

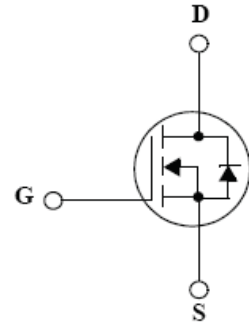
## N-Channel MOSFET 600V, 0.4 A, 8.5 Ω

### Features

- $V_{DS} = 600V$
- $I_D = 0.4A$  @  $V_{GS} = 10V$
- $R_{DS(ON)} \leq 8.5\Omega$  @  $V_{GS} = 10V$

### Applications

- Power supply
- Battery charger
- Ballast



### Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit	
Drain-Source Voltage	$V_{DSS}$	600	V	
Gate-Source Voltage	$V_{GSS}$	±30	V	
Continuous Drain Current	$I_D$	$T_C=25^\circ C$	0.4	A
		$T_C=100^\circ C$	0.25	A
Pulsed Drain Current <sup>(1)</sup>	$I_{DM}$	1.6	A	
Power Dissipation	$P_D$	$T_C=25^\circ C$	2.5	W
		Derate above 25 °C	0.02	W/°C
Peak Diode Recovery $dv/dt$ <sup>(3)</sup>	$Dv/dt$	4.5	V/ns	
Single Pulse Avalanche Energy <sup>(4)</sup>	$E_{AS}$	30	mJ	
Junction and Storage Temperature Range	$T_J, T_{stg}$	-55~150	°C	

### Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Lead <sup>(1)</sup>	$R_{\theta JL}$	50	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	140	

### Ordering Information

Part Number	Temp. Range	Package	Packing	RoHS Status
RMA4N60092	-55~150°C	TO-92	AMMOPAK	Halogen Free

## Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D = 250\mu A, V_{GS} = 0V$	600	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	3.0	-	5.0	
Drain Cut-Off Current	$I_{DSS}$	$V_{DS} = 600V, V_{GS} = 0V$	-	-	1	$\mu A$
Gate Leakage Current	$I_{GSS}$	$V_{GS} = \pm 30V, V_{DS} = 0V$	-	-	100	nA
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 0.2A$		7.0	8.5	$\Omega$
Forward Transconductance	$g_{fs}$	$V_{DS} = 30V, I_D = 0.4A$	-	0.75	-	S

### Dynamic Characteristics

Total Gate Charge	$Q_g$	$V_{DS} = 600V, I_D = 1.0A, V_{GS} = 10V^{(3)}$	-	3.5		nC
Gate-Source Charge	$Q_{gs}$		-	1.4		
Gate-Drain Charge	$Q_{gd}$		-	1.4		
Input Capacitance	$C_{iss}$	$V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz$	-	130		pF
Reverse Transfer Capacitance	$C_{riss}$		-	18.5		
Output Capacitance	$C_{oss}$		-	1.0		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 300V, I_D = 1.0A, R_G = 25\Omega^{(3)}$	-	7.5		ns
Rise Time	$t_r$		-	17		
Turn-Off Delay Time	$t_{d(off)}$		-	8.5		
Fall Time	$t_f$		-	22		

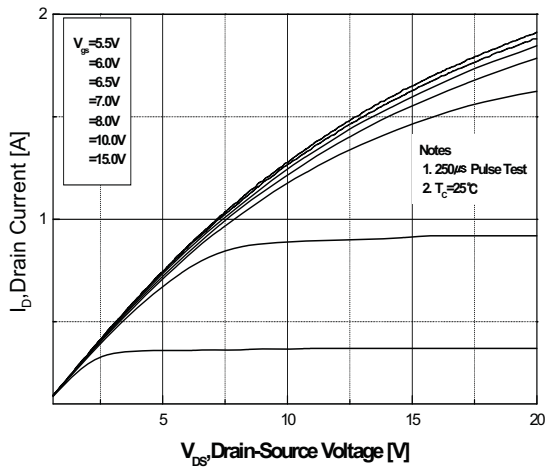
### Drain-Source Body Diode Characteristics

Maximum Continuous Drain to Source Diode Forward Current	$I_S$		-	0.4	-	A
Source-Drain Diode Forward Voltage	$V_{SD}$	$I_S = 0.4A, V_{GS} = 0V$	-		1.4	V
Body Diode Reverse Recovery Time	$t_{rr}$	$I_F = 1.0A, di/dt = 100A/\mu s^{(3)}$	-	200		ns
Body Diode Reverse Recovery Charge	$Q_{rr}$		-	480		nC

