

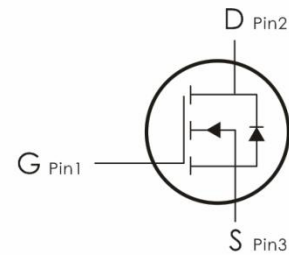
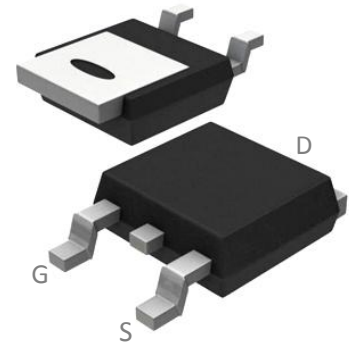
## Description:

This N-Channel MOSFET uses advanced Planar 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)  $V_{DS}=650V, I_D=5A, R_{DS(ON)} < 2800m\ \Omega @ V_{GS}=10V$  (Typ:  $2300m\ \Omega$ )
- 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
DO05NG-I	O05N-I	TO- 252	2500 pcs/Reel

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

Symbol	Parameter	Ratings	Units
$V_{DS}$	Drain-Source Voltage	650	V
$V_{GS}$	Gate-Source Voltage	$\pm 30$	V
$I_D$	Continuous Drain Current <sup>1</sup>	5	A
	Continuous Drain Current- $T_C=100^\circ C$ <sup>1</sup>	3.5	
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	20	
$P_D$	Power Dissipation	59.5	W
$E_{AS}$	Single pulse avalanche energy <sup>3</sup>	220	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	2.1	$^\circ C/W$

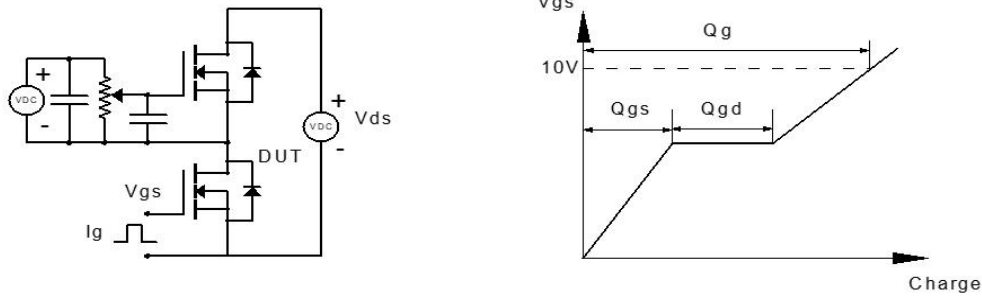
**Electrical Characteristics:** ( $T_C=25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	650	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=650V$	---	---	1	$\mu\text{A}$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0A$	---	---	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	2	3.5	4	V
$R_{DS(on)}$	Drain-Source On Resistance <sup>4</sup>	$V_{GS}=10V, I_D=2A$	---	2300	2800	m $\Omega$
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1\text{MHz}$	---	690	---	pF
$C_{oss}$	Output Capacitance		---	55	--	
$C_{rss}$	Reverse Transfer Capacitance		---	3.5	---	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=325V, I_D=4A,$ $R_{ENG}=10\ \Omega, V_{GS}=10V$	---	14	---	ns
$t_r$	Rise Time		---	16.8	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	33.6	---	ns
$t_f$	Fall Time		---	11.5	---	ns
$Q_g$	Total Gate Charge	$V_{GS}=10V, V_{DS}=520V,$ $I_D=4A$	---	17	---	nC
$Q_{gs}$	Gate-Source Charge		---	3	---	nC
$Q_{gd}$	Gate-Drain "Miller" Charge		---	6.5	---	nC
<b>Drain-Source Diode Characteristics</b>						
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_{SD}=4A$	---	---	1.5	V
$I_S$	Continuous Drain Current	$V_D=V_G=0V$	---	---	4.1	A
$I_{SM}$	Pulsed Drain Current		---	---	13.3	A
$T_{rr}$	Reverse Recovery Time	$I_F=4A, T_J=25^\circ\text{C}$	---	256	---	ns
$Q_{rr}$	Reverse Recovery Charge	$dI/dt=100A/\mu\text{s}$	---	1200	---	nC

