RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

RM4P30S6

P-Ch 30V Fast Switching MOSFETs

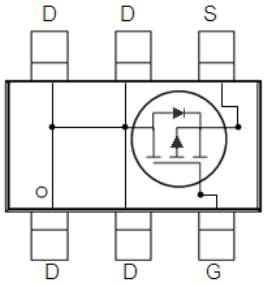
Description

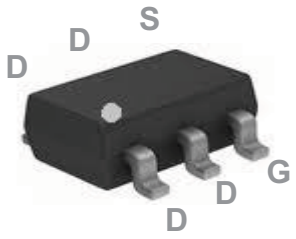
The RM4P30S6 is the high cell density trenched P-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications.

The RM4P30S6 meet the RoHS and Green Product requirement, with full function reliability approved.

- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology
- Halogen-free
- P/N suffix V means AEC-Q101 qualified, e.g:RM4P30S6V

Pin Configuration





SOT-23-6 top view

Product Summary

BVDSS	RDS ON	ID
-30V	52mΩ	-3.9A

Package Marking And Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
4P30	RM4P30S6	SOT-23-6	Ø180mm	8 mm	3000 units

Absolute Maximum Ratings

Parameter	Symbol	Value		Unit
		10s	Steady State	
Drain-Source Voltage	V_{DS}	-30		V
Gate-Source Voltage	V_{GS}	±20		V
Continuous Drain Current, V_{GS} @ -10V[1]	I_D@T_A=25℃	-4.5	-3.9	A
Continuous Drain Current, V_{GS} @ -10V[1]	I_D@T_A=70℃	-3.5	-3.1	A
Pulsed Drain Current[2]	I_{DM}	-20		A
Total Power Dissipation[3]	P_D@T_A=25℃	1.5	1.1	W
Total Power Dissipation[3]	P_D@T_A=70℃	0.94	0.73	W
Storage Temperature Range	T_{STG}	-55 to 150		℃
Operating Junction Temperature Range	T_J	-55 to 150		℃

Thermal Data

Parameter	Symbol	Type	Max	Unit
Thermal Resistance Junction Ambient [1]	$R_{\theta JA}$		110	℃/W
Thermal Resistance Junction-Ambient [1] (t ≤10s)	$R_{\theta JA}$	---	85	℃/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	---	70	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=-250uA	-30	---	---	V
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	V_{GS}=-10V , I_D=-3A	---	42	52	mΩ
		V_{GS}=-4.5V , I_D=-1.5A	---	75	90	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =-250uA	-1.2	-1.6	-2.5	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-24V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-24V , V_{GS}=0V , T_J=55℃	---	---	-5	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Forward Transconductance	gfs	V_{DS}=-5V , I_D=-3A	---	11	---	S
Total Gate Charge (-4.5V)	Q_g	V_{DS}=-15V , V_{GS}=-4.5V , I_D=-3A	---	6.4	9.0	nC
Gate-Source Charge	Q_{gs}		---	2.3	3.2	
Gate-Drain Charge	Q_{gd}		---	1.9	2.7	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=-15V , V_{GS}=-10V , R_G=3.3Ω , I_D=-3A	---	2.8	5.6	ns
Rise Time	T_r		---	8.4	15.1	
Turn-Off Delay Time	$T_{d(off)}$		---	39	78.0	
Fall Time	T_f		---	6	12.0	
Input Capacitance	C_{iss}	V_{DS}=-15V , V_{GS}=0V , f=1MHz	---	583	816	pF
Output Capacitance	C_{oss}		---	100	140	
Reverse Transfer Capacitance	C_{rss}		---	80	112	

Diode Characteristics

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Continuous Source Current[1,4]	I_S	V_G=V_D=0V , Force Current	---	---	-2	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=-1A , T_J=25℃	---	---	-1.2	V
Reverse Recovery Time	t_{rr}	I_F=-3A , dI/dt=100A/μs , T_J=25℃	---	7.8	---	nS
Reverse Recovery Charge	Q_{rr}		---	2.5	---	nC

Note :
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The power dissipation is limited by 150℃ junction temperature
4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

RATING AND CHARACTERISTICS CURVES (RM4P30S6)

