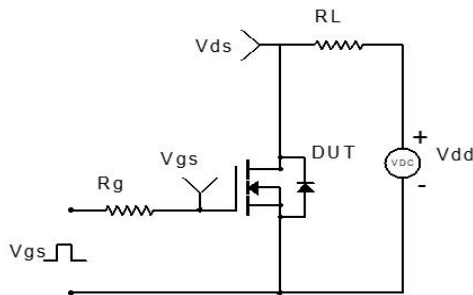


Figure 2: Resistive Switching Test Circuit & Waveform

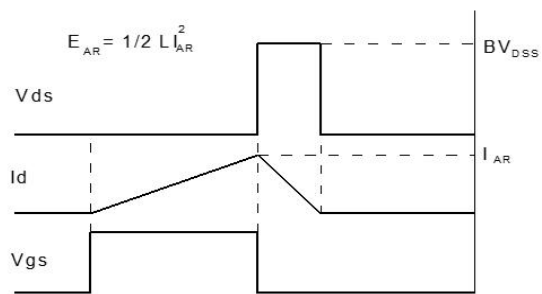
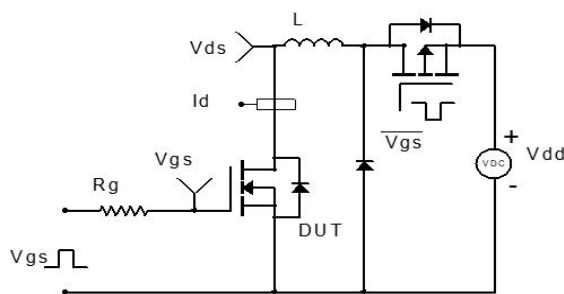


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

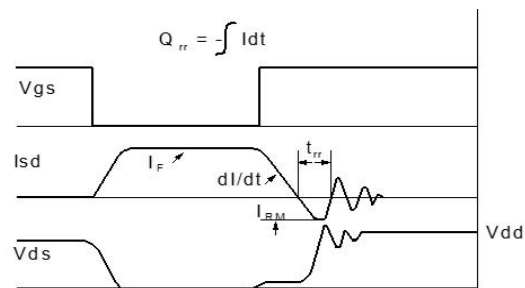
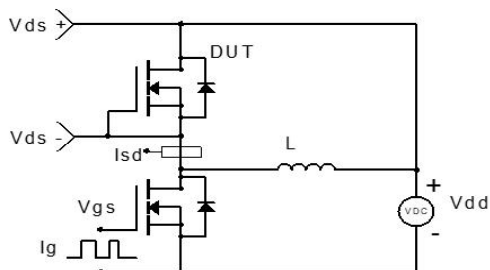
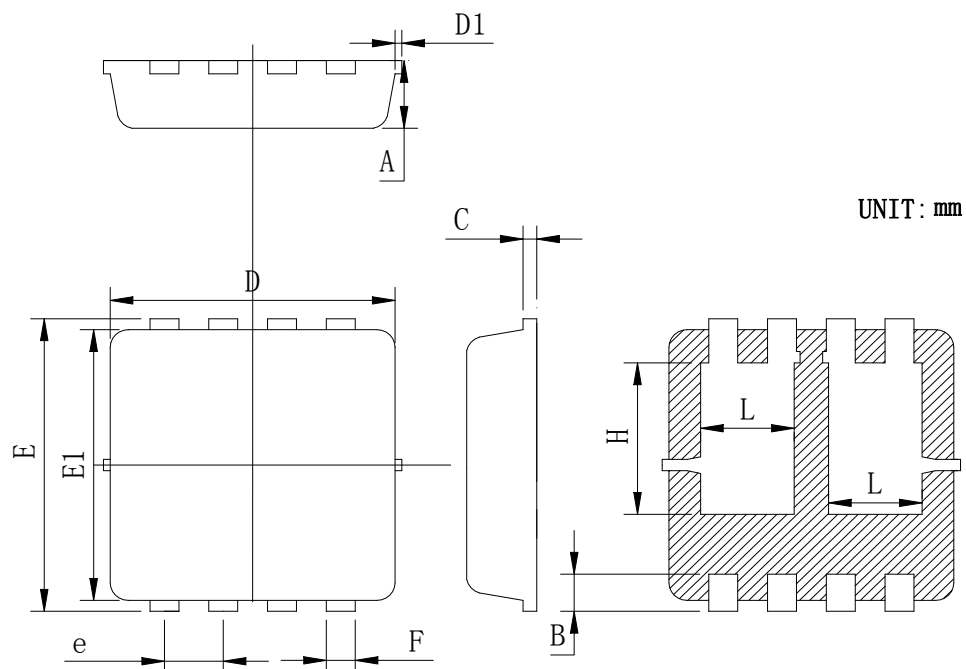