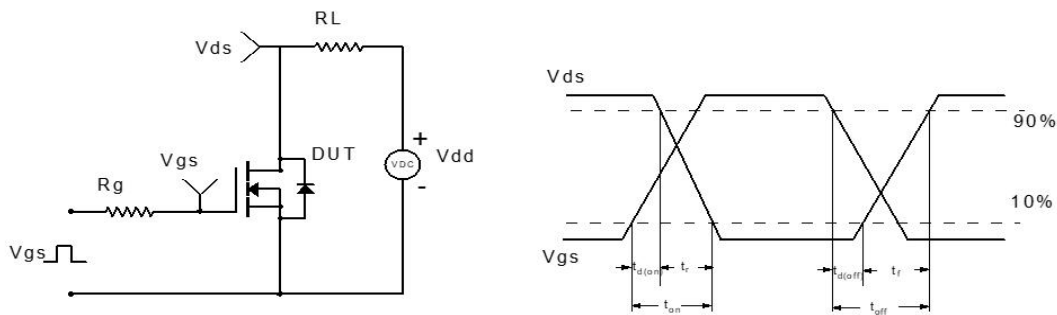
### Notes:

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 :  $T_J=25^{\circ}C, V_{DD}=325V, V_G=10V, L=0.5mH$
4. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 0.5\%$

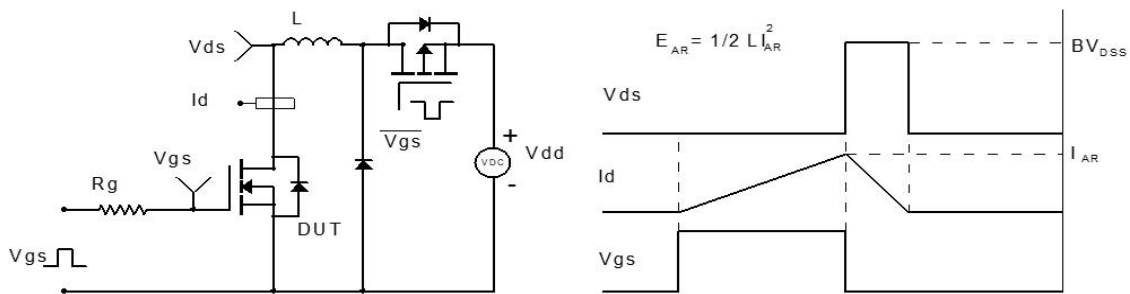
### Test Circuit



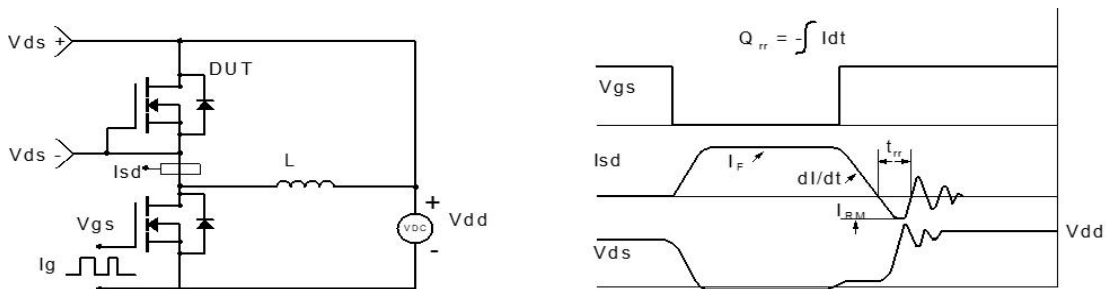
**Figure 1: Gate Charge Test Circuit & Waveform**



**Figure 2: Resistive Switching Test Circuit & Waveform**



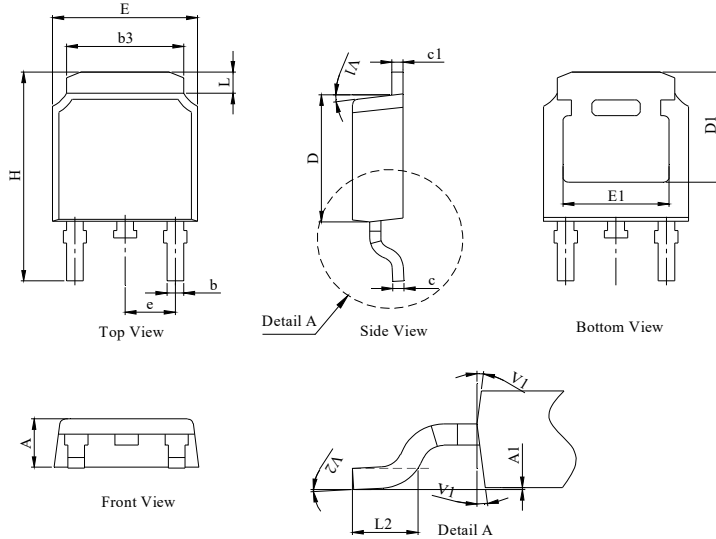
**Figure 3: Unclamped Inductive Switching Test Circuit & Waveform**



