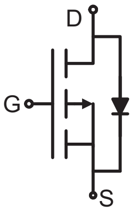
P-Channel Enhancement Mode Power MOSFET

Description

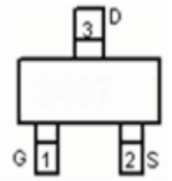
The RM2P60S2 uses advanced trench technology to provide excellent $R_{DS(ON)}$, This device is suitable for use as a load switch or in PWM applications.



Schematic diagram

General Features

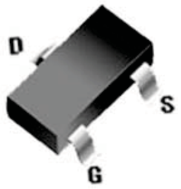
- V_{DS} = -60V,I_D = -1.9A
  $R_{DS(ON)}$ < 260mΩ @ V_{GS}=-4.5V
  $R_{DS(ON)}$ <215mΩ @ V_{GS}=-10V
- High power and current handing capability
- Lead free product is acquired
- Surface mount package



Marking and pin Assignment

Application

- PWM applications
- Load switch
- Power management
- Halogen-free
- P/N suffix V means AEC-Q101 qualified, e.g:RM2P60S2V



SOT-23 top view

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
2309	RM2P60S2	SOT23	Ø180mm	8 mm	3000 units

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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous	T_A=25℃	I_D	-1.9	A
	T_A=70℃	I_D	-1.5	A
Drain Current-Pulsed (Note 1)		I_{DM}	-7.6	A
Maximum Power Dissipation	T_A=25℃	P_D	1.4	W
	T_A=70℃	P_D	0.9	W
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{θJA}$	90	℃/W

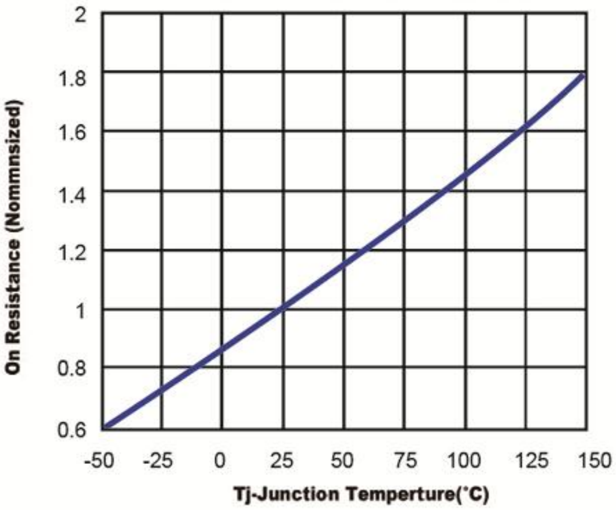
Electrical Characteristics (T_A=25℃unless otherwise noted)

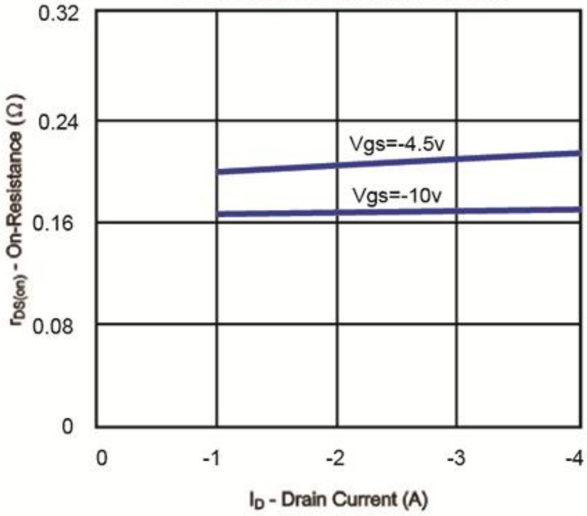
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250μA	-60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-24V,V_{GS}=0V	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250A	-1	-	-3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-1.8A	-	170	215	mΩ
		V_{GS}=-4.5V, I_D=-1.4A	-	200	260	mΩ
Dynamic Characteristics (Note4)						
Input Capacitance	C_{Iss}	V_{DS}=-30V,V_{GS}=0V, F=1.0MHz	-	358	-	pF
Output Capacitance	C_{oss}		-	23	-	pF
Reverse Transfer Capacitance	C_{rss}		-	17	-	pF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=-30V,R_L=30Ω V_{GS}=-10V,R_{GEN}=3.3Ω I_D=-1A	-	20	-	ns
Turn-on Rise Time	t_r		-	33.1	-	ns
Turn-Off Delay Time	$t_{d(off)}$		-	5.2	-	ns
Turn-Off Fall Time	t_f		-	3.8	-	ns
Total Gate Charge	Q_g	V_{DS}=-48V,I_D=-1A,V_{GS}=-4.5V	-	6.3	-	nC
Gate-Source Charge	Q_{gs}		-	2.3	-	nC
Gate-Drain Charge	Q_{gd}		-	1.8	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=-1.2A	-	-	-1.2	V

