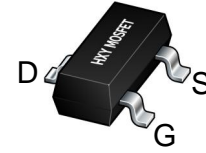




Description

The ZVN4106F uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



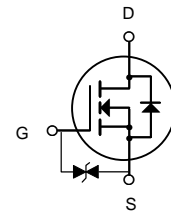
SOT-23

General Features

$V_{DS} = 60V$ $I_D = 0.3A$

$R_{DS(ON)} < 2\Omega$ @ $V_{GS} = 10V$

ESD Rating: HBM $\geq 2000V$



N-Channel MOSFET

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
ZVN4106F	SOT-23	HXY MOSFET	3000

Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Limit	Unit	
V_{DS}	Drain-Source Voltage	60	V	
V_{GS}	Gate-Source Voltage	± 20	V	
I_D	Continuous Drain Current ($T_J = 150^\circ C$)	$T_A = 25^\circ C$	0.3	A
		$T_A = 100^\circ C$	0.19	
I_{DM}	Drain Current-Pulsed (Note 1)	0.8	A	
P_D	Maximum Power Dissipation	0.35	W	
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ C$	
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 2)	350	$^\circ C/W$	



Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	60	68	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±10V, V _{DS} =0V	-	±100	±500	nA
		V _{GS} =±20V, V _{DS} =0V	-	±4	±10	uA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.7	1.2	1.9	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =5V, I _D =0.1A	-	1.3	3	Ω
		V _{GS} =10V, I _D =0.1A	-	1	2	Ω
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =0.2A	0.1	-	-	S
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, F=1.0MHz	-	21	50	PF
Output Capacitance	C _{oss}		-	11	25	PF
Reverse Transfer Capacitance	C _{rss}		-	4.2	5	PF
Turn-on Delay Time	t _{d(on)}	V _{DD} =30V, I _D =0.2A V _{GS} =10V, R _{GEN} =10Ω	-	10	-	nS
Turn-on Rise Time	t _r		-	50	-	nS
Turn-Off Delay Time	t _{d(off)}		-	17	-	nS
Turn-Off Fall Time	t _f		-	10	-	nS
Total Gate Charge	Q _g	V _{DS} =10V, I _D =0.3A, V _{GS} =4.5V	-	1.7	3	nC
Diode Forward Voltage ^(Note 3)	V _{SD}	V _{GS} =0V, I _S =0.2A	-	-	1.2	V
Diode Forward Current ^(Note 2)	I _S		-	-	0.3	A

