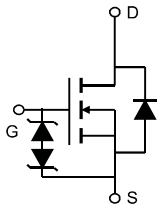
RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

RMA7N20ED1

N-Channel Trench MOSFET

Description

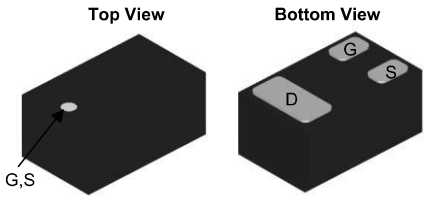
The RMA7N20ED1 designed by the trench processing techniques to achieve extremely low on-resistance. And fast switching speed and improved transfer effective .



Schematic diagram

General Features

- V_{DS} = 20V,I_D = 0.7A
  $R_{DS(ON)}$ < 0.26Ω @ V_{GS}=2.5V
  $R_{DS(ON)}$ < 0.22Ω @ V_{GS}=4.5V
- Low On-Resistance
- High fast switching
- Halogen-free



DFN1006-3

Application

- Load switch

Package Marking And Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
1606	RMA7N20ED1	DFN1006-3	Ø180mm	8 mm	

Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±8	V
Continuous Drain Current (T_J =150℃)	T_c =25℃	I_D	0.7	A
	T_c =100℃		0.5	
Drain Current-Pulsed (Note 1)		I_{DM}	3	A
Maximum Power Dissipation		P_D	0.55	W
Diode Continuous Forward Current		I_S	0.7	A
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-50 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	100	℃/W

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=250μA	20	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current (Tc=25℃)	V_{DS}=20V,V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current (Tc=125℃)	V_{DS}=20V,V_{GS}=0V	--	--	100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±8 V,V_{DS}=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	0.4	0.8	1.2	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=2.5V,I_D=0.3A	--	210	260	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=4.5V, I_D=0.5A	--	180	220	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=10V,V_{GS}=0V, f=1MHz	--	40	--	pF
C_{oss}	Output Capacitance		--	15	--	pF
C_{rss}	Reverse Transfer Capacitance		--	6.5	--	pF
Q_g	Total Gate Charge	V_{DS}=10V,I_D=0.5A, V_{GS}=4.5V	--	1.1	--	nC
Q_{gs}	Gate-Source Charge		--	0.3	--	nC
Q_{gd}	Gate-Drain Charge		--	0.2	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=10V, I_D=0.3A, R_G=6Ω, V_{GS}=4.5V, RL=5Ω,	--	2.2	--	nS
t_r	Turn-on Rise Time		--	4	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	18	--	nS
t_f	Turn-Off Fall Time		--	9	--	nS
Source- Drain Diode Characteristics						
I_{SD}	Source-drain current(Body Diode)	T_C=25℃	--	--	0.5①	A
I_{SDM}	Pulsed Source-drain current (Body Diode)		--	--	3①	A
V_{SD}	Forward on voltage	T_j=25℃,I_{SD}=0.5A, V_{GS}=0V	--	0.75	1.2	V

RATING AND CHARACTERISTICS CURVES (RMA7N20ED1)

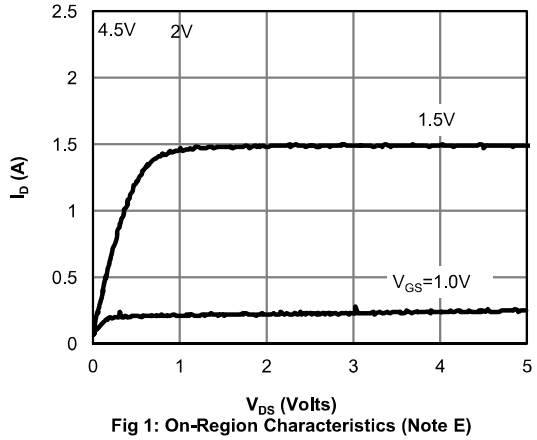


Fig 1: On-Region Characteristics (Note E)