**Figure 4: Diode Recover Test Circuit & Waveform**

## TO-252 Package Information

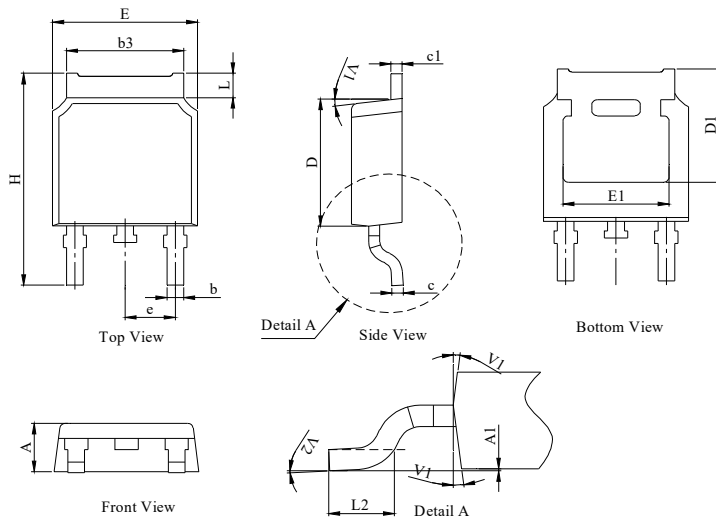
### Package Outline Type-A



UNIT: mm

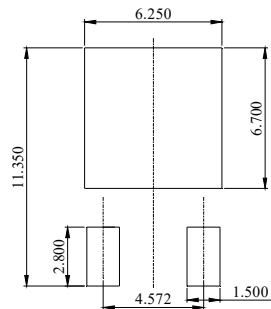
DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.18	2.30	2.39
A1	0	--	0.13
b	0.64	0.76	0.89
c	0.40	0.50	0.61
c1	0.46	0.50	0.58
D	5.97	6.10	6.23
D1	5.05	--	--
E	6.35	6.60	6.73
E1	4.32	--	--
b3	5.21	5.38	5.55
e	2.29 BSC		
H	9.40	10.00	10.40
L	0.89	--	1.27
L2	1.40	--	1.78
V1	7° REF		
V2	0°	--	6°