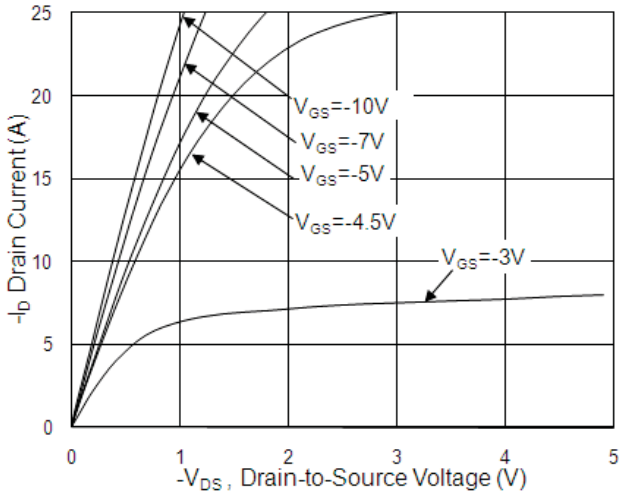


Fig.1 Typical Output Characteristics

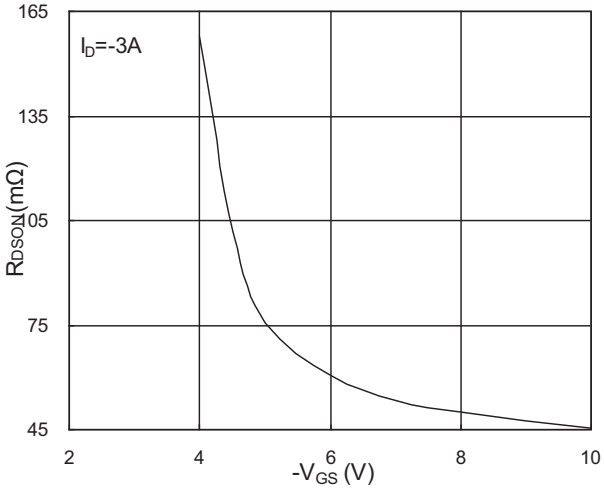


Fig.2 On-Resistance vs G-S Voltage

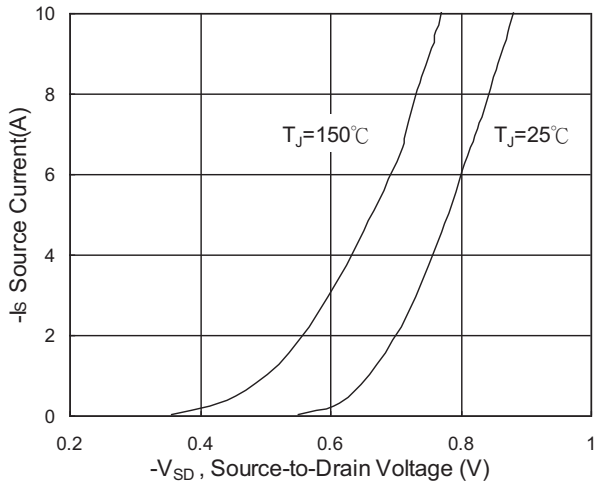


Fig.3 Source Drain Forward Characteristics

