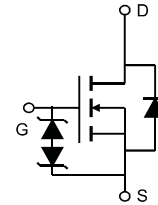


N-Channel Trench MOSFET

Description

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



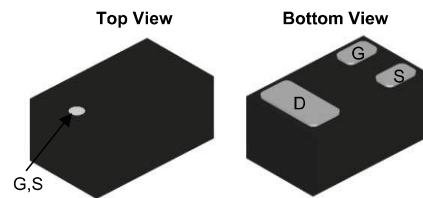
Schematic diagram

General Features

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

Application

- Load switch



DFN1006-3

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 8	V
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	I_D	$T_c = 25^\circ\text{C}$	0.7
		$T_c = 100^\circ\text{C}$	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	$^\circ\text{C}$

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient ^(Note 2)	$R_{\theta JA}$	100	$^\circ\text{C/W}$
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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 (T _c =25°C)	V _{DS} =20V, V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current (T _c =125°C)	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, R _L =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°C	--	--	0.5 ^①	A
I _{SDM}	Pulsed Source-drain current (Body Diode)		--	--	3 ^①	A
V _{SD}	Forward on voltage	T _J =25°C, I _{SD} =0.5A, V _{GS} =0V	--	0.75	1.2	V

RATING AND CHARACTERISTICS CURVES (RMA7N20ED1)

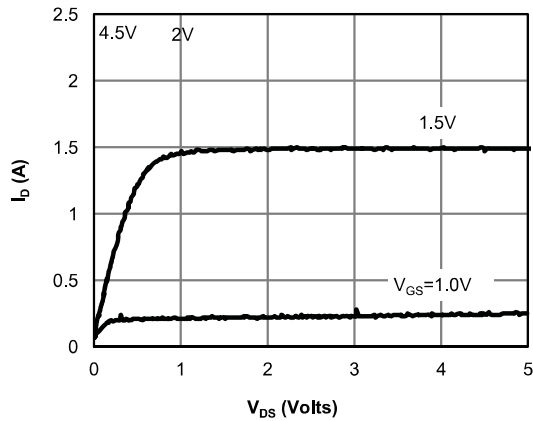


Figure 1: On-Region Characteristics (Note E)

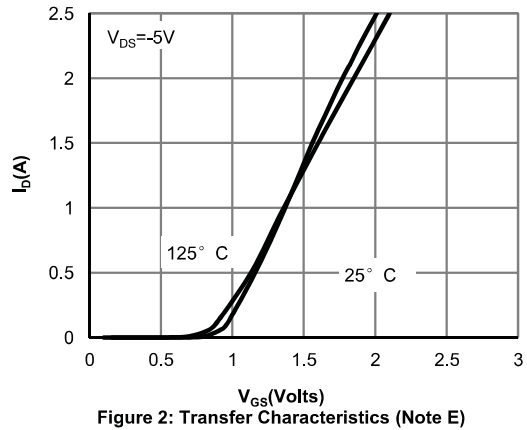


Figure 2: Transfer Characteristics (Note E)

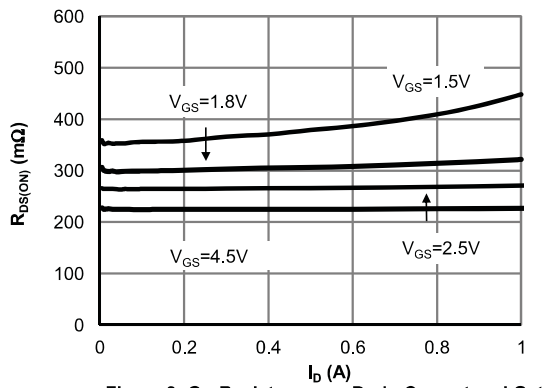


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

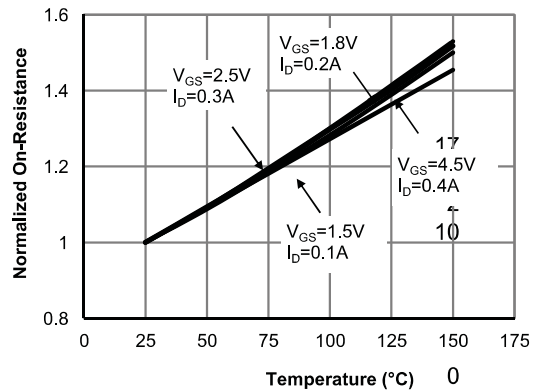


Figure 4: On-Resistance vs. Junction Temperature (Note E)