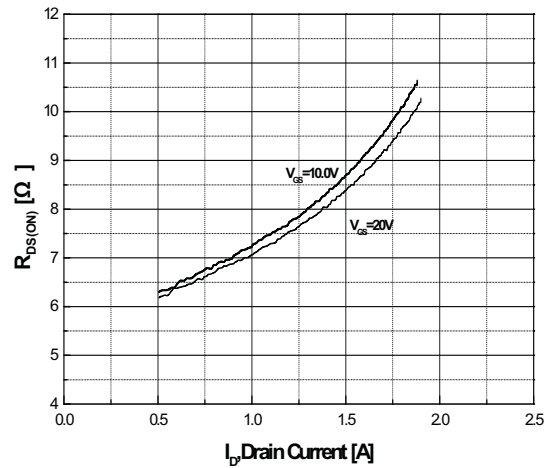
Note :

- $R_{\theta JL}$  point is the drain lead.
- Pulse test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ , pulse width limited by junction temperature  $T_J(MAX) = 150^\circ C$
- $I_{SD} \leq 1.0A$ ,  $di/dt \leq 200A/\mu s$ ,  $V_{DD} = 50V$ ,  $R_g = 25\Omega$ , Starting  $T_J = 25^\circ C$
- $L = 55mH$ ,  $I_{AS} = 1.0A$ ,  $V_{DD} = 50V$ ,  $R_g = 25\Omega$ , Starting  $T_J = 25^\circ C$

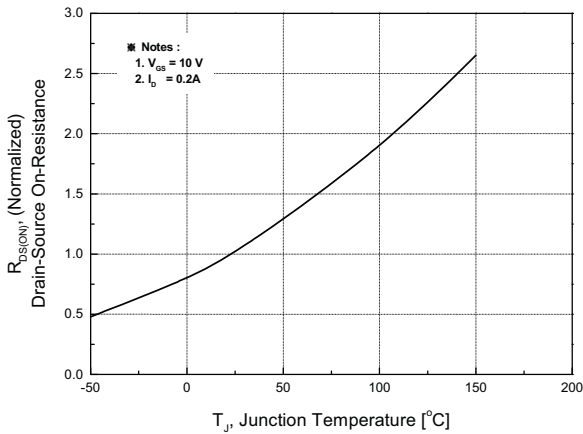
# RATING AND CHARACTERISTICS CURVES (RMA4N60092)



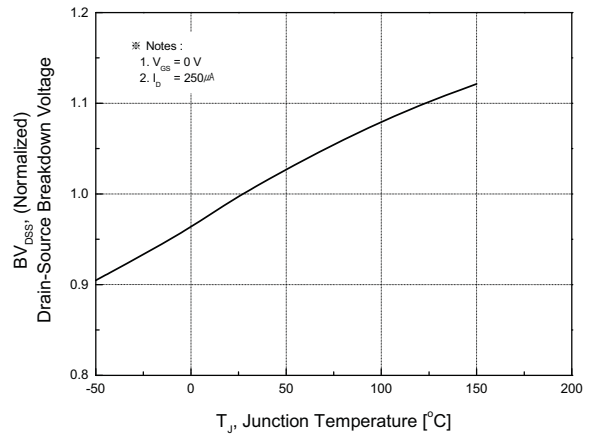
**Fig.1 On-Region Characteristics**



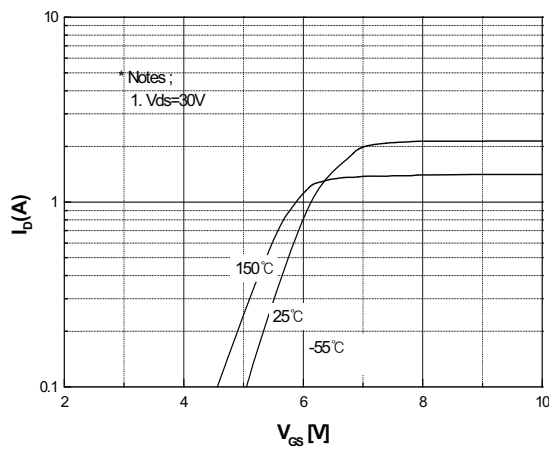
**Fig.2 On-Resistance Variation with Drain Current and Gate Voltage**



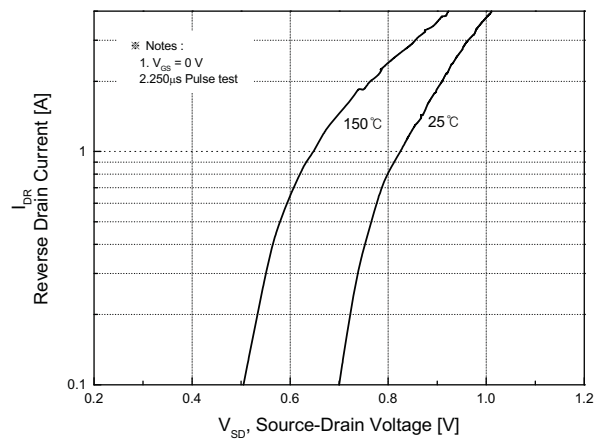
**Fig.3 On-Resistance Variation with Temperature**