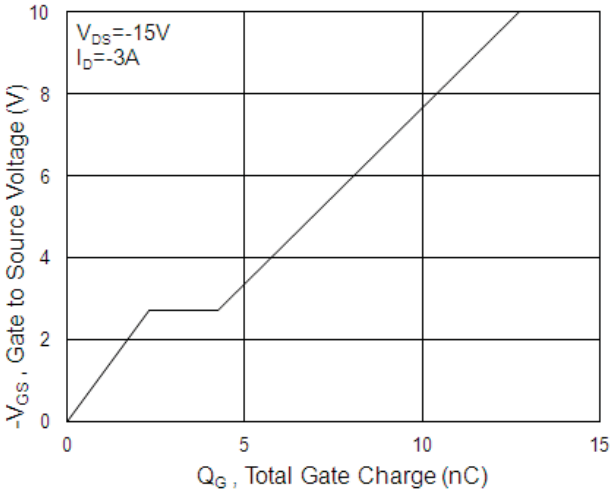


Fig.4 Gate-Charge Characteristics

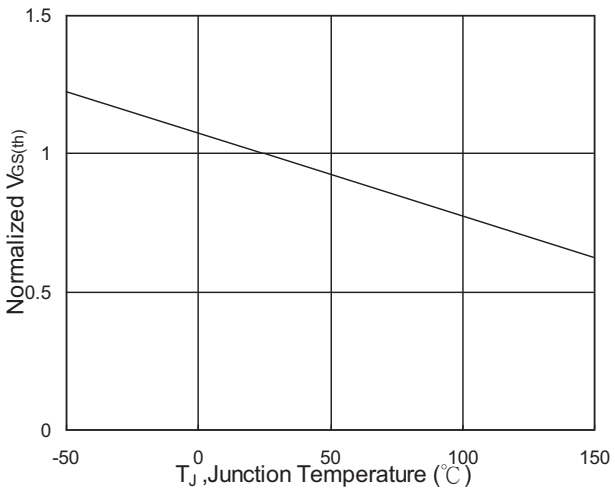


Fig.5 Normalized $V_{GS(th)}$ vs T_J

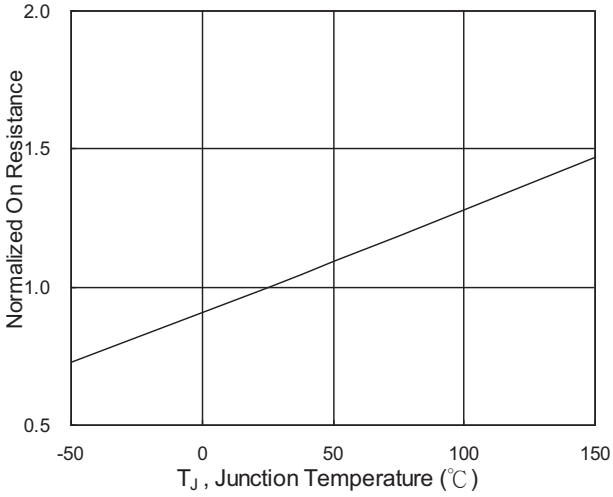


Fig.6 Normalized R_{DSON} vs T_J

RATING AND CHARACTERISTICS CURVES (RM4P30S6)

