Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
20V	2.8mΩ@10V	90A

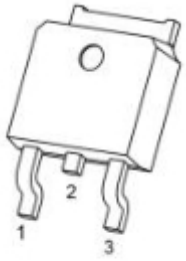
Feature

- V_{DS} =20V,I_D =90A
- $R_{DS(ON)}$ <4.5mΩ @ V_{GS}=4.5V
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

Applications

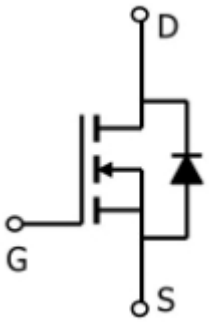
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Package

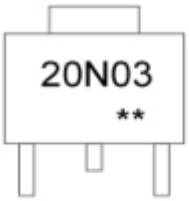


TO-252(G:1 D:2 S:3)

Circuit diagram



Marking



20N03 : Product code
** : Week code.

Absolute maximum ratings

(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±10	V
Drain Current-Continuous	I_D	90	W
Drain Current-Continuous (T_C=100℃)	$I_{D(100℃)}$	63	W
Pulsed Drain Current[1]	I_{DM}	225	A
Maximum Power Dissipation	P_D	45	W
Single Pulse Avalanche Energy	E_{AS}	205	mJ
Thermal Resistance Junction- Case	$R_{\theta JC}$	3.3	℃/ W
Operating and Storage Temperature Range	T_J, T_{STG},	-55~ +150	℃

Electrical characteristics

(T_A=25℃, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS} = 0V, I_D =250μA	20			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =20V,V_{GS} = 0V			1	uA
Gate-body leakage current	I_{GSS}	V_{GS} =±10V , V_{DS}=0V			±100	uA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	0.4	0.62	1	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} =4.5V, I_D =20A		2.8	4.5	mΩ
		V_{GS} =2.5V, I_D =15A		3.3	5	
		V_{GS} =1.8V, I_D =10A		4.7	7.5	
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS}=10V, V_{GS}=0V, f=1MHz		3935		pF
Output Capacitance	C_{oss}			701		
Reverse Transfer Capacitance	C_{rss}			333		
Switching Characteristics						
Total Gate Charge(4.5V)	Q_g	V_{GS}=4.5V, V_{DS}=10V, I_D=15A		105		nC
Gate-Source Charge	Q_{gS}			25		
Gate-Drain Charge	Q_{gd}			21		
Turn-On Delay Time	$T_{d(on)}$	V_{GS}=4.5V, V_{DD}=10V, I_D=10A, R_L=1Ω, R_{GEN}=3Ω		12		nS
Rise Time	T_r			26		
Turn-Off Delay Time	$T_{d(off)}$			35		
Fall Time	T_f			10		
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	I_S=20A, V_{GS} = 0V		0.8	1.2	V
Maximum Body-Diode Continuous Current	I_S				90	A

Notes:

1. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.

2. T_j=25℃, V_{DD}=15V, V_G=10V, L=0.5mH, Rg=25Ω

3. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design, while $R_{\theta JA}$ is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.