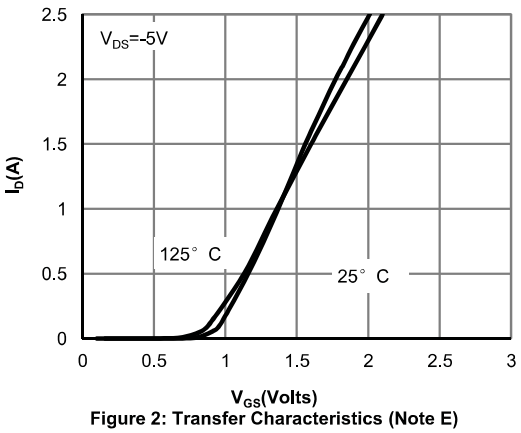


Figure 2: Transfer Characteristics (Note E)

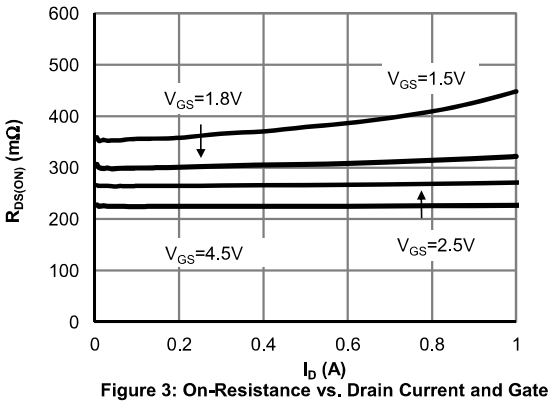


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

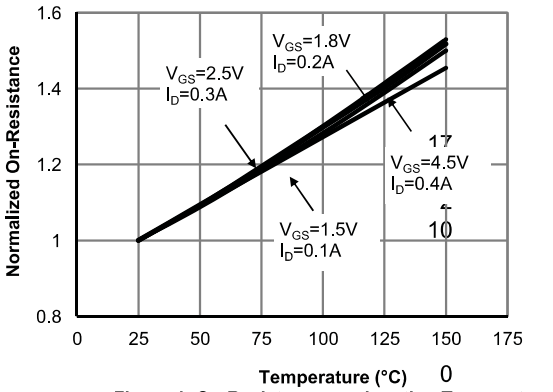


Figure 4: On-Resistance vs. Junction Temperature (Note E)

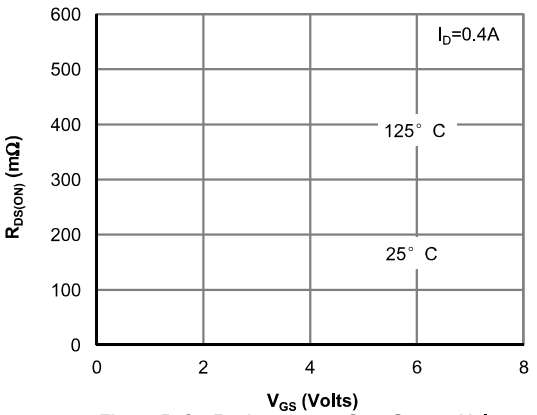


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

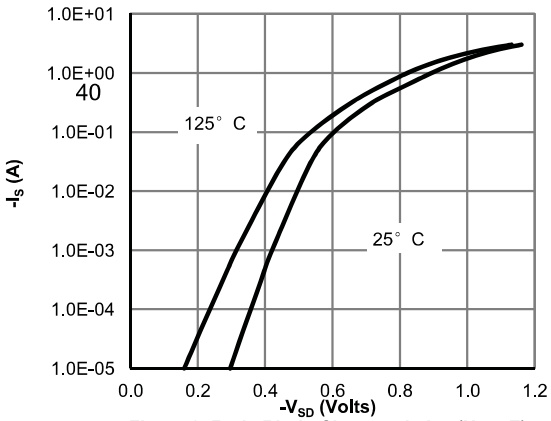


Figure 6: Body-Diode Characteristics (Note E)

RATING AND CHARACTERISTICS CURVES (RMA7N20ED1)