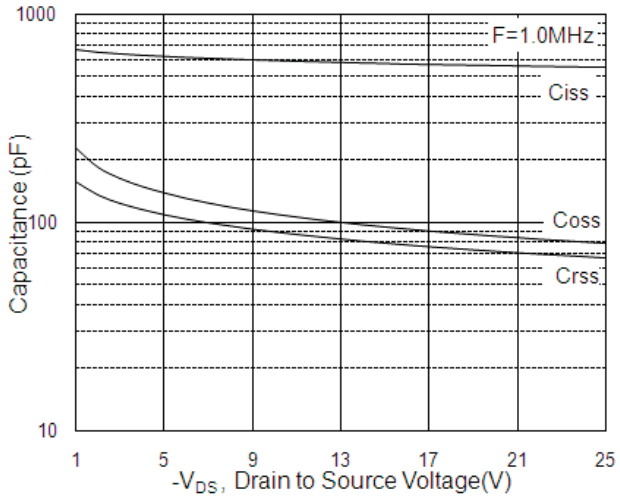


Fig.7 Capacitance

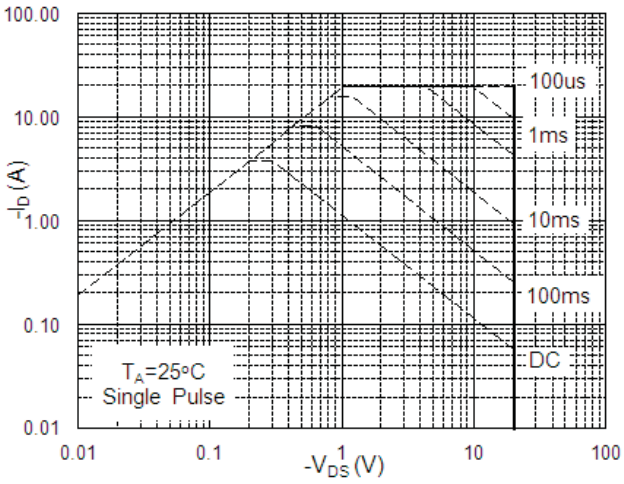


Fig.8 Safe Operating Area

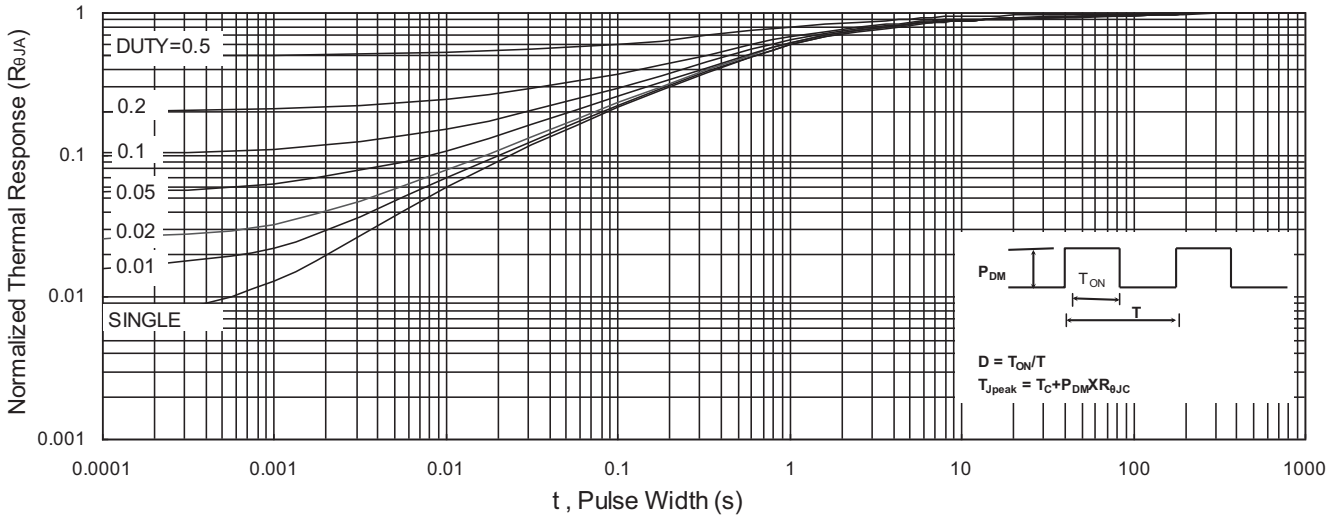


Fig.9 Normalized Maximum Transient Thermal Impedance

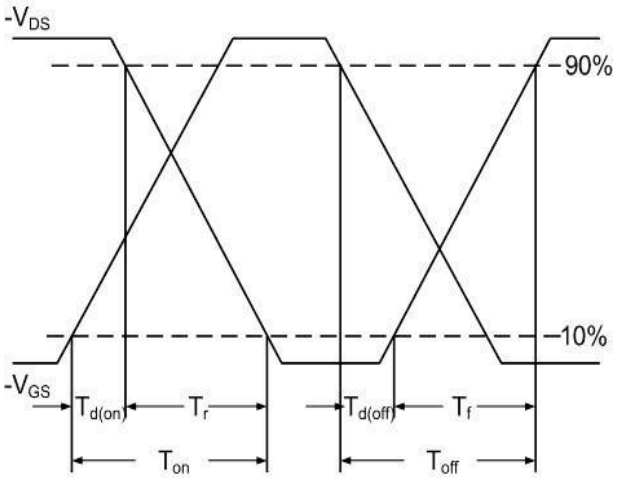


Fig.10 Switching Time Waveform

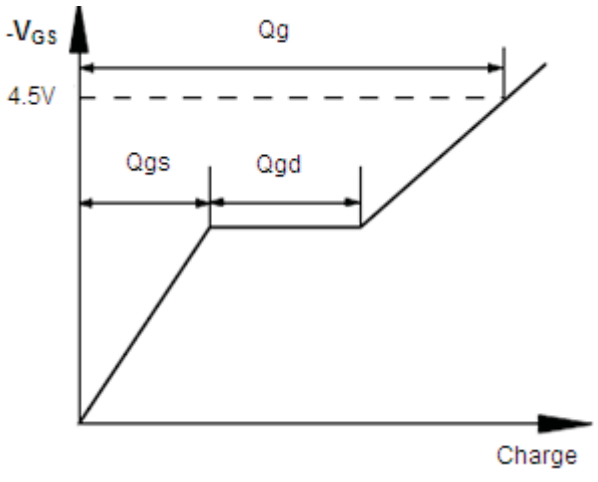
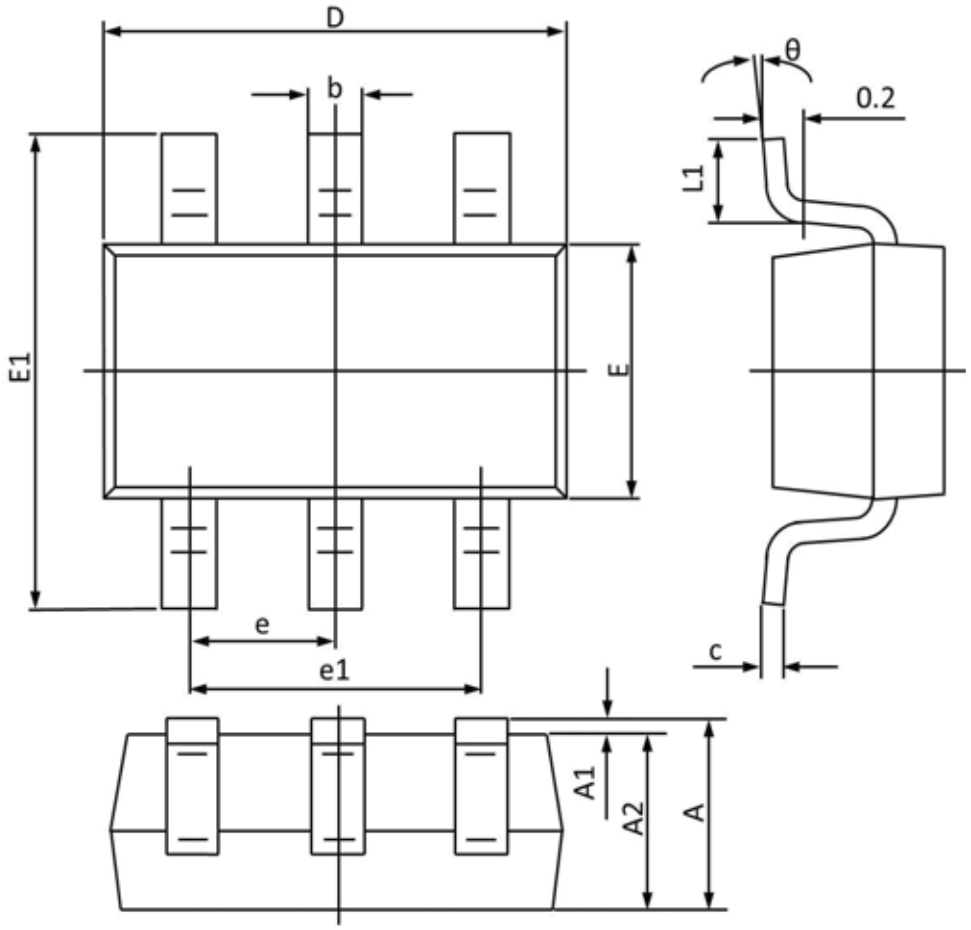


Fig.11 Gate Charge Waveform

SOT23-6 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.450	-	0.057	-
A1	0.100	0.000	0.004	0.000
A2	1.300	1.050	0.051	0.041
b	0.500	0.300	0.020	0.012
c	0.200	0.100	0.008	0.004
D	3.100	2.700	0.122	0.106
E	1.800	1.400	0.071	0.055
E1	3.000	2.600	0.118	0.102
e	0.95BSC		0.037BSC	
e1	2.000	1.800	0.079	0.071
L1	0.600	0.300	0.024	0.012
θ	10°	0°	10°	0°

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