Figure 4: Diode Recovery Test Circuit & Waveform

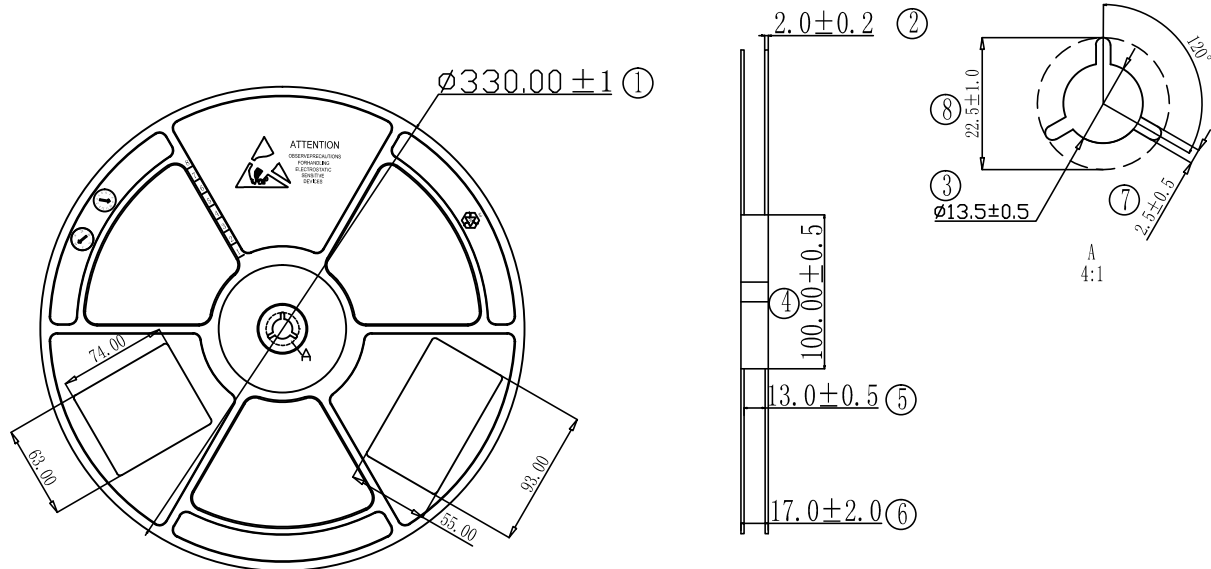
DFN3X3-8D Package Outline Data



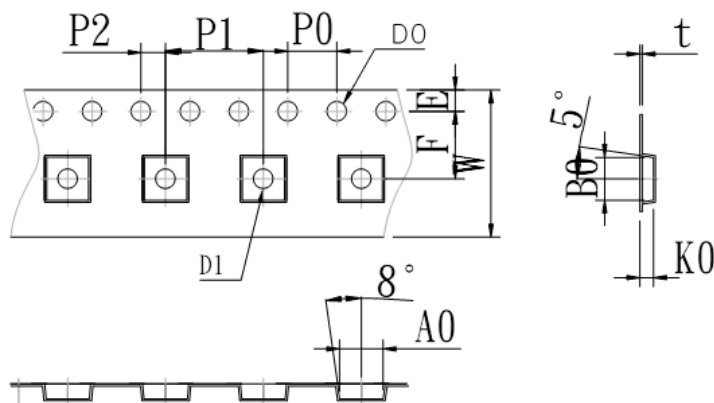
Symbol	Min	Typ	Max
A	0.725	0.775	0.825
B	0.28	0.38	0.48
C	0.13	0.15	0.20
D	3.05	3.15	3.25
D1			0.10
E	3.25	3.35	3.45
E1	3.0	3.1	3.2
e	0.60	0.65	0.70
F	0.27	0.32	0.37
H	1.63	1.73	1.83
L	0.93	1.03	1.13

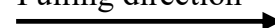
Tape & Reel Information

Dimensions in mm



Symbol	A0	B0	K0	D0	D1	P0	P1	10*P0
Spec	3.55 $\pm$ 0.10	3.45 $\pm$ 0.10	1.13 $\pm$ 0.10	1.55 $\pm$ 0.10	1.55 $\pm$ 0.10	4.00 $\pm$ 0.10	8.00 $\pm$ 0.10	40.0 $\pm$ 0.10
Symbol	W	E	F	P2	t			
Spec	12.00 $\pm$ 0.10	1.75 $\pm$ 0.10	5.50 $\pm$ 0.10	2.00 $\pm$ 0.10	0.20 $\pm$ 0.05			



Pulling direction 

Marking Information:

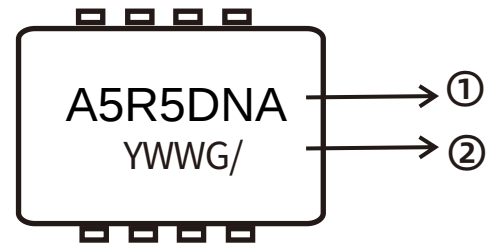
① . Part NO.

② . Date Code(YWWG / R)

Y : Year Code , last digit of the year

WW : Week Code(01-53)

G/R : G(Green) /R(Lead Free)



Previous Version

Version	Date	Subjects (major changes since last revision)
1.0	2026-05-02	Release of final version

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