

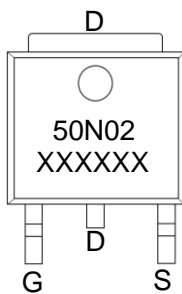
## 20V/50A N-Channel MOSFET

### Features

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

### Application

- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

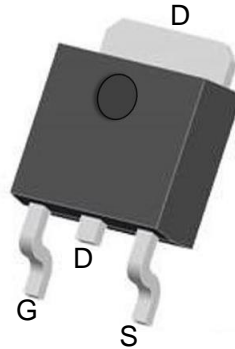


50N02 : Device code  
XXXXXX : Code

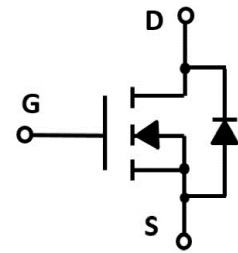
Marking and pin assignment

### Product Summary

$V_{DS}$	$R_{DS(ON)}$ MAX	$I_D$ MAX
20V	10m $\Omega$ @4.5V	50A
	13m $\Omega$ @2.5V	



TO-252 top view



Schematic diagram

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

Symbol	Parameter	Rating	Unit
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### Common Ratings ( $T_C=25^\circ\text{C}$ Unless Otherwise Noted)

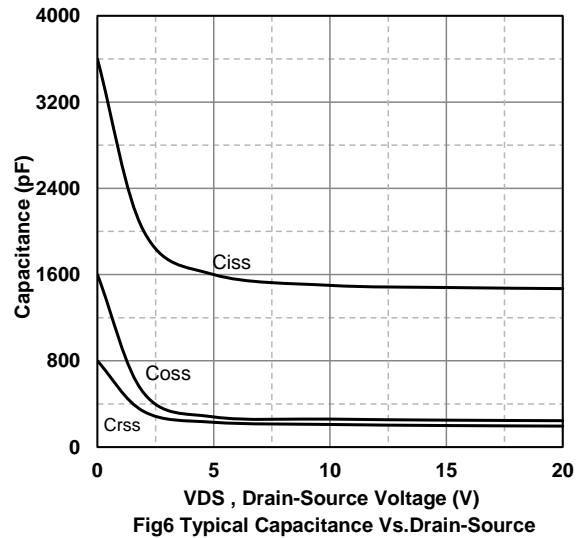
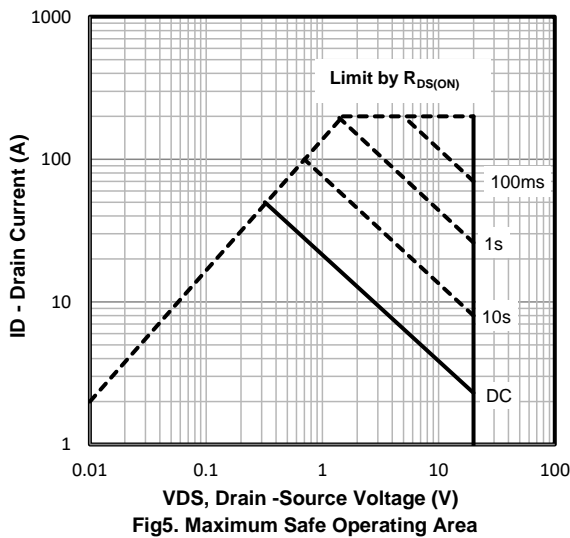
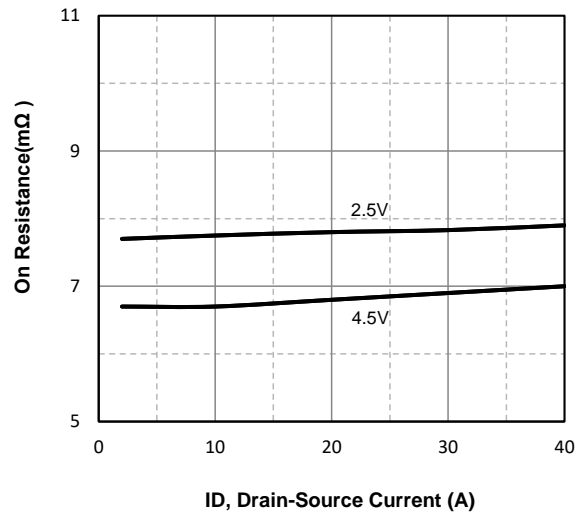
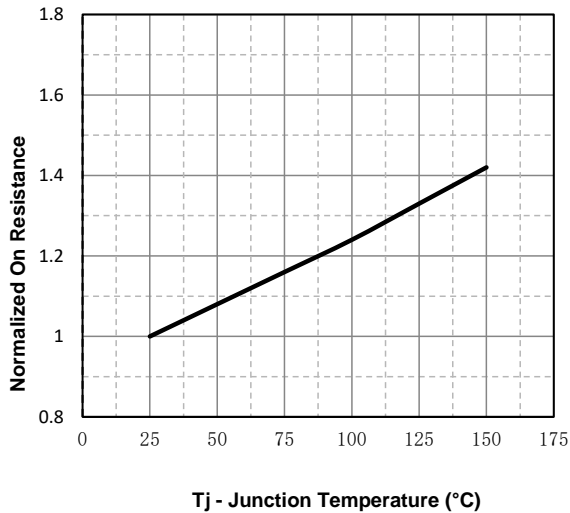
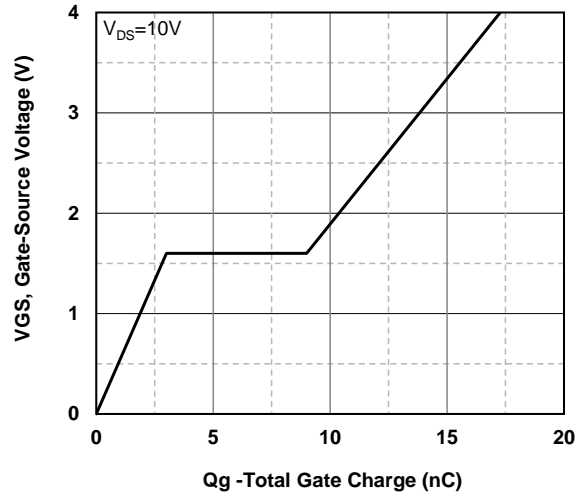
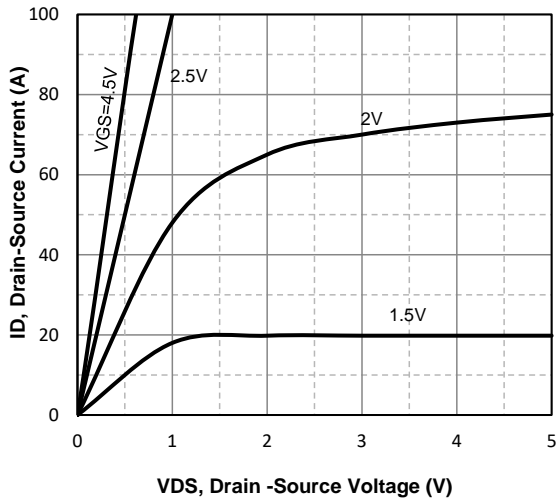
$V_{DS}$	Drain-Source Breakdown Voltage	20	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$T_J$	Maximum Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-50 to 155	$^\circ\text{C}$
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 50	A

