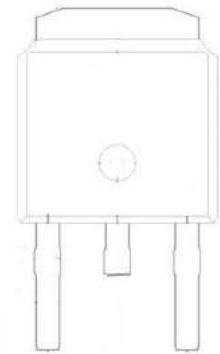
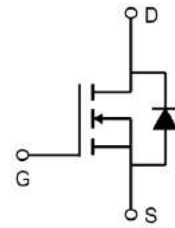


200V N-Channel Enhancement Mode MOSFET

Description

The 5N20D is silicon N-channel Enhanced VDMOSFETs, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency.



General Features

$V_{DS} = 200V, I_D = 5A$

$R_{DS(ON)} < 600m\Omega @ V_{GS} = 10V$

Application

Uninterruptible Power Supply (UPS)

Power Factor Correction (PFC)

Absolute Maximum Ratings ($T_c = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Value	Unit
VDSS	Drain-Source Voltage ($V_{GS} = 0V$)	200	V
I_D	Continuous Drain Current	5	A
IDM	Pulsed Drain Current	20	A
VGSS	Gate-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy	45	mJ
IAR	Avalanche Current	3	A
E_{AR}	Repetitive Avalanche Energy	3.2	mJ
P_D	Power Dissipation ($T_c = 25^\circ C$)	46	W
RthJC	Thermal Resistance, Junction-to-Case	2.7	$^\circ C/W$
RthJA	Thermal Resistance, Junction-to-Ambient	60	$^\circ C/W$
T_J, T_{stg}	Operating Junction and Storage Temperature Range	-55~+150	$^\circ C$

200V N-Channel Enhancement Mode MOSFET
Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	200	221	--	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} = 200V, V _{GS} = 0V, T _J = 25°C	--	--	5	μA
IDSS		V _{DS} = 160V, V _{GS} = 0V, T _J = 125°C	--	--	100	
IGSS	Gate-Source Leakage	V _{GS} = ±20V	--	--	±100	nA
VGS(th)	Gate-Source Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	2.5	3.1	4.0	V
RDS(on)	Drain-Source On-Resistance (Note3)	V _{GS} = 10V, I _D = 2.5A	--	530	600	mΩ
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 25V, f = 1.0MHz	--	228	--	pF
C _{oss}	Output Capacitance		--	48	--	
C _{rss}	Reverse Transfer Capacitance		--	17	--	
Q _g	Total Gate Charge	V _{DD} = 160V, I _D = 5.0A, V _{GS} = 10V	--	18	--	nC
Q _{gs}	Gate-Source Charge		--	1.5	--	
Q _{gd}	Gate-Drain Charge		--	9.5	--	
td(on)	Turn-on Delay Time	V _{DD} = 100V, I _D = 5.0A, R _G = 25 Ω	--	10	--	ns
t _r	Turn-on Rise Time		--	19	--	
td(off)	Turn-off Delay Time		--	43	--	
t _f	Turn-off Fall Time		--	32	--	
I _S	Continuous Body Diode Current	T _C = 25 °C	--	--	5	A
ISM	Pulsed Diode Forward Current		--	--	20	
V _{SD}	Body Diode Voltage	T _J = 25°C, I _{SD} = 5A, V _{GS} = 0V	--	--	1.4	V
t _{rr}	Reverse Recovery Time	V _{GS} = 0V, I _S = 5A, di _F /dt = 100A/μs	--	160	--	ns
Q _{rr}	Reverse Recovery Charge		--	1.5	--	μC

Notes:

- 1、Repetitive Rating: Pulse width limited by maximum junction temperature
- 2、I_{AS} = 3A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25 °C
- 3、Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

