

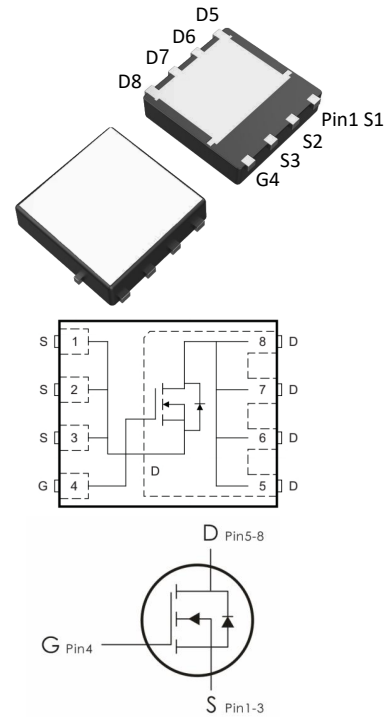
Description:

This N-Channel MOSFET uses advanced SGT 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) $V_{DS}=40V, I_D=250A, R_{DS(ON)} < 2.2m\Omega @ V_{GS}=10V$ (Typ: $1.7m\Omega$)
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density SGT technology for ultra low $R_{DS(ON)}$.
- 5) Excellent package for good heat dissipation.
- 6) Superior thermal resistance
- 7) Optimized design for double side cooling with top side insulation.
- 8) MSL3



Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
YD2R2TG-DSC	D2R2T-DSC	TDFN3333-8DSC	5000 pcs/Reel

Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current ¹	250	A
	Continuous Drain Current- $T_C=100^\circ C$ ¹	175	
	Pulsed Drain Current ²	750	
P_D	Power Dissipation	192	W
E_{AS}	Single pulse avalanche energy ³	91	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55--+150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.65	$^{\circ}\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	50	$^{\circ}\text{C}/\text{W}$

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	40	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =40V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	Gate-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1.0	1.3	2.0	V
R _{DS(ON)}	Drain-Source On Resistance ⁴	V _{GS} =10V, I _D =20A	---	1.7	2.2	m Ω
		V _{GS} =4.5V, I _D =10A	---	2.1	2.7	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =20V, V _{GS} =0V, f=1MHz	---	3200	---	pF
C _{oss}	Output Capacitance		---	1800	---	
C _{rss}	Reverse Transfer Capacitance		---	110	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =20V, I _D =30A, R _G =1.6 Ω ,V _{GS} =10V	---	17.4	---	ns
t _r	Rise Time		---	4.1	---	ns
t _{d(off)}	Turn-Off Delay Tim		---	55.4	---	ns
t _f	Fall Time		---	11.1	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =20V, I _D =30A	---	66	---	nC
Q _{gs}	Gate-Source Charge		---	15	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	10	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =30A	---	---	1.2	V
I _S	Continuous Drain Curren	V _D =V _G =0V	---	---	250	A
I _{SM}	Pulsed Drain Current		---	---	750	A

Trr	Reverse Recovery Time	$I_F=30A, T_J=25^{\circ}C$	---	85	---	ns
Qrr	Reverse Recovery Charge		---	34	---	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. EAS condition : $T_J=25^{\circ}C, V_{DD}=20V, V_G=10V, L=0.1mH$
4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

