

TO-252-2L Plastic-Encapsulate MOSFETS

RC20N03

N-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	17mΩ@10V	20A
	22mΩ@4.5V	

DESCRIPTION

The RC20N03 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.

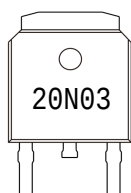
FEATURES

- High density cell design for ultra low $R_{DS(on)}$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}

APPLICATIONS

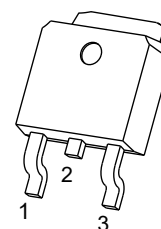
- Hard switched and high frequency circuits
- Uninterruptible power supply
- Special process technology for high ESD capability
- Excellent package for good heat dissipation
- Power switching application

MARKING



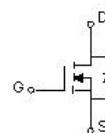
20N03= Device code

TO-252-2L



1. GATE
2. DRAIN
3. SOURCE

EQUIVALENT CIRCUIT



MAXIMUM RATINGS ($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	20	A
Pulsed Drain Current	I_{DM}	60	A
Single Pulsed Avalanche Energy	$E_{AS}^{(1)}$	22.1	mJ
Power Dissipation	P_D	2	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	62	$^{\circ}\text{C/W}$
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature Range	T_{stg}	-55 ~+150	$^{\circ}\text{C}$
Lead Temperature for Soldering Purposes(1/8" from case for 10s)	T_L	260	$^{\circ}\text{C}$

(1). E_{AS} condition: $V_{DD}=50\text{V}$, $L=0.5\text{mH}$, $R_G=25\Omega$, Starting $T_J = 25^{\circ}\text{C}$

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Electrical characteristics ($T_a=25^{\circ}\text{C}$ unless otherwise noted)