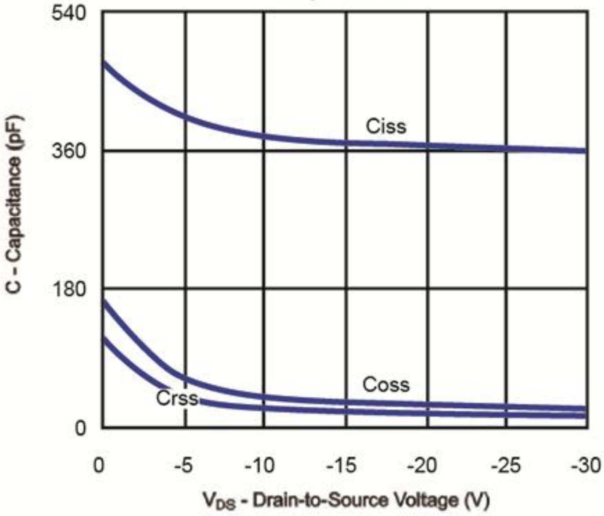
Notes:

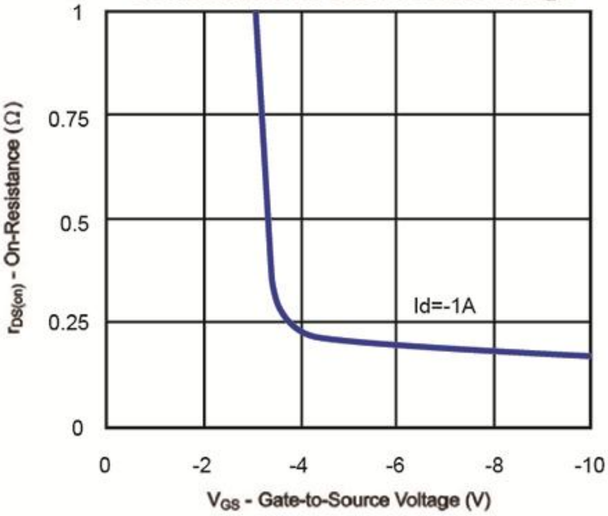
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

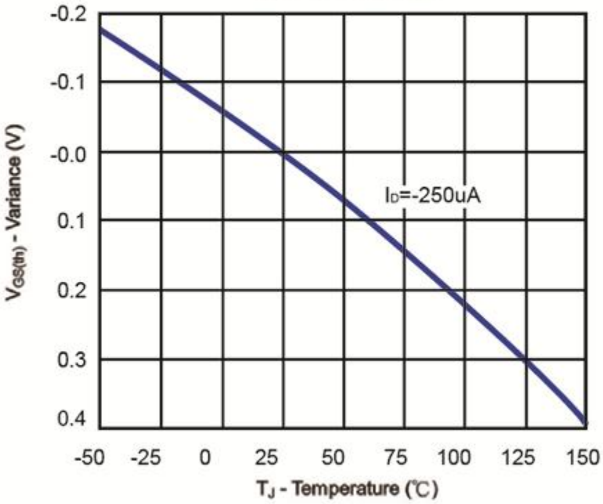
RATING AND CHARACTERISTICS CURVES (RM2P60S2)

