

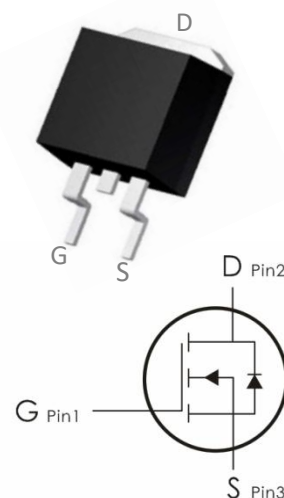
## Description:

This 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)  $V_{DS}=30V, I_D=120A, R_{DS(on)} < 3.5m\Omega @ V_{GS}=10V$  (Typ : 2.9m $\Omega$ )
- 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.



## Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
DOB120N03	120N03	TO- 263	800 pcs/Reel

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

Symbol	Parameter	Ratings	Units
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current- $T_C=25^\circ\text{C}$	120	A
	Continuous Drain Current- $T_C=100^\circ\text{C}$	89	
	Pulsed Drain Current <sup>1</sup>	560	
$E_{AS}$	Single Pulse Avalanche Energy <sup>2</sup>	125	mJ
$P_D$	Power Dissipation ( $T_C=25^\circ\text{C}$ )	125	W
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

## Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62	

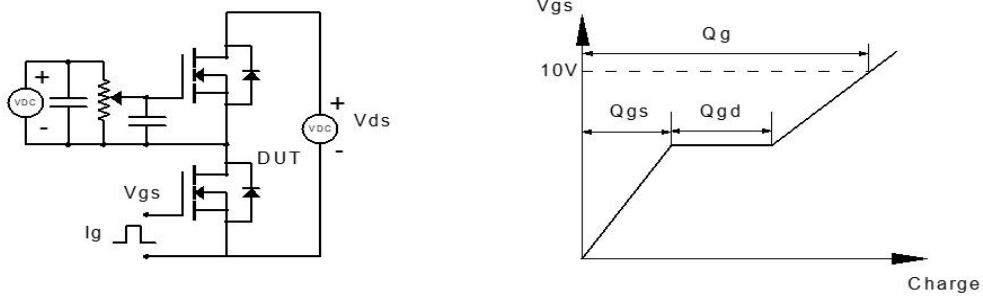
## Electrical Characteristics: ( $T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV <sub>DSS</sub>	Drain-Sourtce Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250 μ A	30	---	---	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>GS</sub> =0V, V <sub>DS</sub> =30V	---	---	1	μ A
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =± 20V, V <sub>DS</sub> =0A	---	---	± 100	nA
On Characteristics						
V <sub>GS(th)</sub>	Gate-Source Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250 μ A	1	1.6	2.2	V
R <sub>DS(ON)</sub>	Drain-Source On Resistance <sup>3</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =30A	---	2.9	3.5	m Ω
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A	---	4.6	6	m Ω
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz	---	2756	---	pF
C <sub>oss</sub>	Output Capacitance		---	353	--	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	327	---	
Switching Characteristics						
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =15V, I <sub>D</sub> =30A, R <sub>ENG</sub> =3 Ω ,V <sub>GS</sub> =10V	---	11.5	---	ns
t <sub>r</sub>	Rise Time		---	30.4	---	ns
t <sub>d(off)</sub>	Turn-Off Delay Time		---	49	---	ns
t <sub>f</sub>	Fall Time		---	19	---	ns
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, I <sub>D</sub> =30A	---	60.9	---	nc
Q <sub>gs</sub>	Gate-Source Charge		---	12.6	---	nc
Q <sub>gd</sub>	Gate-Drain “Miller” Charge		---	13.6	---	nc
Drain-Source Diode Characteristics						
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>SD</sub> =30A	---	---	1.2	V
I <sub>S</sub>	Continuous Drain Curren	V <sub>D</sub> =V <sub>G</sub> =0V	---	---	120	A
I <sub>SM</sub>	Pulsed Drain Current		---	---	560	A
T <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> =30A,	---	16	---	ns
Q <sub>rr</sub>	Reverse Recovery Charge	dI/dt=100A/us	---	7	---	nc

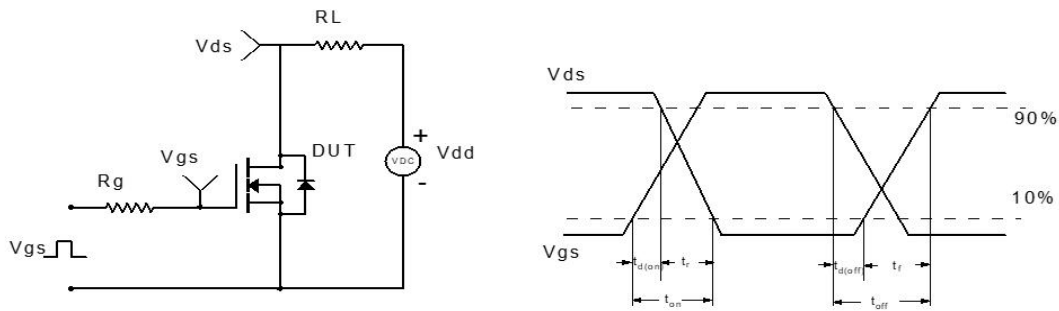
## Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2.  $E_{AS}$  condition: Starting  $T_J=25^{\circ}\text{C}$ ,  $V_{DD}=30\text{V}$ ,  $V_G=10\text{V}$ ,  $R_G=25\Omega$ ,  $L=0.5\text{mH}$ ,  $I_{AS}=28\text{A}$
3. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 0.5\%$ .