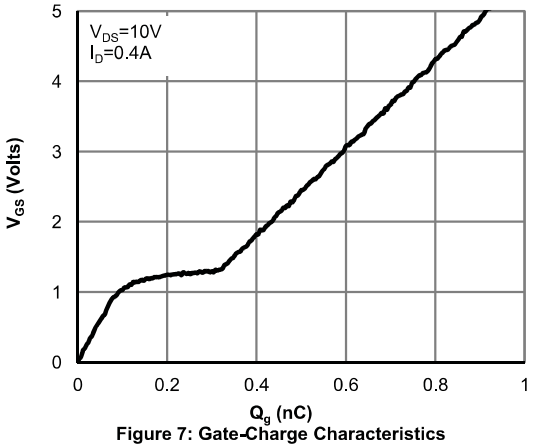


Figure 7: Gate-Charge Characteristics

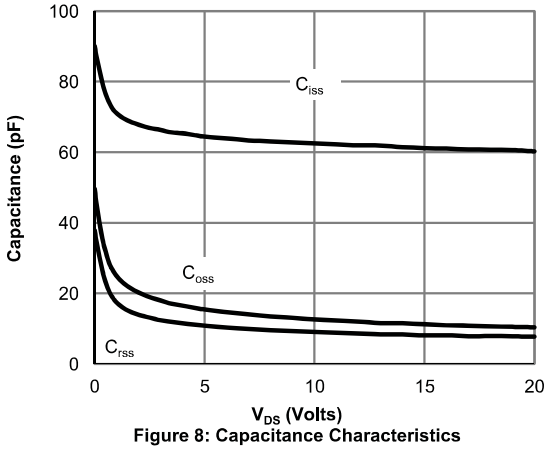


Figure 8: Capacitance Characteristics

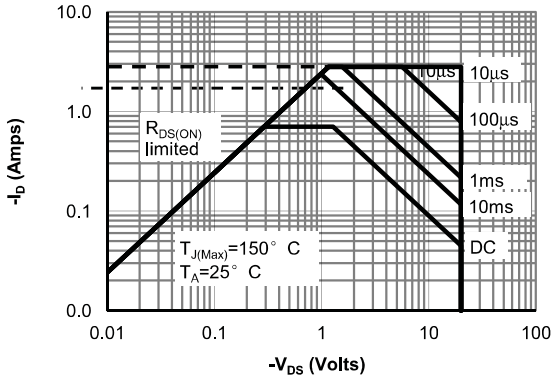


Figure 9: Maximum Forward Biased Safe Operating Area (Note B)

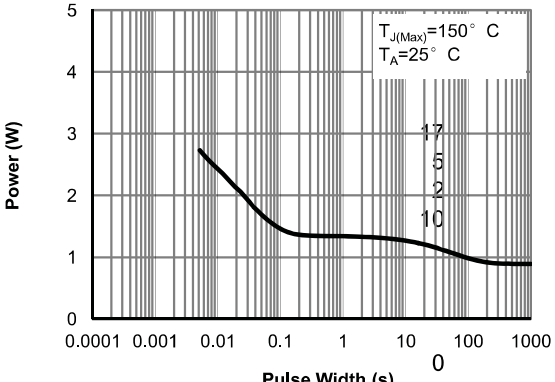


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note B)

