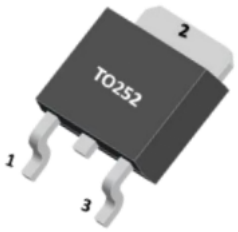
20N03

N-CHANNEL POWER MOSFET

20A, 30V N-CHANNEL ENHANCEMENT MODE POWER MOSFET

■ DESCRIPTION

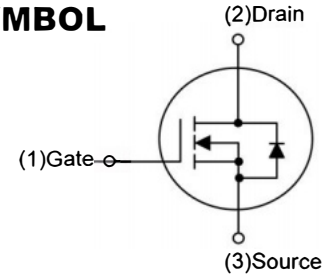
The 20N03 meet the ROHS and Green Product requirement with full function reliabilit y approved.



■ FEATURE

* Ambient operating temperature: 175° C
* Low drain-source and low on-resistance
* Logic level
* Perfect gate charge × RDS(ON) product
* Superior thermal resistance
* Avalanche rated
* Specified dv/dt
* For fast switching buck converters

SYMBOL



ABSOLUTE MAXIMUM RATINGS(TA=25°C, unless otherwise specified.)

SYMBOL	PARAMETER		VALUE	UNIT
VDSS	Drain-Source Voltage		30	V
VGSS	Gate Source Voltage		±20	V
ID	Continuous Drain Current (TC=25°C)		20	A
IDM	Pulsed Drain Current (TC=25°C)		120	A
EAS	Avalanche Energy	Single Pulsed (Note 3)	15	mJ
EAR		Repetitive (Note 2)	6	mJ
PD	Maximum Power Dissipation (Note 1)	TO-252	60	W
TJ	Storage Temperature		150	C
TSTG	Thermal Resistance Fr .0om Junction To Ambient		-55~150	C
RθJA	Thermal Resistance fromJunction to Ambien	TO-252	100	C/W
RθJC	Thermal Resistance From Junction To Case	TO-252	2.5	C/W

Notes: 1.Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2.Repetitive Rating: Pulse width limited by maximum junction temperature.
3.ID =15 A, VDD =25 V, RG = 25 Ω, Starting TJ = 25°C.
4.IS = 20 A, VDS =24 V, di/dt =100A/μs, TJ(MAX) = 175 °C

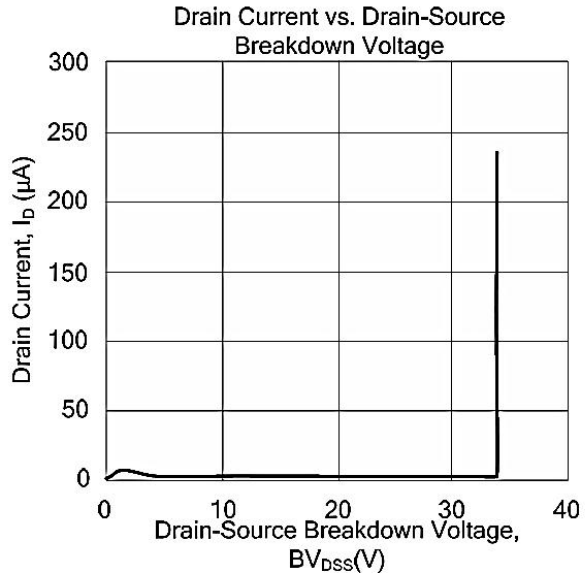
■ ELECTRICAL CHARACTERISTICS (TA=25°C, unless otherwise specified)

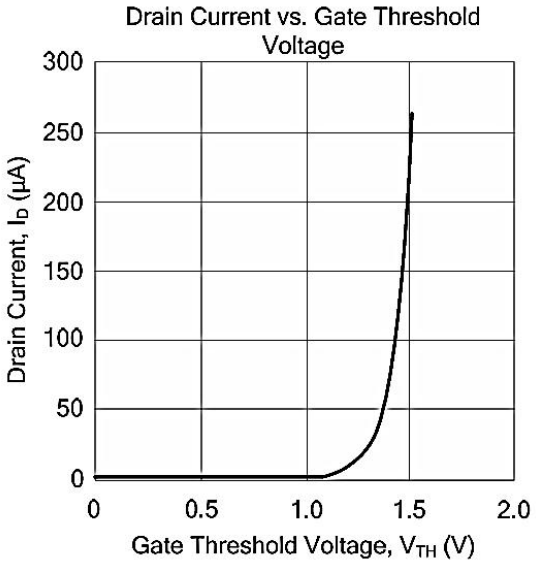
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	30			V
Zero gate voltage drain current	I_{DSS}	V_{DS}=30V,V_{GS}=0V		0.01	1	μA
Gate-body leakage current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
ON CHARACTERISTICS						
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=15A		15.5	20	mΩ
		V_{GS}=4.5V, I_D=15A		22.9	31	
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS}=V_{DS},I_D=250μA	1.2	1.6	2	V
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{GS}=0V, V_{DS}=25V f=1.0MHz		530	700	pF
Output Capacitance	C_{OSS}			200	275	
Reverse Transfer Capacitance	C_{RSS}			60	90	
Gate Resistance	R_G			1.3		Ω
SWITCHING PARAMETERS						
Total gate charge	Qg	V_{DS}=15V,V_{GS}=10V I_D=10A,I_G=1mA (Note 1,2)		8.4	11	nC
Gate-source charge	Qgs			2.5	3.1	
Gate-drain charge	Qgd			6.4	9.6	
Turn-On Delay Time	td(on)	V_{DD}=15V, I_D=15A V_{GS}=10V, R_G=12.7Ω		6.2	9.3	nS
Turn-On Rise time	tr			11	17	
Turn-Off Delay Time	td(off)			23	34	
Turn-Off Fall time	tf			18	27	
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Continuous drain-source diode forward current(Note1)	I_S				20	A
Pulsed drain-source diode forward current(Note 2)	I_{SM}				120	A
Drain-source diode forward voltage(Note 4)	V_{SD}	I_S=20A,V_{GS}=0V		1.1	1.4	V
Reverse Recovery Time	trr	V_R=15V,I_F = I_S dI/dt =100A/μs		15	18	ns
Reverse Recovery Charge	Qrr			2	3	nC