200V N-Channel Enhancement Mode MOSFET

Typical Characteristics

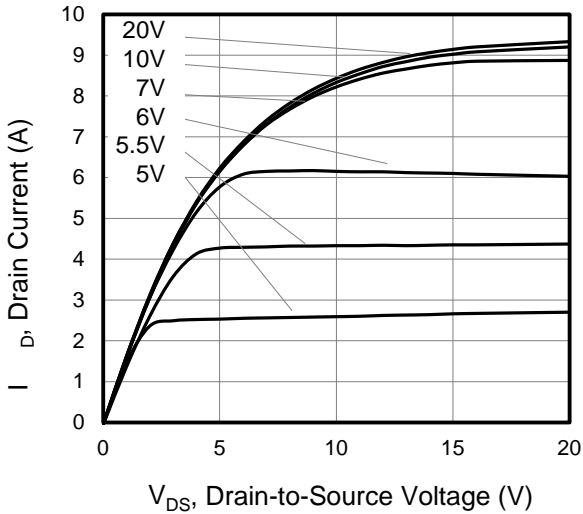


Figure 1. Output Characteristics ($T_J = 25^\circ\text{C}$)

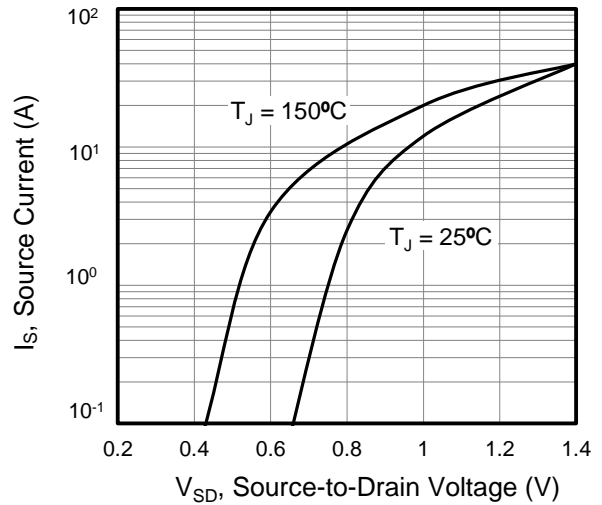


Figure 2. Body Diode Forward Voltage

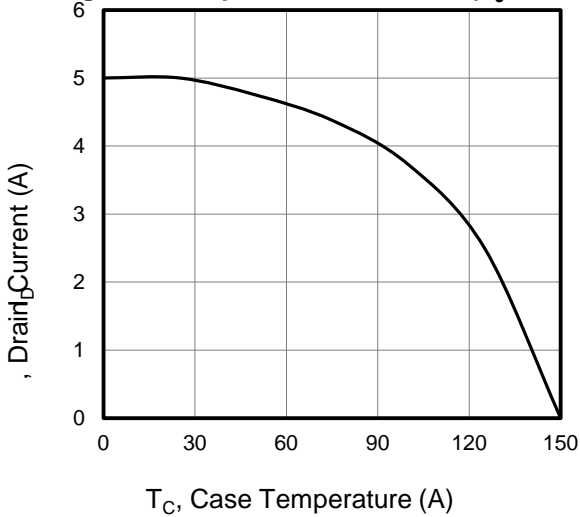


Figure 3. Drain Current vs. Temperature

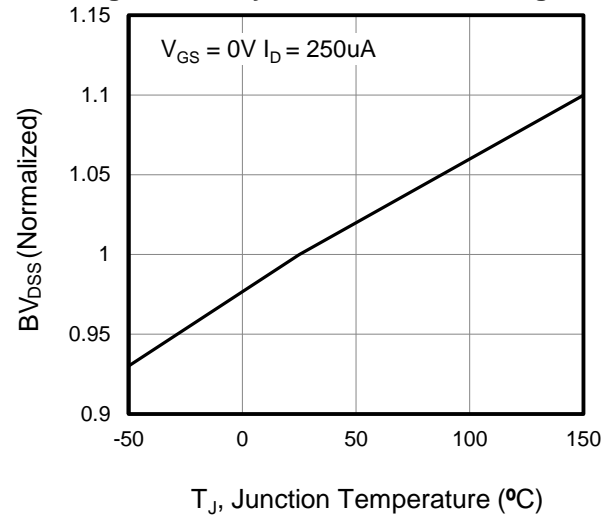