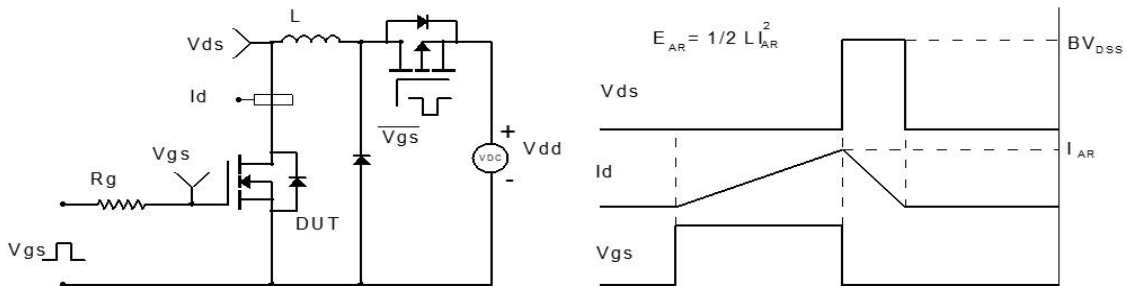
## Test Circuit



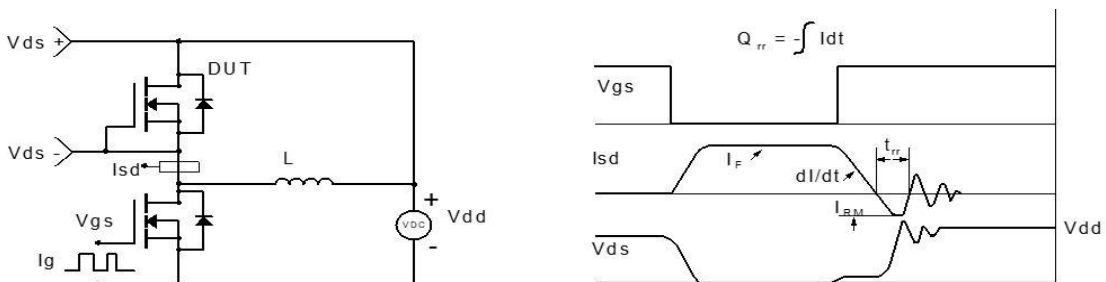
**Figure 1: Gate Charge Test Circuit & Waveform**



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



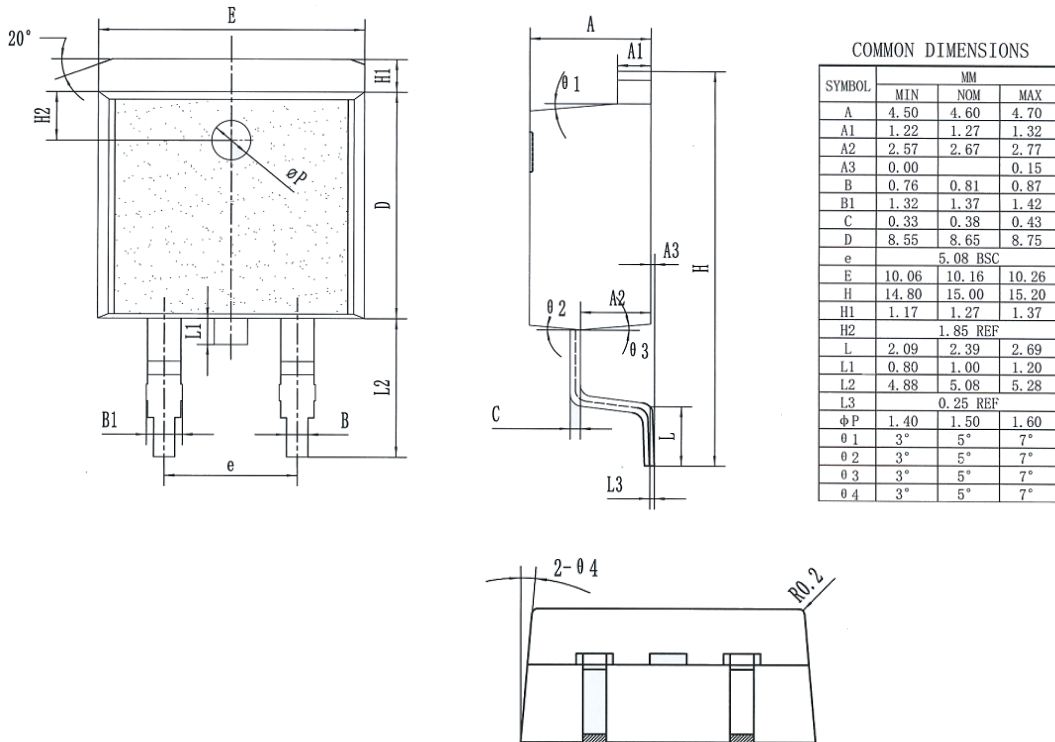
**Figure 3: Unclamped Inductive Switching Test Circuit & Waveform**