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



Typical Electrical And Thermal Characteristics



Figure 1: Switching Test Circuit

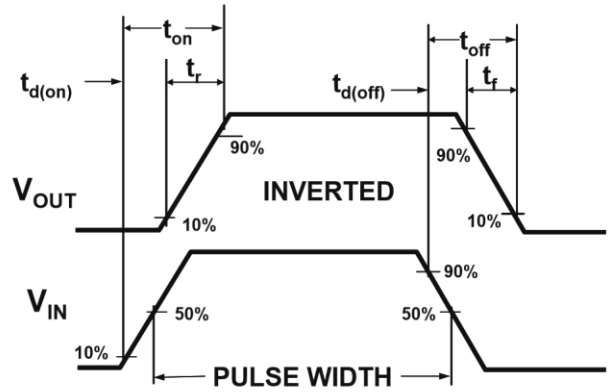


Figure 2: Switching Waveforms

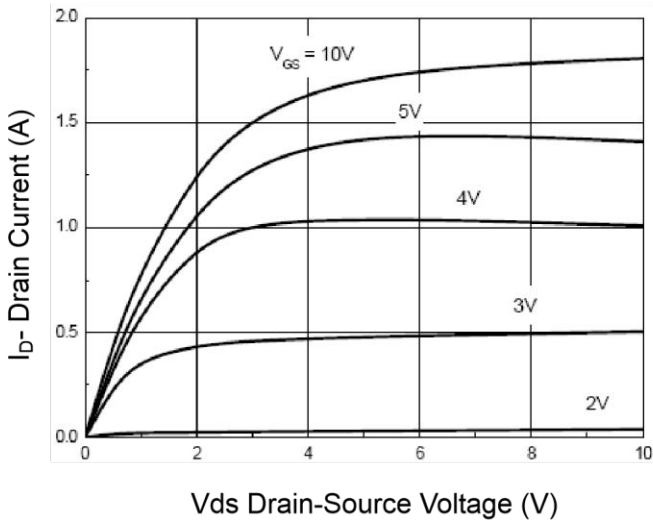


Figure 3 Output Characteristics

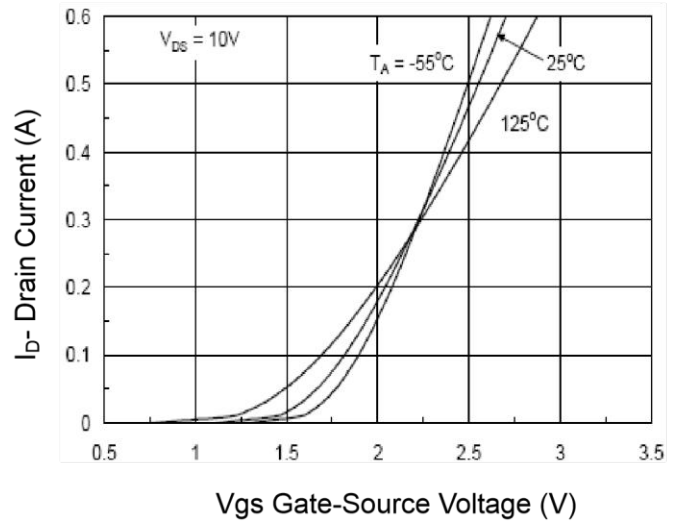


Figure 4 Transfer Characteristics

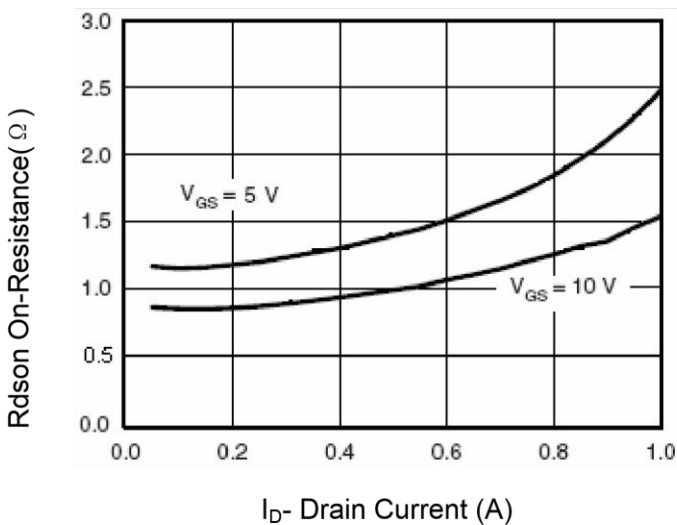


Figure 5 Drain-Source On-Resistance