Typical Characteristics

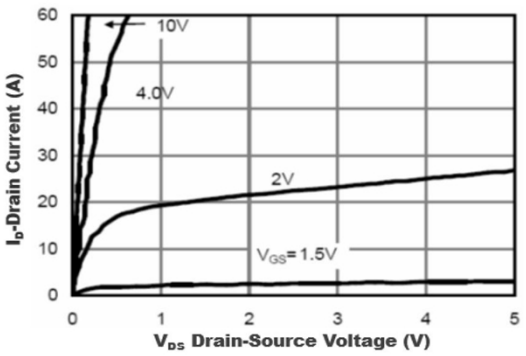


Figure1. Output Characteristics

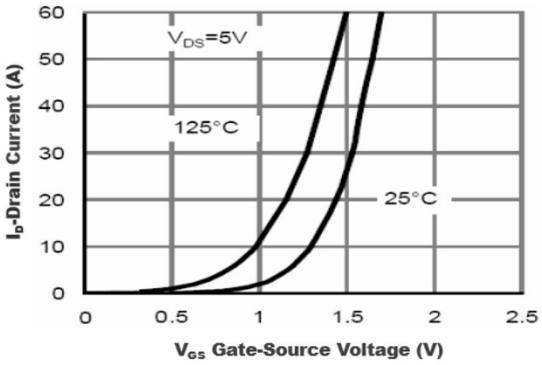


Figure2. Transfer Characteristics

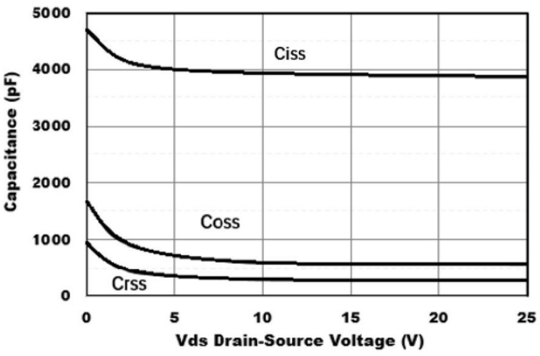


Figure3. Capacitance Characteristics

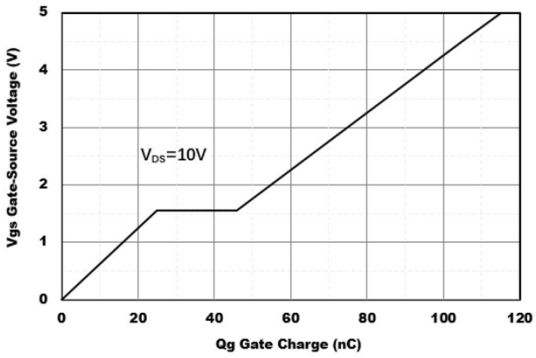


Figure4. Gate Charge

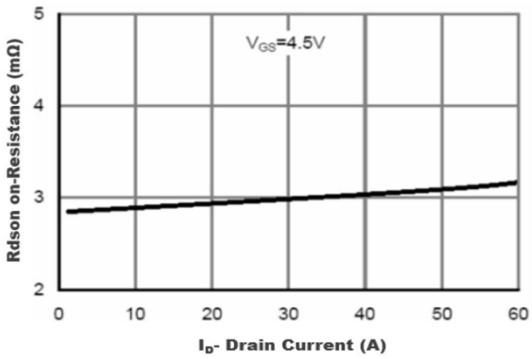


Figure5. Drain-Source on Resistance

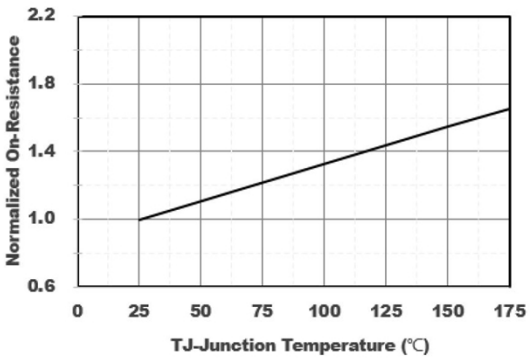


Figure6. Drain-Source on Resistance

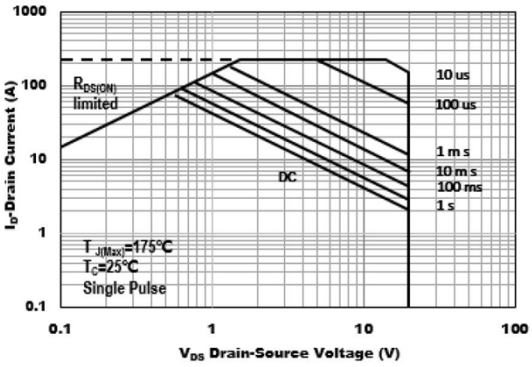


Figure7. Safe Operation Area

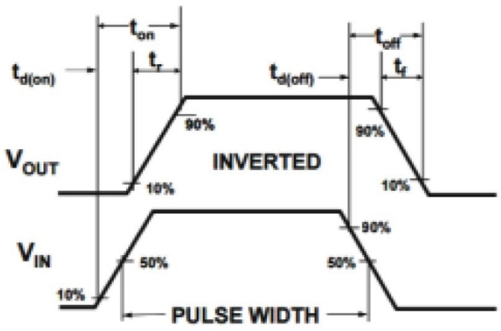
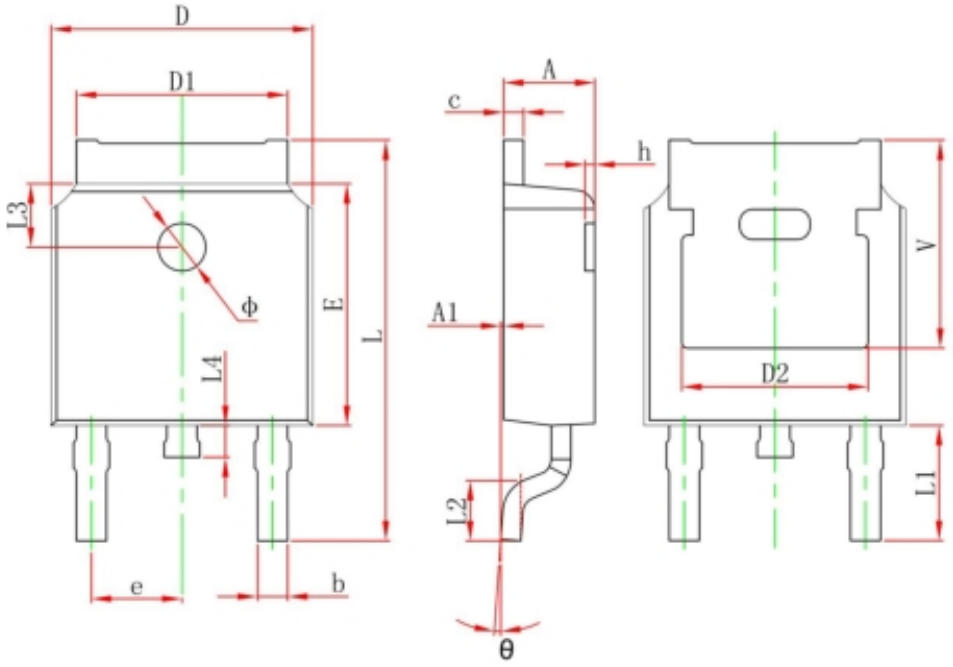


Figure8. Switching wave

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	0.660	0.860	0.026	0.034
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	9.800	10.400	0.386	0.409
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	5.350 REF.		0.211 REF.	