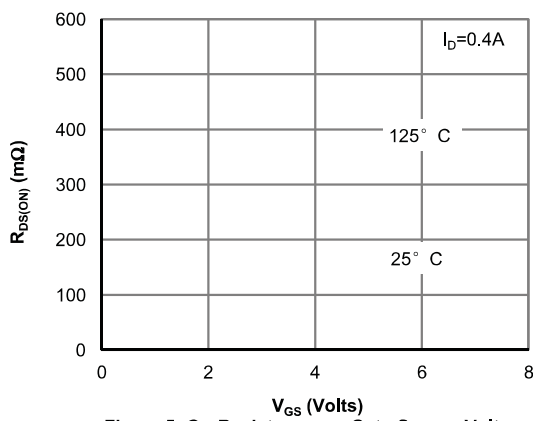


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

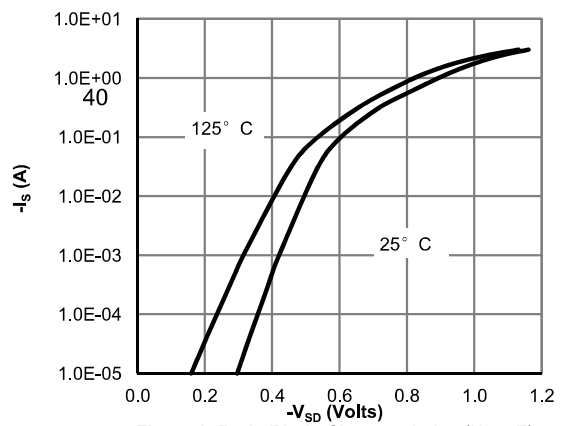


Figure 6: Body-Diode Characteristics (Note E)

RATING AND CHARACTERISTICS CURVES (RMA7N20ED1)

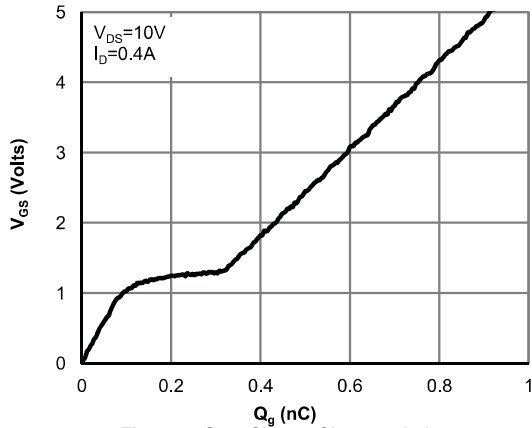


Figure 7: Gate-Charge Characteristics

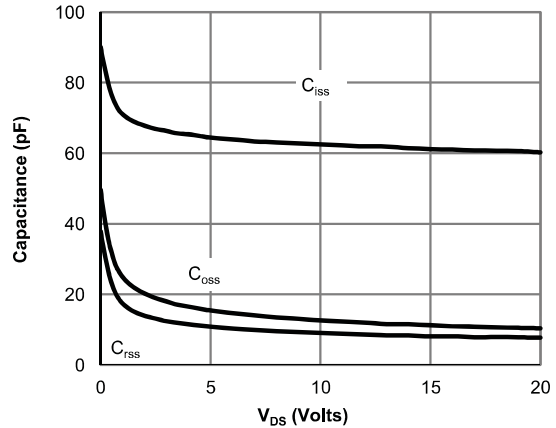


Figure 8: Capacitance Characteristics

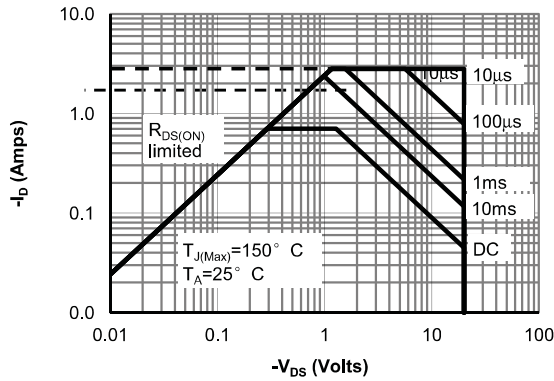


Figure 9: Maximum Forward Biased Safe Operating Area (Note B)

