

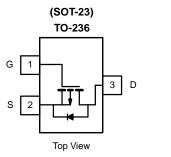
RoHS COMPLIANT HALOGEN

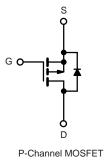
FREE

AFP2337AS23RG-VB Datasheet

P-Channel 30 V (D-S) MOSFET

PRODUC	CT SUMMARY		
V _{DS} (V)	R _{DS(on)} (Ω) Typ.	I _D (A) ^a	Q _g (Typ.)
	0.046 at V _{GS} = - 10 V	- 5.6	
- 30	0.049 at V _{GS} = - 6 V	- 5	11.4 nC
	0.054 at V _{GS} = - 4.5 V	-4.5	





FEATURES

- Trench Power MOSFET
- 100 % R_g Tested



- For Mobile Computing
 - Load Switch
 - Notebook Adaptor Switch
 - DC/DC Converter

Parameter		Symbol	Limit	Unit	
Drain-Source Voltage		V _{DS}	- 30	V	
Gate-Source Voltage		V _{GS}	± 20	v	
Continuous Drain Current (T _J = 150 °C)	T _C = 25 °C		- 5.6		
	T _C = 70 °C		- 5.1		
	T _A = 25 °C	I _D	- 5.4 ^{b,c}		
	T _A = 70 °C		- 4.3 ^{b,c}	А	
Pulsed Drain Current (t = 100 µs)		I _{DM}	- 18		
Continuus Courses Drain Diada Current	T _C = 25 °C		- 2.1		
Continous Source-Drain Diode Current	T _A = 25 °C	I _S	- 1 ^{b,c}		
	T _C = 25 °C		2.5		
	T _C = 70 °C		1.6	14/	
Maximum Power Dissipation	T _A = 25 °C	P _D	1.25 ^{b,c}	W	
	T _A = 70 °C		0.8 ^{b,c}		
Operating Junction and Storage Temperatur	e Range	T _J , T _{stg}	- 55 to 150	°C	

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{b,d}	$t \le 5 s$	R _{thJA}	75	100	°C/W
Maximum Junction-to-Foot (Drain)	Steady State	R _{thJF}	40	50	0/11

Notes:

a. Based on T_C = 25 °C.
b. Surface mounted on 1" x 1" FR4 board.

c. t = 5 s.

d. Maximum under steady state conditions is 166 °C/W.