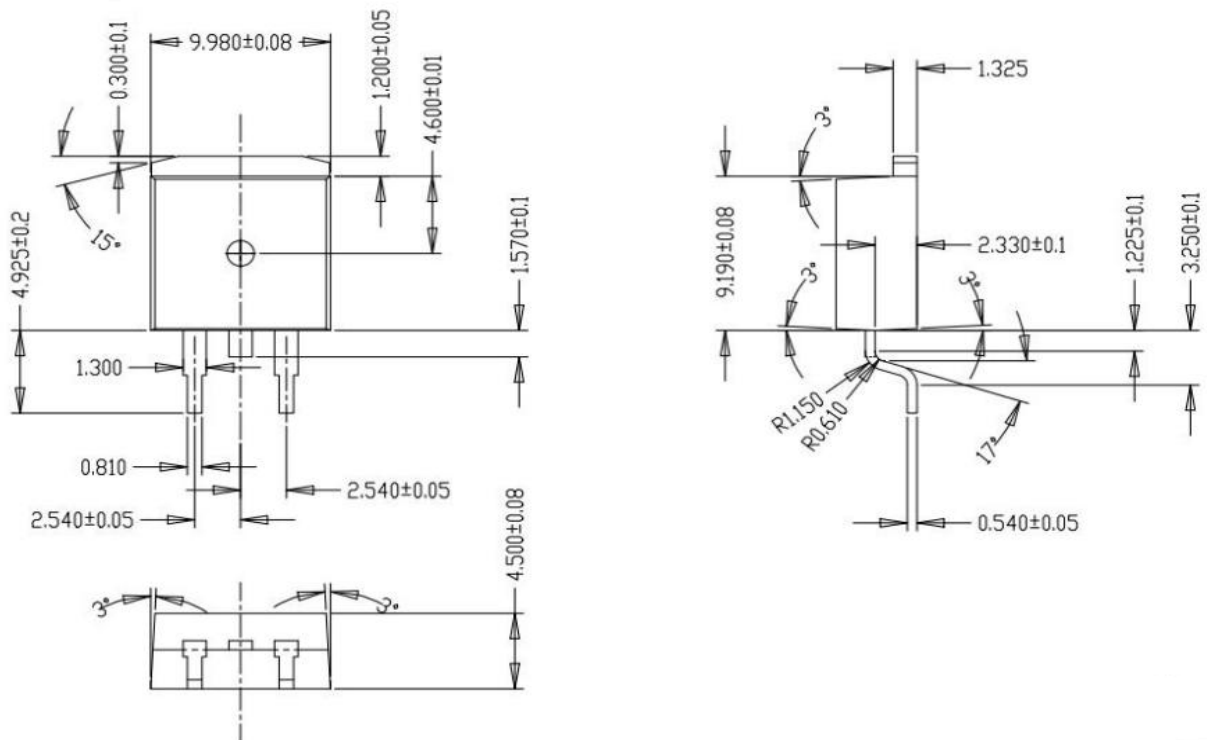
**Figure 4: Diode Recovery Test Circuit & Waveform**

## TO-263 Package Information: Unit:mm

Package Outline Type-A



Package Outline Type-B



### Marking Information:

①. Doingter LOGO

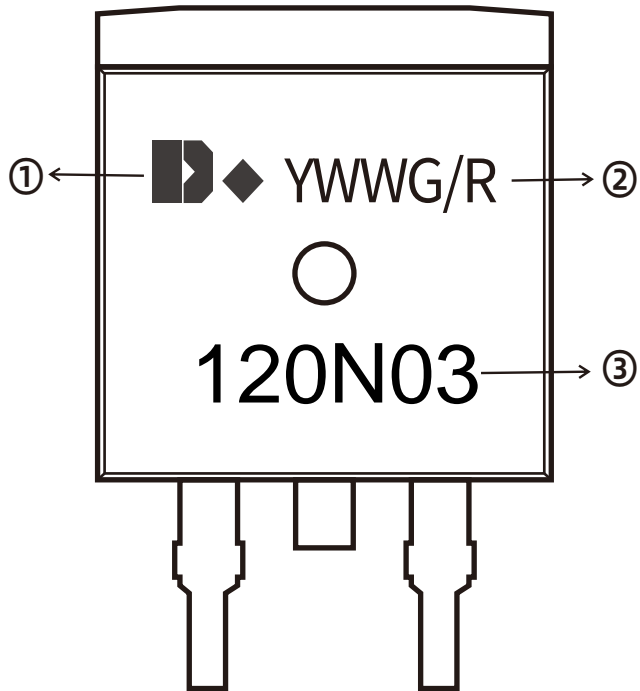
②. Date Code(YWWG / R)

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)
2.0	2024-07-27	Release of final version

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