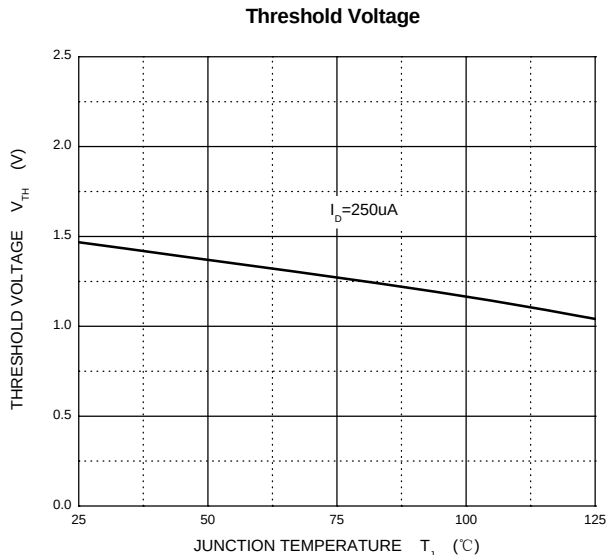
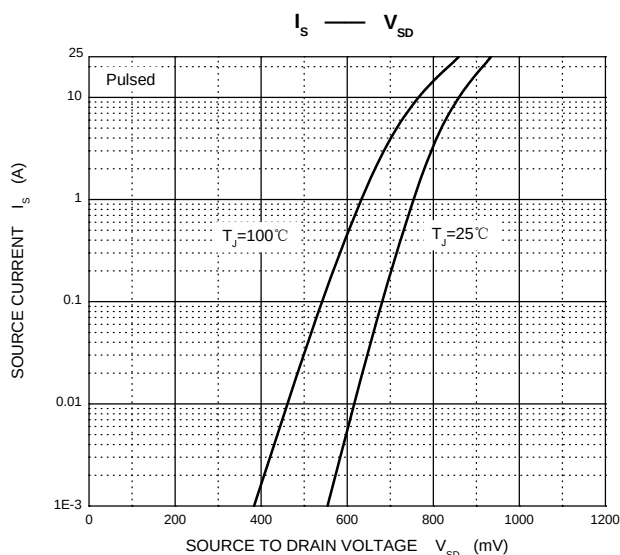
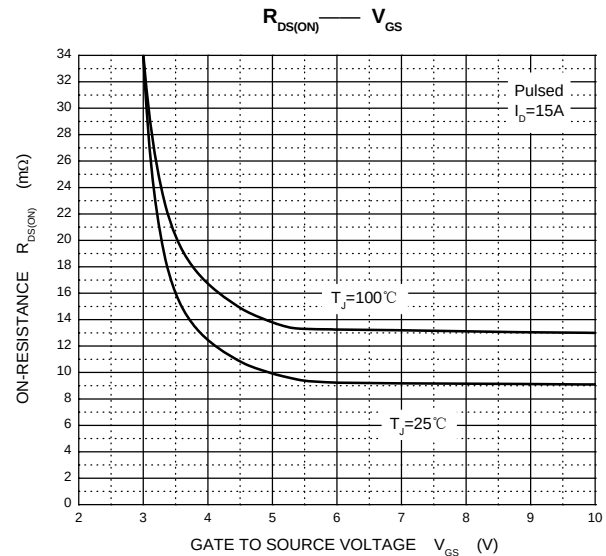
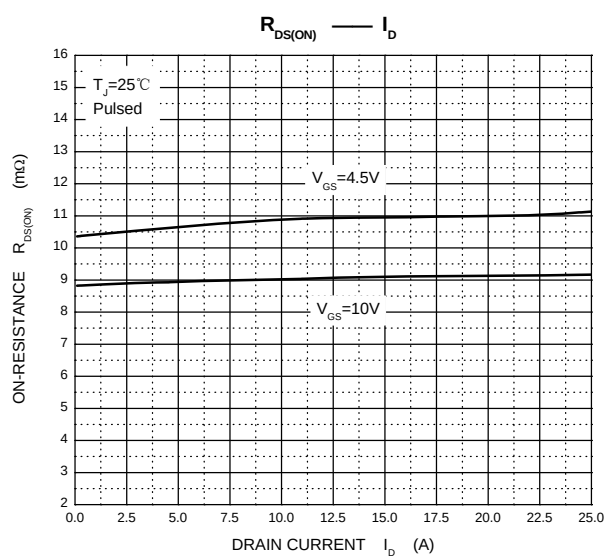
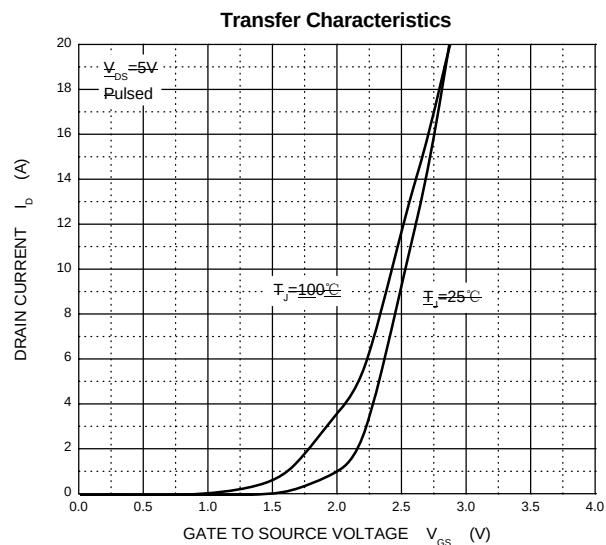
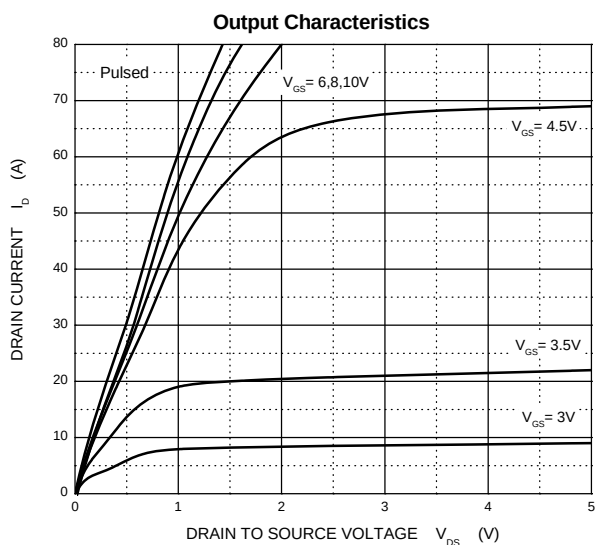
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	V _{(BR) DSS}	V _{GS} = 0V, I _D =250μA	30			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =30V, V _{GS} =0V			1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
On characteristics (note1)						
Gate-threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.5	2.2	V
Static drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =15A		17	20	mΩ
Static drain-source on-resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =10A		22	30	mΩ
Dynamic characteristics (note 2)						
Input capacitance	C _{iss}	V _{DS} =15V,V _{GS} =0V, f =1MHz		572		pF
Output capacitance	C _{oss}			81		
Reverse transfer capacitance	C _{rss}			65		
Switching characteristics (note 2)						
Total gate charge	Q _g	V _{DS} =15V, V _{GS} =10V, I _D =20A		6.2		nC
Gate-source charge	Q _{gs}			2.4		
Gate-drain charge	Q _{gd}			2.5		
Turn-on delay time	t _{d(on)}	V _{DD} =15V,I _D =2A, V _{GS} =10V,R _G =3Ω, R _L =0.75Ω		5		ns
Turn-on rise time	t _r			12		
Turn-off delay time	t _{d(off)}			19		
Turn-off fall time	t _f			6		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage(note1)	V _{SD}	V _{GS} =0V, I _S =10A			1.2	V
Continuous drain-source diode forward current	I _S				20	A
Pulsed drain-source diode forward current	I _{SM}				60	A