SPECIFICATIONS (T _J = 25 °C	unless othe	rwise noted)				
Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit
Static	•					
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 V, I_D = -250 \mu A$	- 30			V
V _{DS} Temperature Coefficient	$\Delta V_{DS}/T_{J}$	I _D = - 250 μA		- 19		mV/°C
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	10 = 200 μΑ		4		IIIV/ C
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}$, $I_D = -250 \ \mu A$	- 0.5		- 2.0	V
Gate-Source Leakage	I _{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA
Zara Cata Valtaga Drain Current	I _{DSS}	$V_{DS} = -30 \text{ V}, \text{ V}_{GS} = 0 \text{ V}$			- 1	μA
Zero Gate Voltage Drain Current		$V_{DS} = -30 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 55 \text{ °C}$			- 5	
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \le$ - 5 V, V_{GS} = - 10 V	- 2.5			A
		V _{GS} =- 10 V, I _D = - 4.4 A		0.046		
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} =- 6 V, I _D = - 4 A		0.049		Ω
		$V_{GS} = -4.5 \text{ V}, \text{ I}_{D} = -3.6 \text{ A}$		0.054		
Forward Transconductance ^a	9 _{fs}	V _{DS} = - 15 V, I _D = - 3.4 A		18		S
Dynamic ^b				-		
Input Capacitance	C _{iss}			1295		
Output Capacitance	C _{oss}	V _{DS} = - 15 V, V _{GS} = 0 V, f = 1 MHz		150		pF
Reverse Transfer Capacitance	C _{rss}			130		
Total Gate Charge	0	V_{DS} = - 15 V, V_{GS} = - 10 V, I_D = - 5.4 A		24	36	
Total Gate Charge	Q _g			11.4	17	nC
Gate-Source Charge	Q _{gs}	V_{DS} = - 15 V, V_{GS} = - 4.5 V, I_D = - 5.4 A		3.4		
Gate-Drain Charge	Q _{gd}			3.8		
Gate Resistance	R _g	f = 1 MHz	1.5	7.7	15.4	Ω
Turn-On Delay Time	t _{d(on)}			13	20	
Rise Time	t _r	V_{DD} = - 15 V, R_L = 3.5 Ω		4	8	
Turn-Off Delay Time	t _{d(off)}	$\text{I}_\text{D}\cong$ - 4.3 A, V_GEN = - 10 V, R_g = 1 Ω		38	57	
Fall Time	t _f			6	12	
Turn-On Delay Time	t _{d(on)}			28	42	ns
Rise Time	t _r	V_{DD} = - 15 V, R_L = 3.5 Ω		16	24	
Turn-Off Delay Time	t _{d(off)}	$I_D \cong$ - 4.3 A, V_{GEN} = - 4.5 V, R_g = 1 Ω		30	45	
Fall Time	t _f			10	20	
Drain-Source Body Diode Characteristi	cs	· · · · ·		•		
Continuous Source-Drain Diode Current	۱ _S	T _C = 25 °C			- 2.1	A
Pulse Diode Forward Current (t = $100 \ \mu s$)	I _{SM}				- 80	
Body Diode Voltage	V _{SD}	$I_{S} = -4.3 \text{ A}, V_{GS} = 0 \text{ V}$		- 0.8	- 1.2	V
Body Diode Reverse Recovery Time	t _{rr}			15	23	ns
Body Diode Reverse Recovery Charge	Q _{rr}	I _F = - 4.3 A, dl/dt = 100 A/μs, T _J = 25 °C		7	14	nC
Reverse Recovery Fall Time	t _a	$F_{\rm F} = 4.077, {\rm di/dt} = 1007/\mu {\rm s}, {\rm f}_{\rm J} = 2000$		8		ns
Reverse Recovery Rise Time	t _b			7		

Notes:

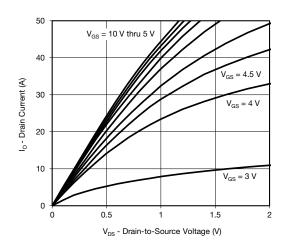
a. Pulse test; pulse width \leq 300 µs, duty cycle \leq 2 %.

b. Guaranteed by design, not subject to production testing.

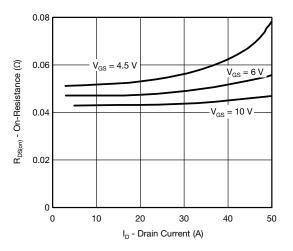
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.