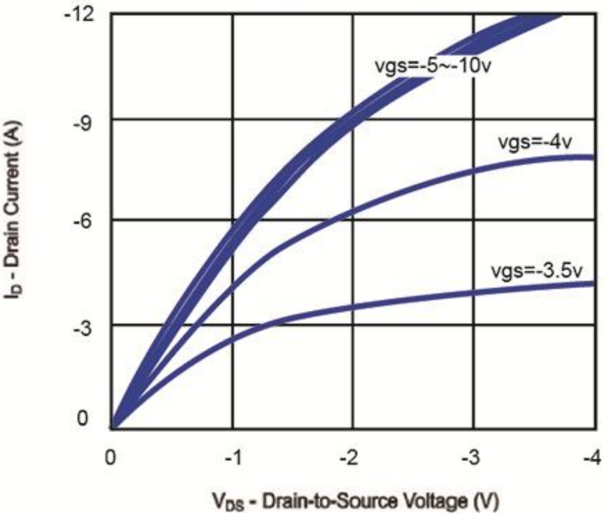

On Resistance vs. Junction Temperture


On-Resistance vs. Drain Current


Capacitance

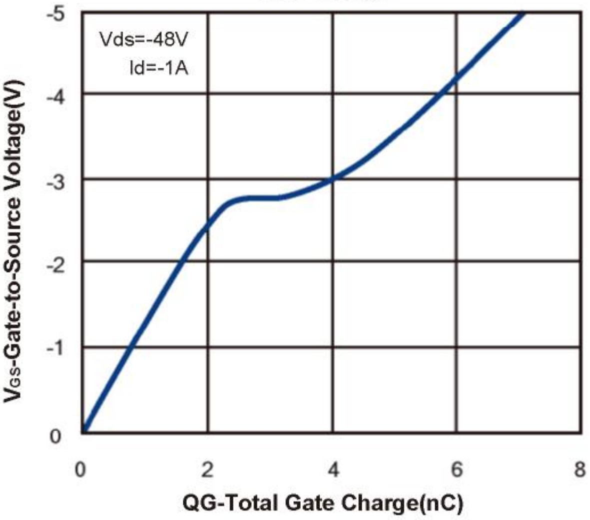

On-Resistance vs. Gate-to-Source Voltage


Threshold Voltage

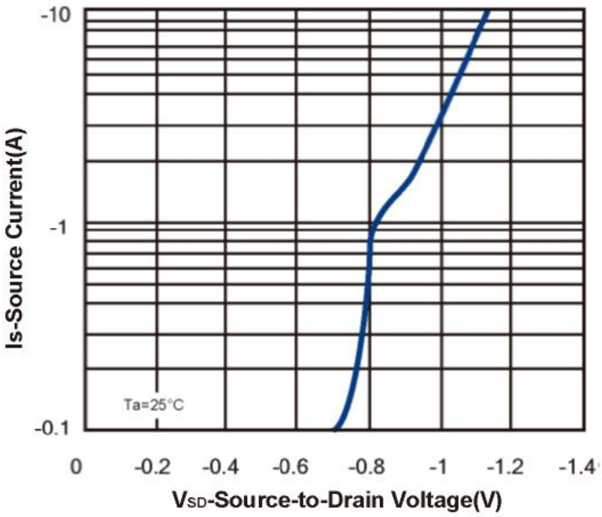

On-Region Characteristics

RATING AND CHARACTERISTICS CURVES (RM2P60S2)