Notes:

1. Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
2. Guaranteed by design, not subject to production.

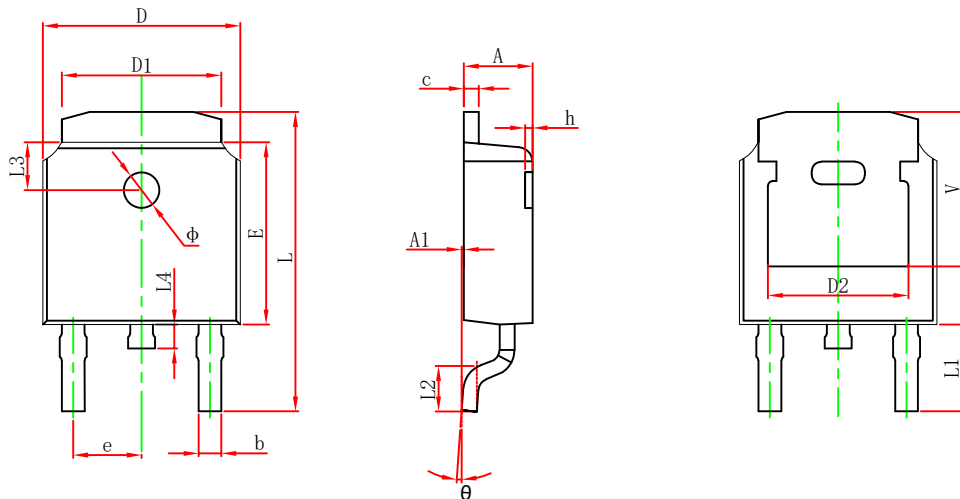
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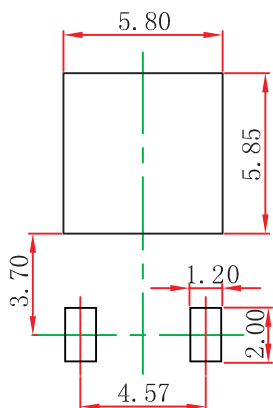
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TO-252-2L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	

TO-252-2L Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.