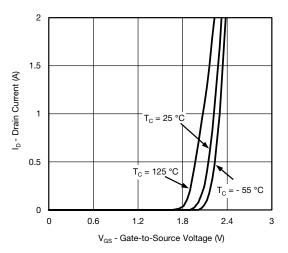
Output Characteristics



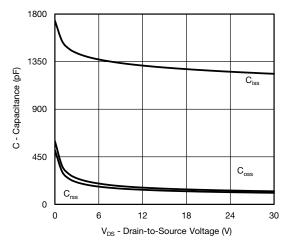
On-Resistance vs. Drain Current



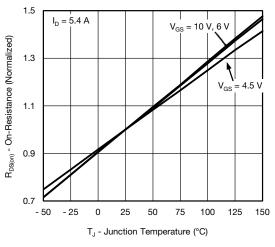
Gate Charge



Transfer Characteristics

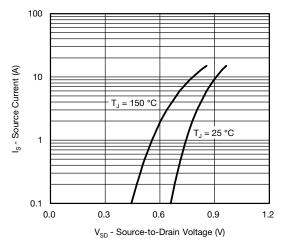


Capacitance



On-Resistance vs. Junction Temperature

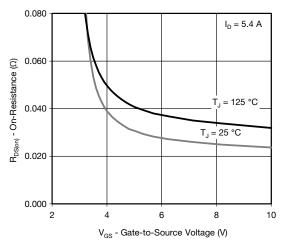




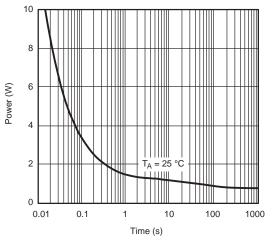
Source-Drain Diode Forward Voltage







On-Resistance vs. Gate-to-Source Voltage

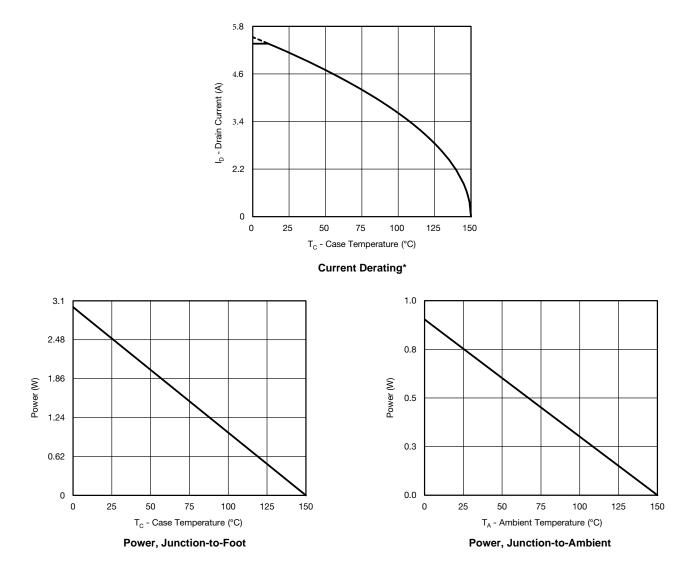


Single Pulse Power (Junction-to-Ambient)



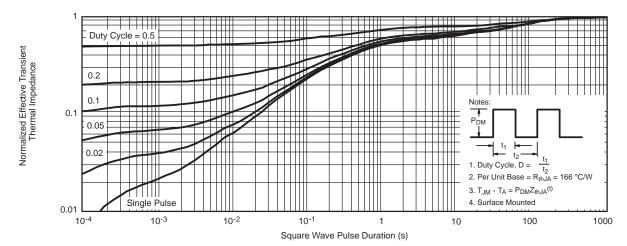
Safe Operating Area, Junction-to-Ambient





* The power dissipation P_D is based on $T_{J(max.)} = 150$ °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.





Normalized Thermal Transient Impedance, Junction-to-Ambient



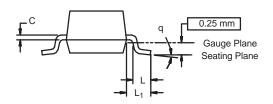
Normalized Thermal Transient Impedance, Junction-to-Foot



SOT-23 (TO-236): 3-LEAD







Max 1.12 0.10 1.02 0.50 0.18 3.04 2.64 1.40	Min 0.035 0.0004 0.0346 0.014 0.003 0.110 0.083	Max 0.044 0.004 0.040 0.020 0.007 0.120 0.104		
0.10 1.02 0.50 0.18 3.04 2.64	0.0004 0.0346 0.014 0.003 0.110 0.083	0.004 0.040 0.020 0.007 0.120		
1.02 0.50 0.18 3.04 2.64	0.0346 0.014 0.003 0.110 0.083	0.040 0.020 0.007 0.120		
0.50 0.18 3.04 2.64	0.014 0.003 0.110 0.083	0.020 0.007 0.120		
0.18 3.04 2.64	0.003 0.110 0.083	0.007 0.120		
3.04 2.64	0.110 0.083	0.120		
2.64	0.083			
		0.104		
1.40	0.047			
	0.047	0.055		
0.95 BSC	0.037	4 Ref		
1.90 BSC		0.0748 Ref		
0.60	0.016	0.024		
0.64 Ref	0.025	5 Ref		
0.50 Ref	0.020 Ref			
8°	3°	8°		
_	0.64 Ref 0.50 Ref	0.64 Ref 0.025 0.50 Ref 0.026		

AFP2337AS23RG-VB



RECOMMENDED MINIMUM PADS FOR SOT-23



Recommended Minimum Pads Dimensions in Inches/(mm)



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