Figure 4. BV_{DSS} Variation vs. Temperature

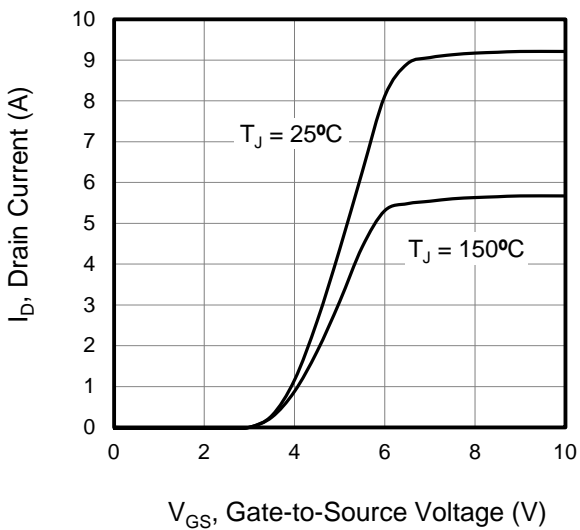


Figure 5. Transfer Characteristics

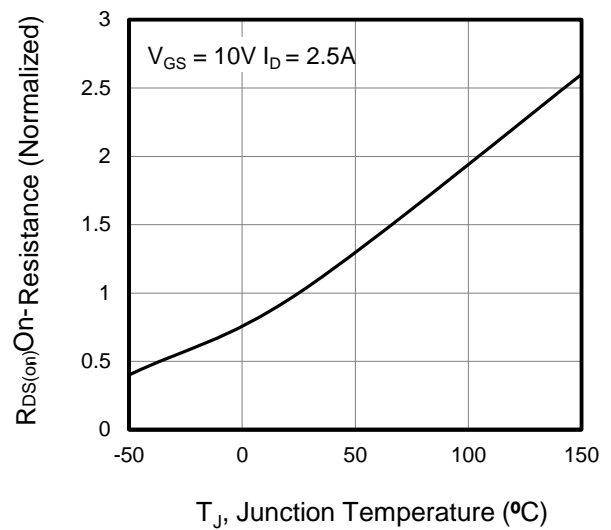


Figure 6. On-Resistance vs. Temperature

200V N-Channel Enhancement Mode MOSFET

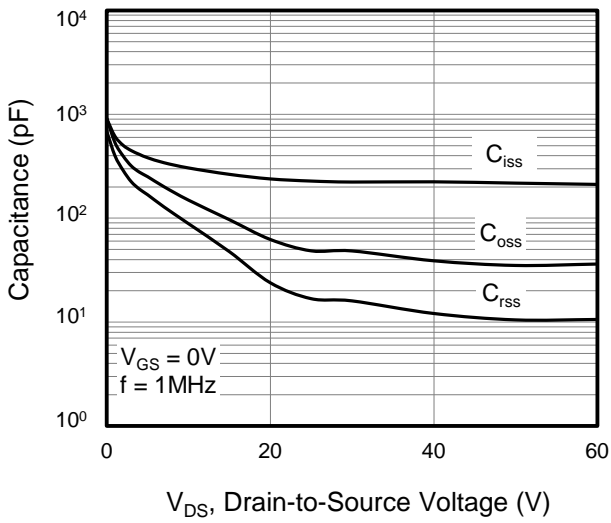


Figure 7. Capacitance

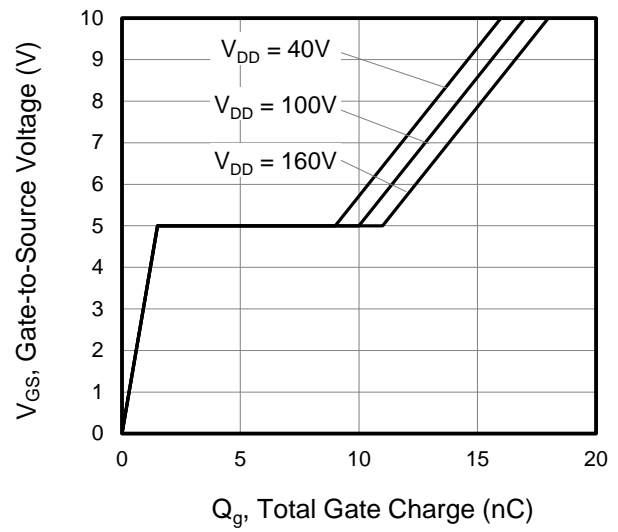