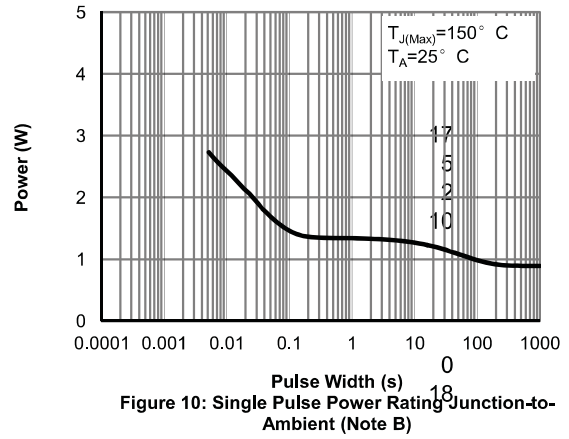


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note B)

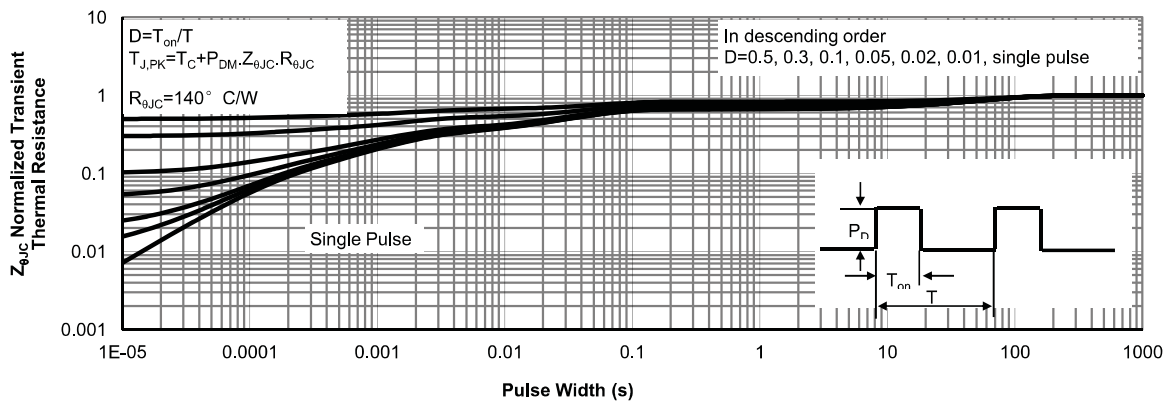
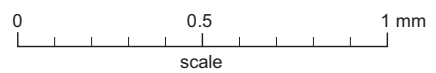
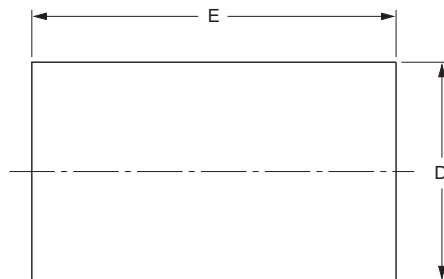
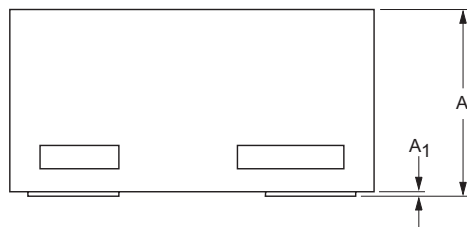
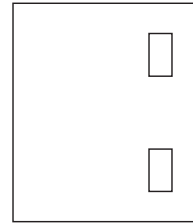
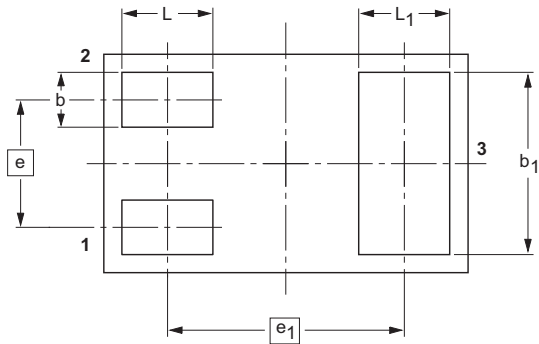


Figure 11: Normalized Maximum Transient Thermal Impedance (Note B)

DFN1006-3 Package Information



DIMENSIONS (mm are the original dimensions)

UNIT	A ⁽¹⁾	A ₁ max.	b	b ₁	D	E	e	e ₁	L	L ₁
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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