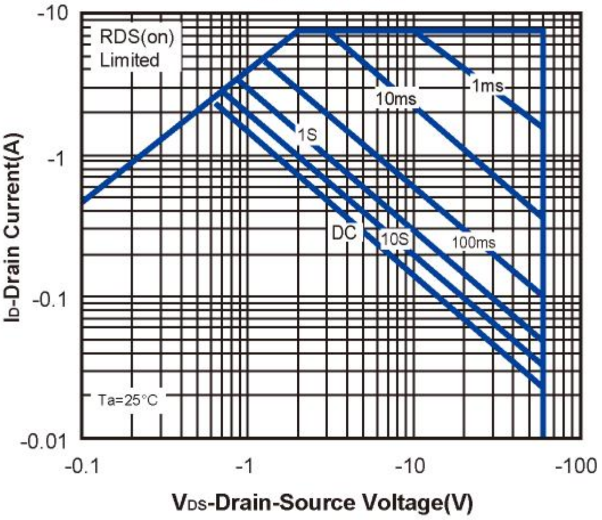
Gate Charge



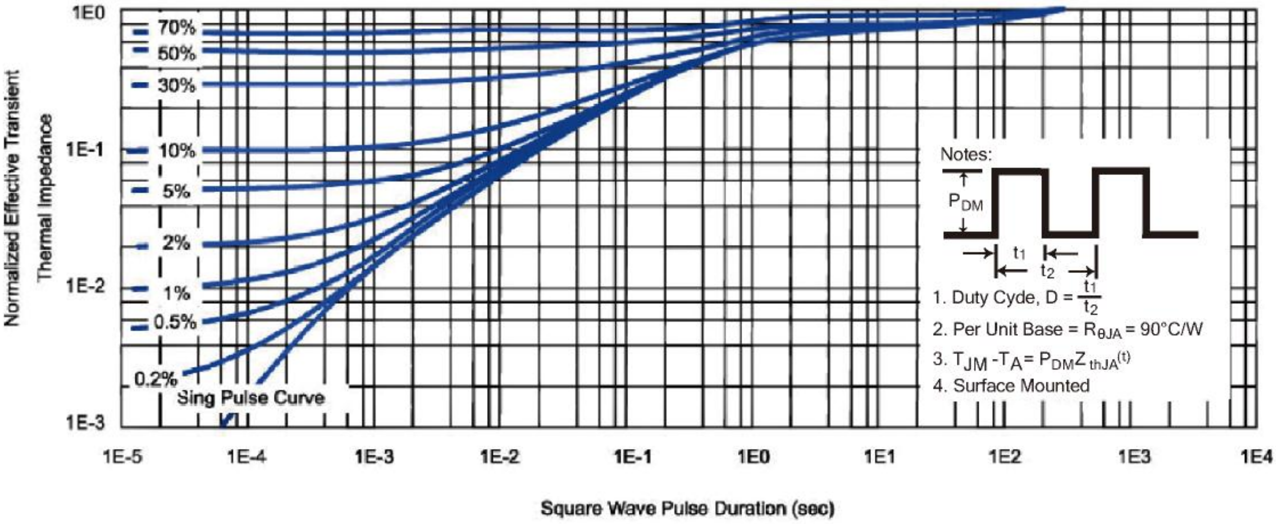
Body-diode characteristics



Maximum Forward Biased Safe Operating Area



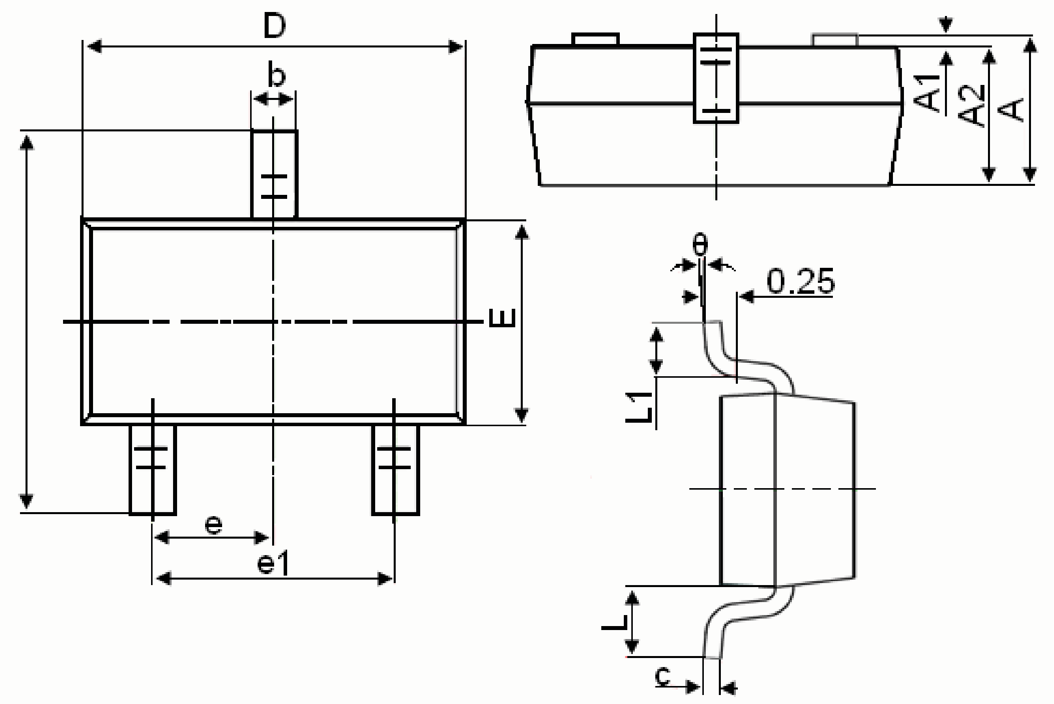
Normalized Thermal Transient Impedance, Junction-to-Ambient



Notes:

1. Duty Cyde, D = $\frac{t_1}{t_2}$
2. Per Unit Base = $R_{\theta JA}$ = 90°C/W
3. $T_{JM} - T_A = P_{DM} Z_{thJA}(t)$
4. Surface Mounted

SOT-23 Package Information



Symbol	Dimensions in Millimeters	
	MIN.	**MAX.**
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

Notes

1. All dimensions are in millimeters.
2. Tolerance ±0.10mm (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

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