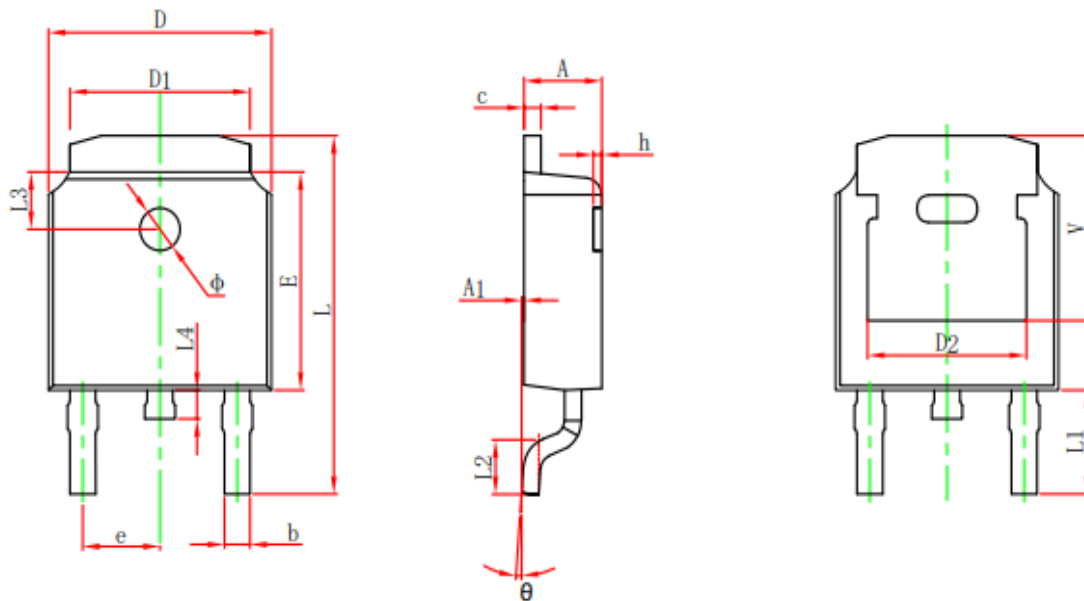
### Mounted on Large Heat Sink

$I_{DM}$	Pulse Drain Current Tested	$T_C=25^\circ\text{C}$ 200	A
$I_D$	Continuous Drain Current@ $V_{GS}=10\text{V}$	$T_C=25^\circ\text{C}$ 50	A
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 31	W
$E_{AS}$	Single pulse avalanche energy	11.25	mJ

<b>Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)</b>						
<b>Symbol</b>	<b>Parameter</b>	<b>Condition</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>	<b>Unit</b>
<b>Static Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
BV <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	20	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V	--	--	1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V	--	--	±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.4	0.75	1.2	V
R <sub>DS(on)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A	--	6.8	10	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =18A	--	8	13	
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
C <sub>ISS</sub>	Input Capacitance	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHz	--	1460	--	pF
C <sub>OSS</sub>	Output Capacitance		--	240	--	pF
C <sub>RSS</sub>	Reverse Transfer Capacitance		--	215	--	pF
<b>Switching Characteristics</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =10V, I <sub>D</sub> =25A, V <sub>GS</sub> =10V	--	20	--	nC
Q <sub>gs</sub>	Gate Source Charge		--	3	--	nC
Q <sub>gd</sub>	Gate Drain Charge		--	6.5	--	nC
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =10V, I <sub>D</sub> =10A, V <sub>GS</sub> =4.5V, R <sub>G</sub> =3Ω	--	10	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	20	--	nS
t <sub>d(off)</sub>	Turn-Off Delay Time		--	40	--	nS
t <sub>f</sub>	Turn-Off Fall Time		--	20	--	nS
<b>Source- Drain Diode Characteristics</b>						
V <sub>SD</sub>	Forward on voltage	T <sub>J</sub> =25°C, I <sub>S</sub> =20A,	--	--	1.2	V

## Typical Operating Characteristics



**TO-252 Package information**


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.	

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