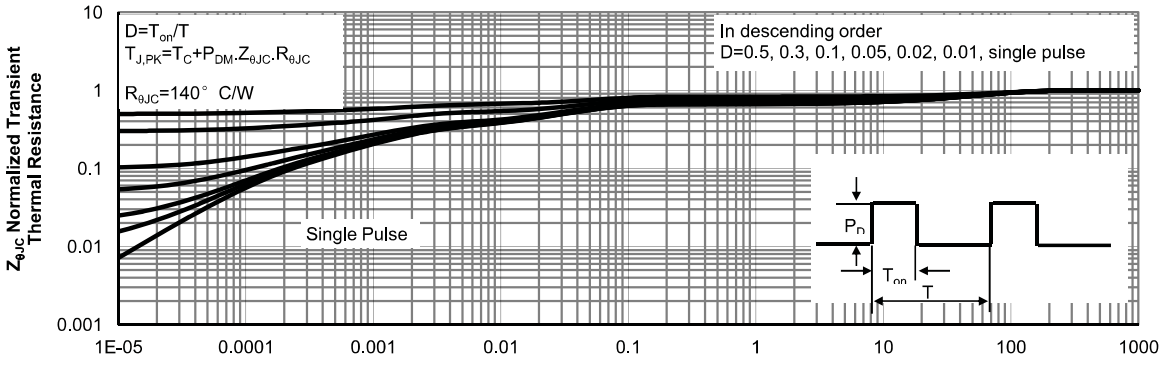
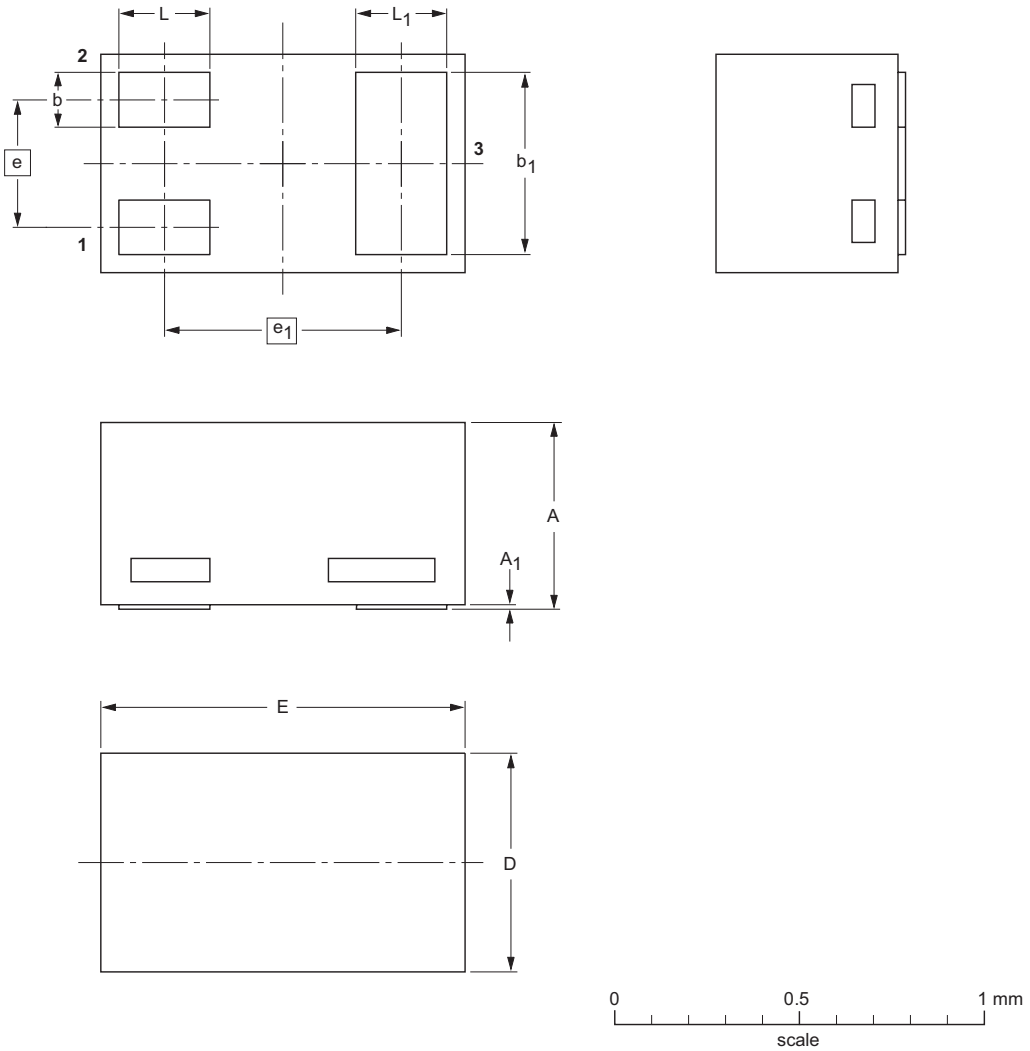


Figure 11: Normalized Maximum Transient Thermal Impedance (Note B)

DFN1006-3 Package Information



DIMENSIONS (mm are the original dimensions)

UNIT	A(1)	A1 max.	b	b1	D	E	e	e1	L	L1
mm	0.50 0.46	0.03	0.20 0.12	0.55 0.47	0.62 0.55	1.02 0.95	0.35	0.65	0.30 0.22	0.30 0.22

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