Test Circuit

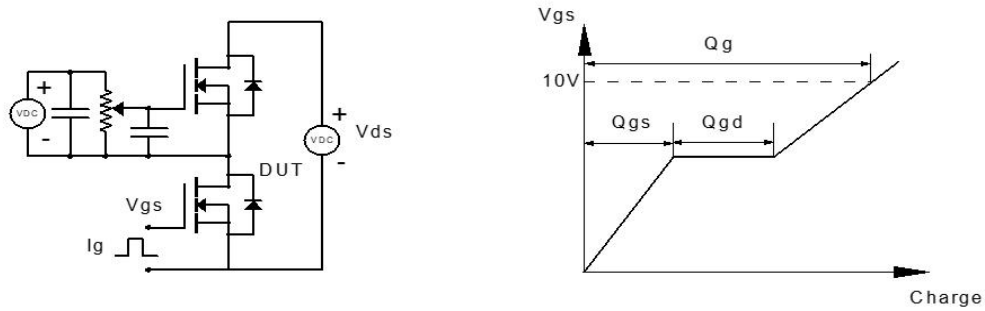


Figure 1: Gate Charge Test Circuit & Waveform

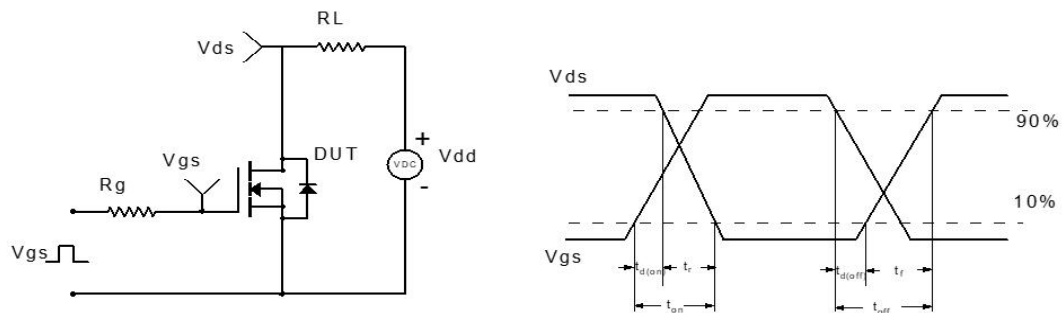


Figure 2: Resistive Switching Test Circuit & Waveform

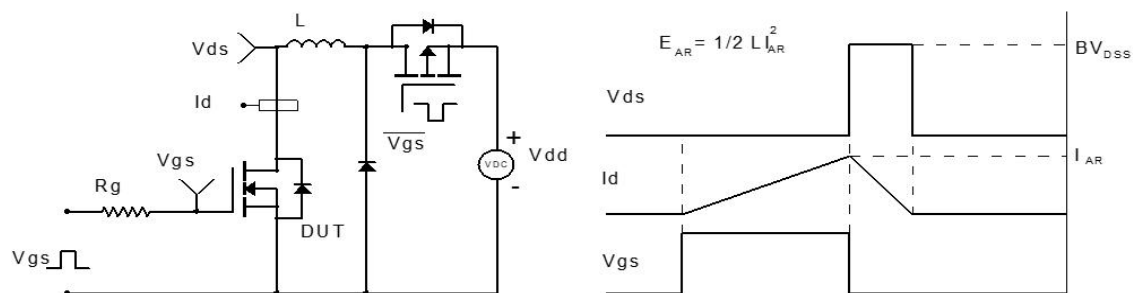


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

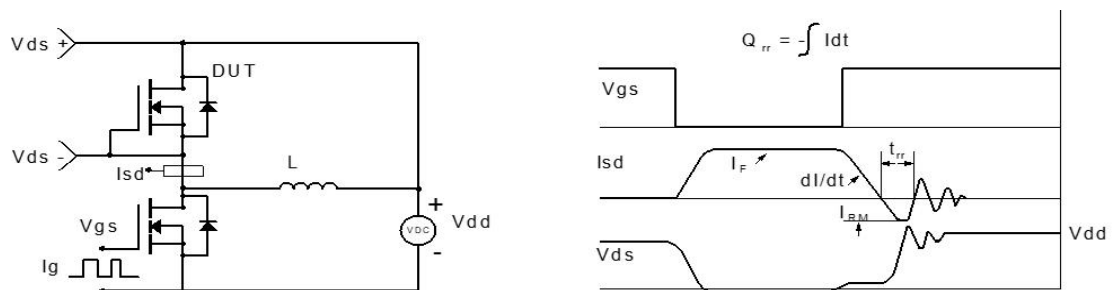
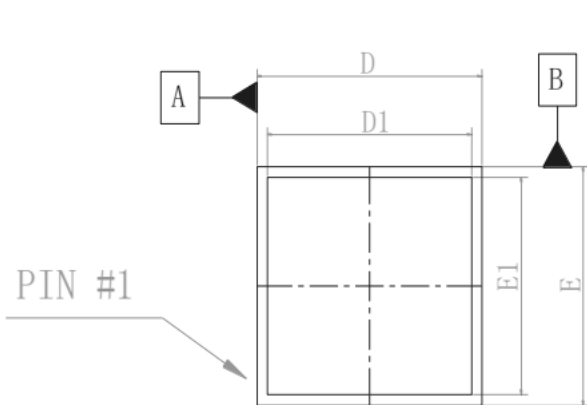
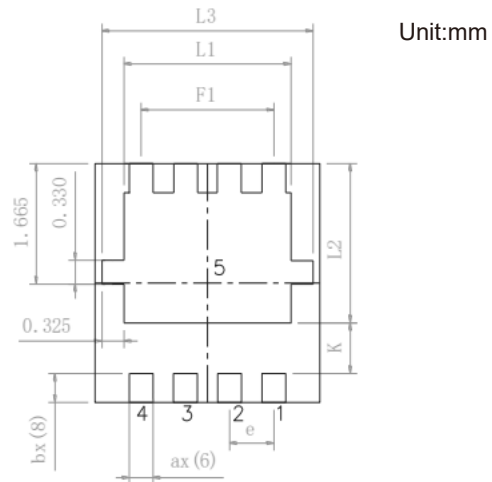


Figure 4: Diode Recovery Test Circuit & Waveform

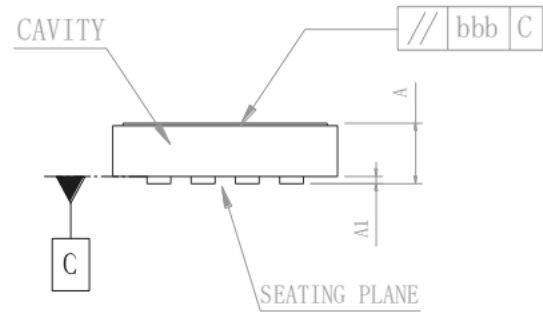
TDFN3333-8DSC Package Information:



Top View



Bottom View



Side View

symbol	Dimension in mm		
	MIN	NOM	MAX
A	0.600	0.650	0.700
A1	0.250	0.050	0.750
D	3.200	3.300	3.400
E	3.200	3.300	3.400
D1	2.900	3.000	3.100
E1	2.900	3.000	3.100
F1	--	1.950	--
e	--	0.650	--
ax(6)	0.300	0.350	0.400
bx(8)	0.350	0.400	0.450
L1	2.400	2.450	2.500
L2	2.150	2.200	2.250
L3	3.050	3.100	3.150
K	0.600	0.700	0.800
bbb	0.100		
N	5		
MD/ME	4/2		

Marking Information:

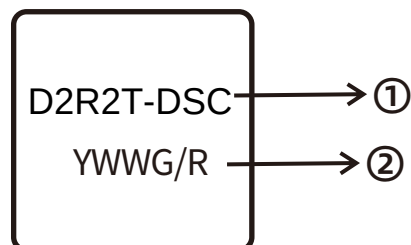
①. Part NO.

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	2025-06-05	Release of final version

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