**Fig.4 Breakdown Voltage Variation vs. Temperature**

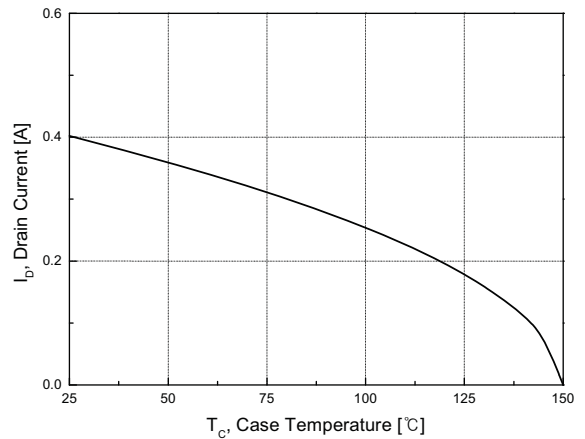
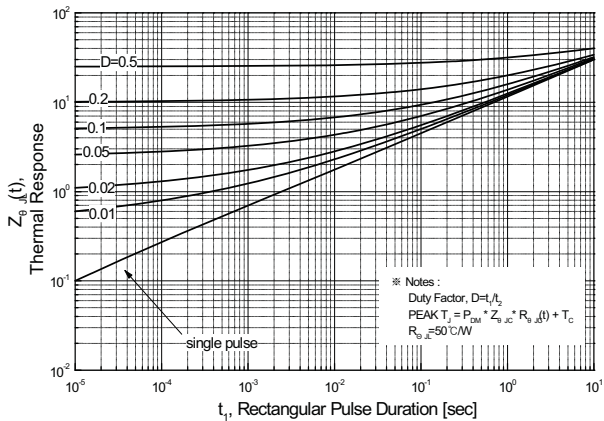
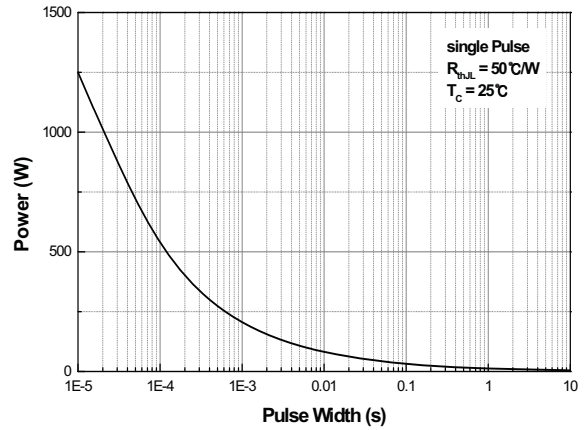
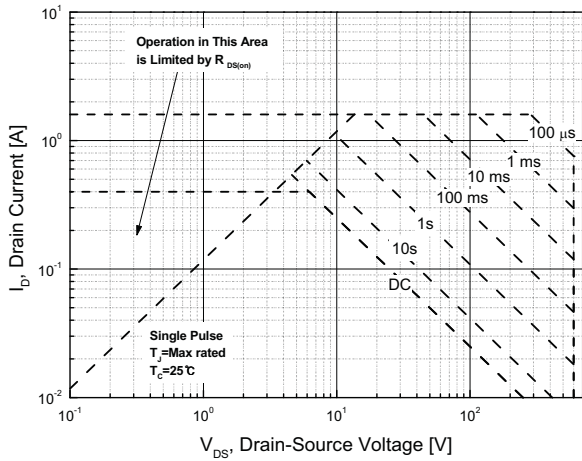
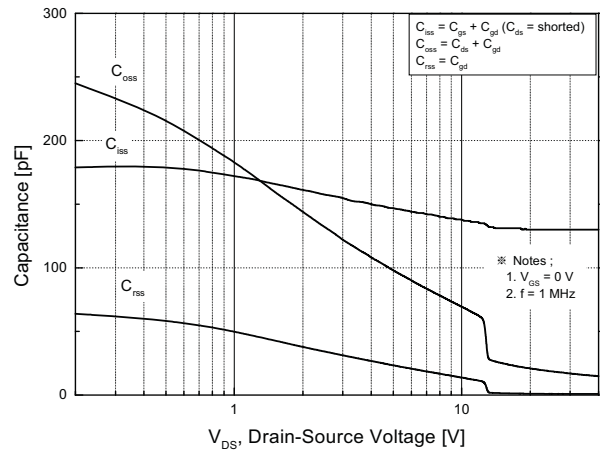
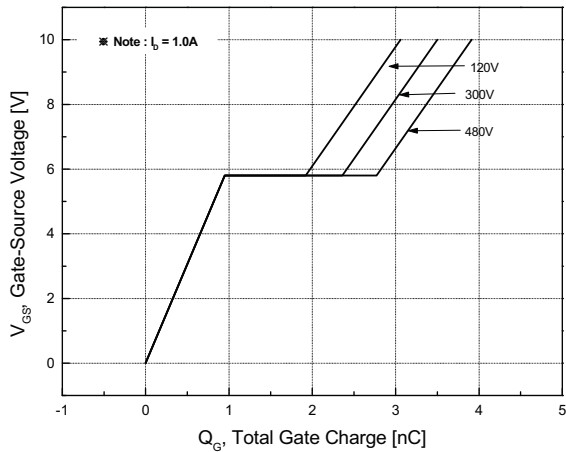