### Package Outline Type-B



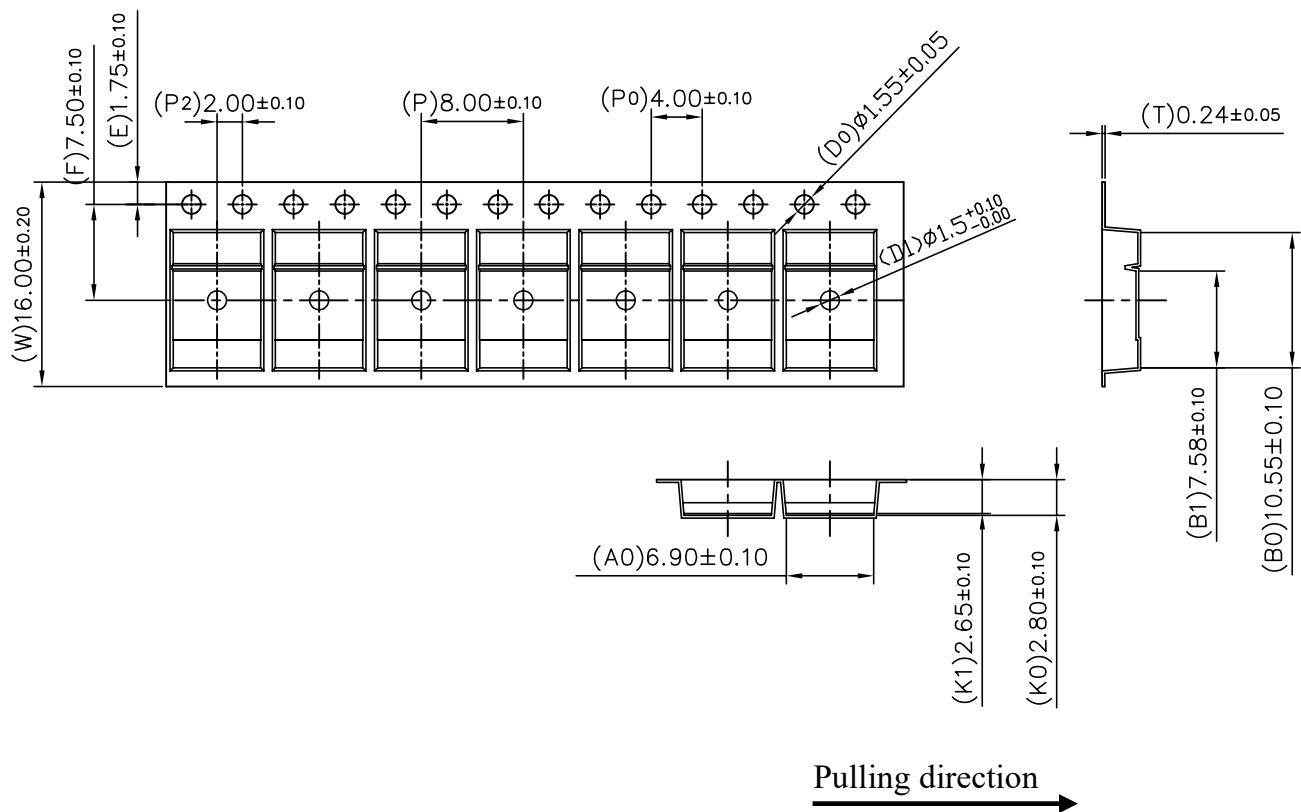
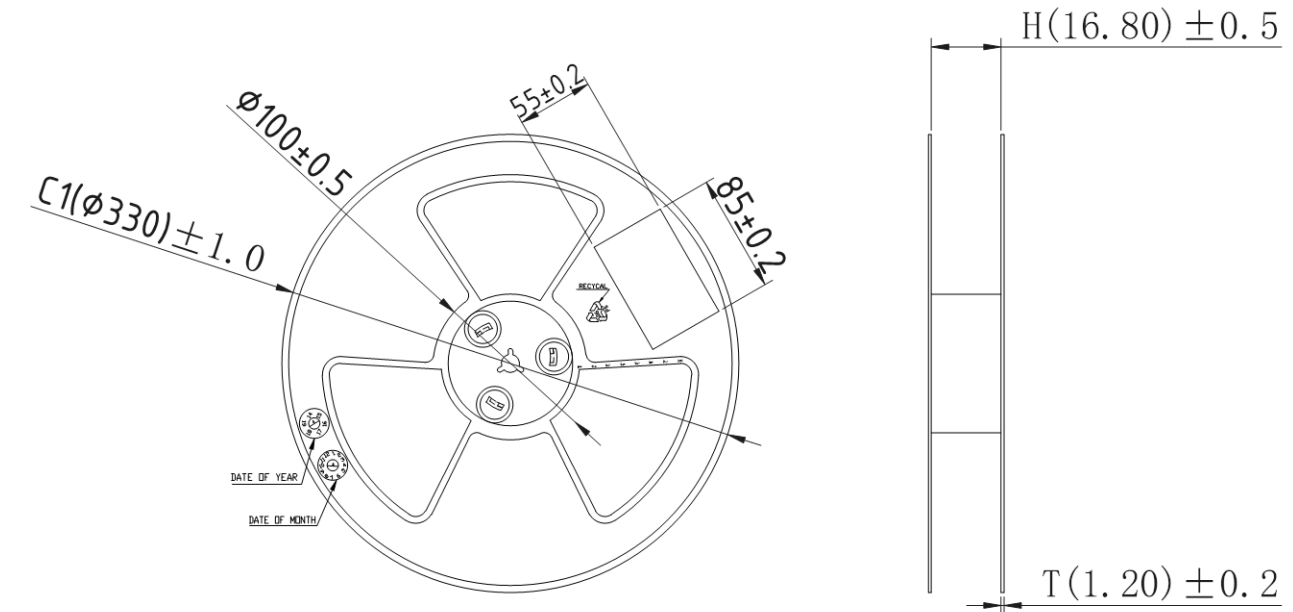
DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.10	2.30	2.40
A1	0	--	0.13
b	0.66	0.76	0.86
b3	5.21	5.38	5.55
c	0.40	0.50	0.60
c1	0.44	0.50	0.58
D	5.90	6.10	6.30
D1	5.30REF		
E	6.40	6.60	6.80
E1	4.63	-	-
e	2.29 BSC		
H	9.50	10.00	10.70
L	1.09	--	1.21
L2	1.35	--	1.65
V1	7° REF		
V2	0°	--	6°

### Recommended Soldering Footprint



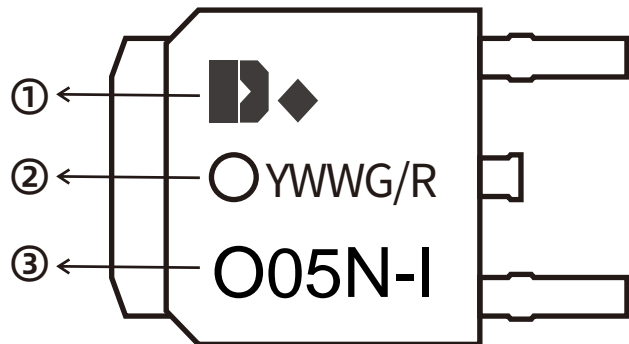
## Tape & Reel Information

Dimensions in mm



**Marking Information:**

- ①. Doingter LOGO
- 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)
- ③. Part NO.


**Previous Version**

Version	Date	Subjects (major changes since last revision)
1.1	2025-11-15	Release of final version

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