Figure 8. Gate Charge

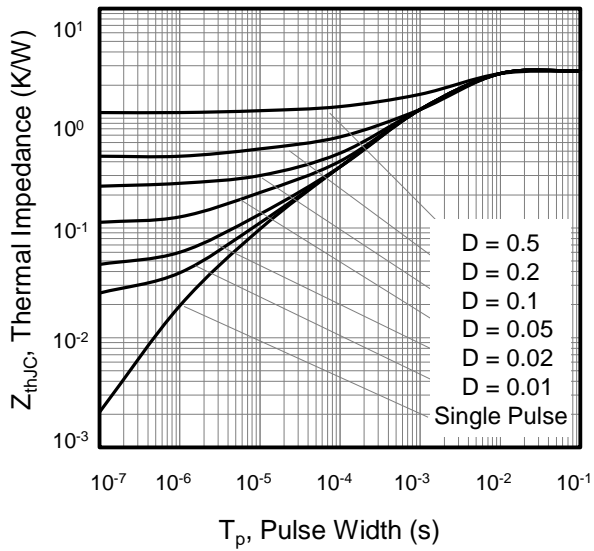
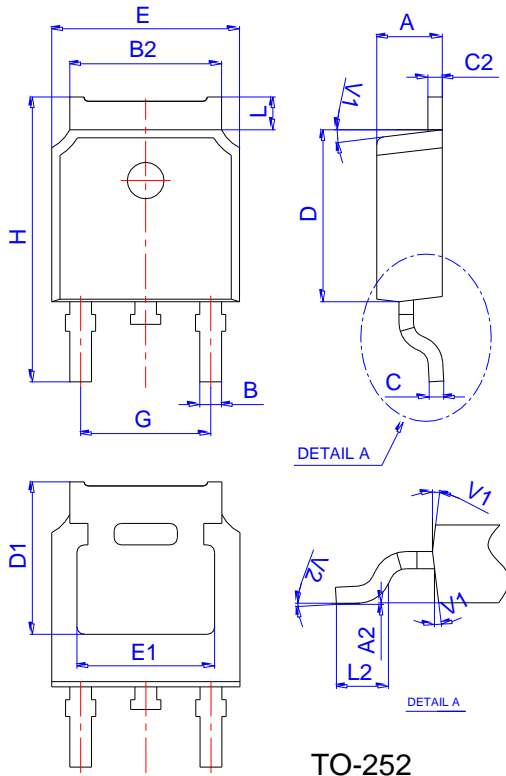


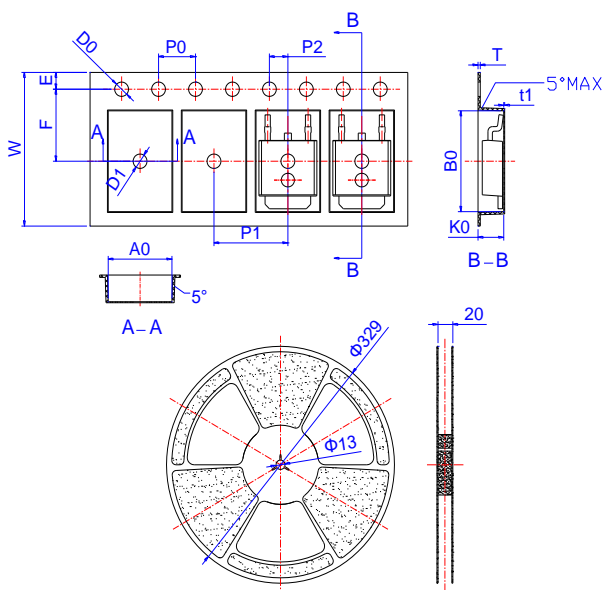
Figure 10. Transient Thermal Impedance

Package Mechanical Data



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Reel Specification-TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583