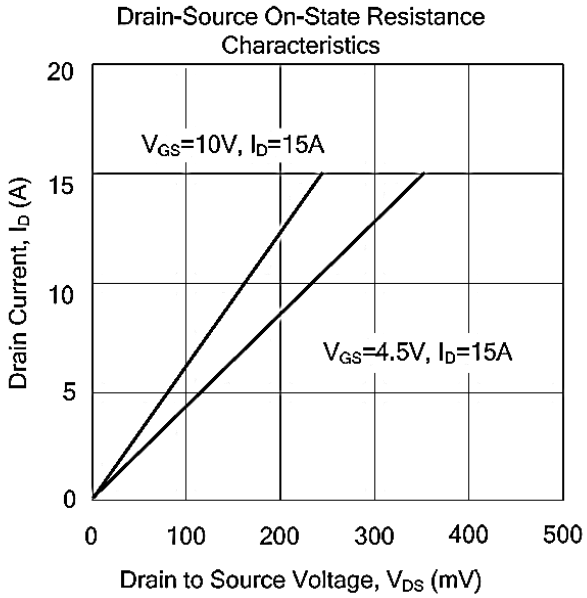
Notes:

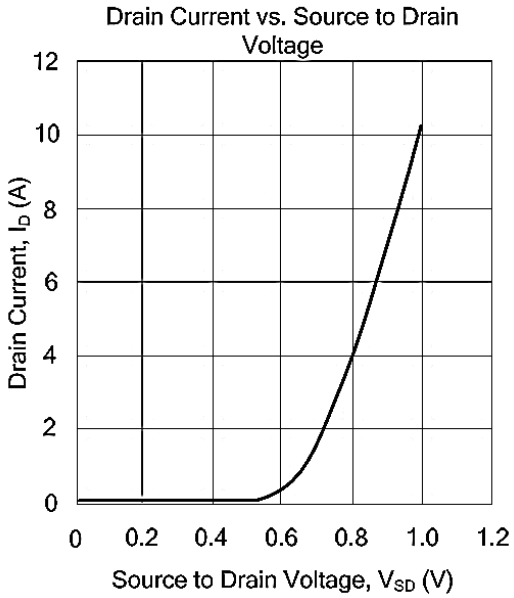
1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

■ TYPICAL CHARACTERISTICS

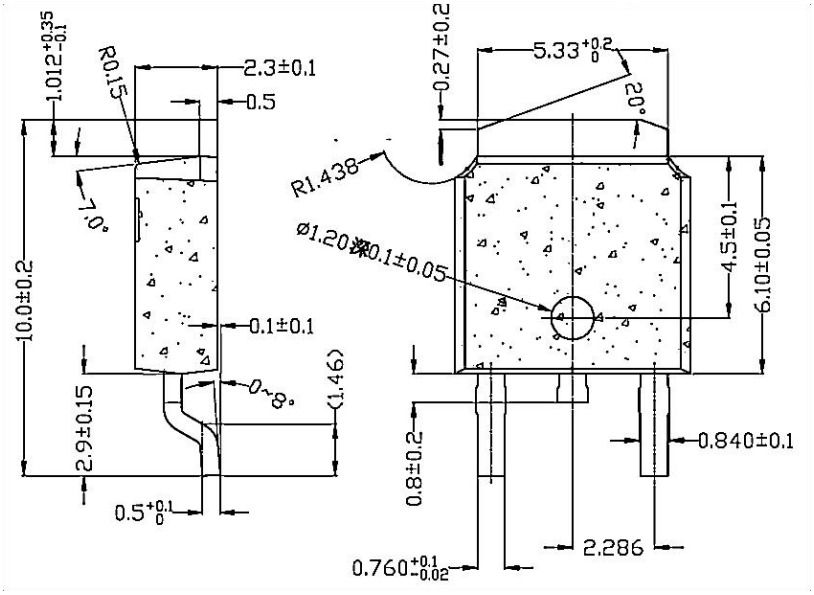


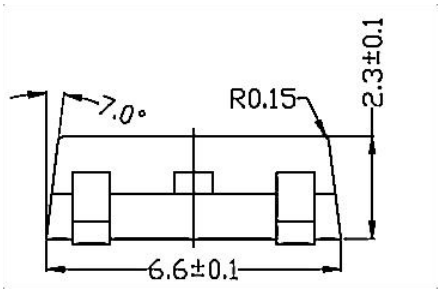






■ TO - 252 PACKAGE OUTLINE DIMENSIONS





■ TO - 252 PACKING INFORMATION

Package version	Reel dimensions Φ×H (mm)	Per Reel (pcs)	Reels per box	Inner box dimensions L×W×H(mm)	Outer box (pcs)	Outer box dimensions L×W×H (mm)
TO-252	Φ330*20	2500	2	360*340*50	25000	375*375*280