**Fig.5 Transfer Characteristics**



**Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature**

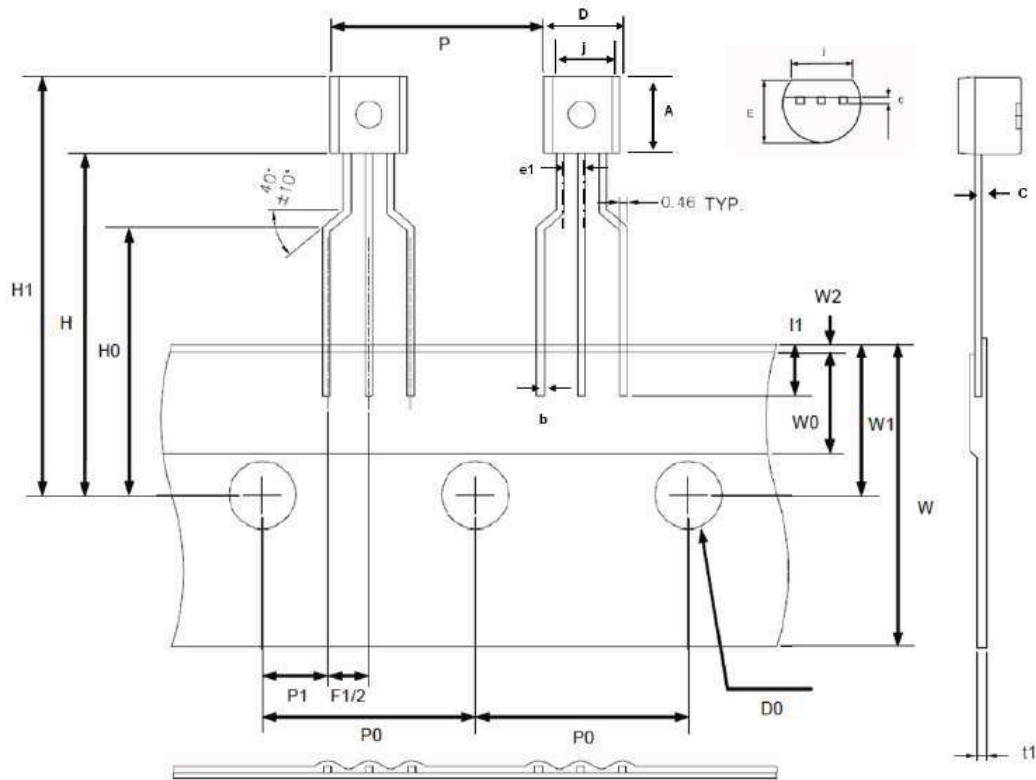
# RATING AND CHARACTERISTICS CURVES (RMA4N60092)



# Physical Dimensions

## TO-92-3L, AMMO Packing

Dimensions are in millimeters unless otherwise specified



Symbol	Min	Max
A	4.32	5.34
b	0.36	0.56
c	0.36	0.52
D	4.43	5.20
D0	3.70	4.30
E		3.86
e1	1.07	1.47
I1	2.50	
F1/F2	2.40	2.94
H		27.68
H0		20.82
H1		32.00
j	3.40	
P	11.70	13.70
P0	12.40	13.00
P1	3.35	4.35
T1	0.38	0.69
W	17.50	19.00
W0	5.50	6.50
W1	8.50	9.80
W2		0.90

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