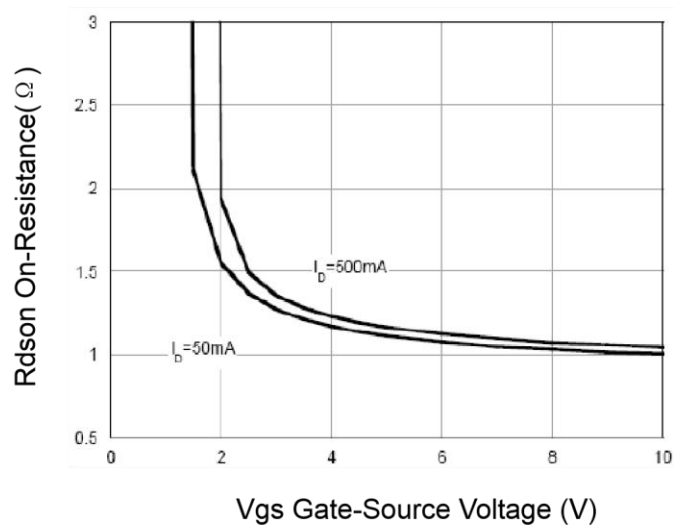


Figure 6 R_DS(on) vs V_GS

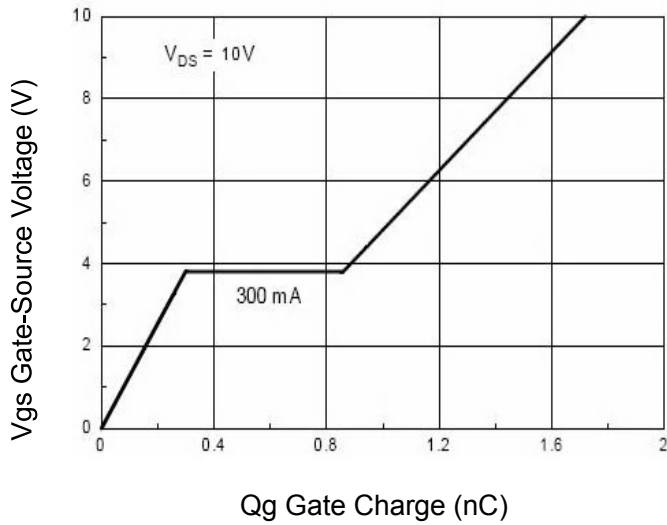


Figure 7 Gate Charge

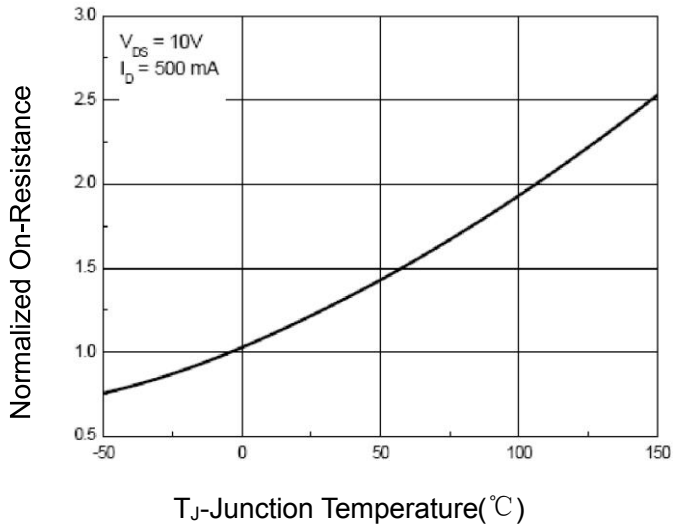


Figure 9 Drain-Source On-Resistance

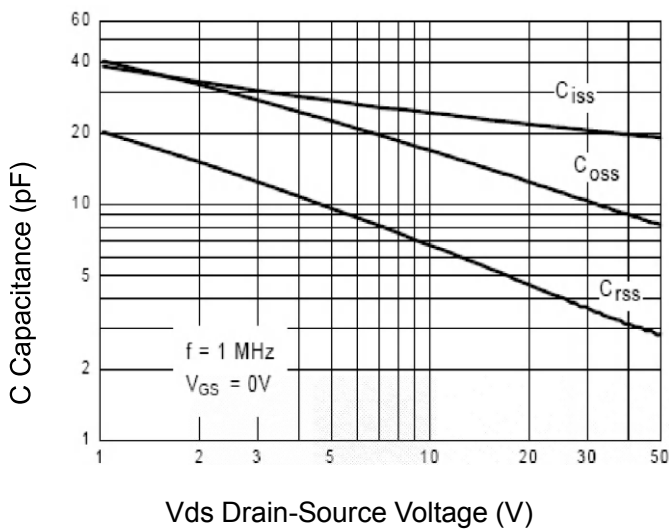


Figure 11 Capacitance vs Vds

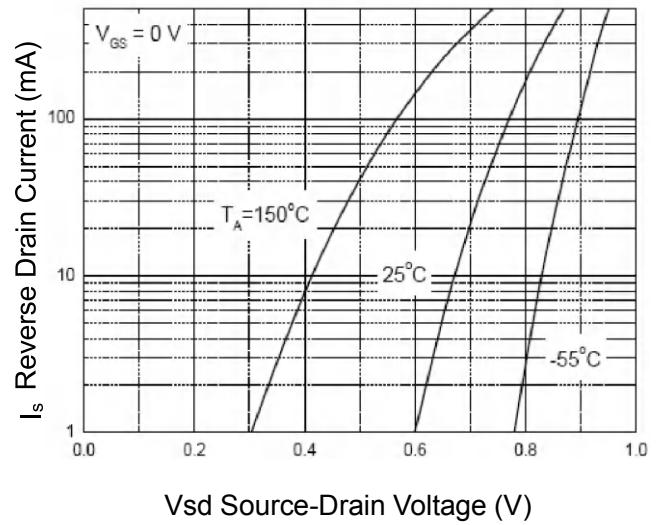


Figure 8 Source-Drain Diode Forward

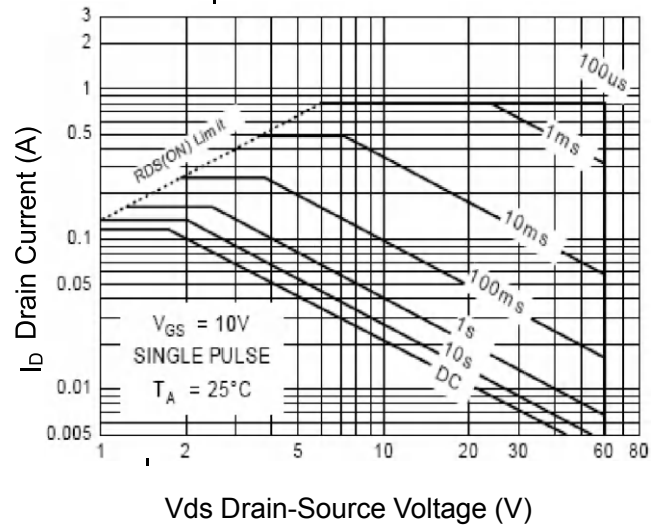


Figure 10 Safe Operation Area

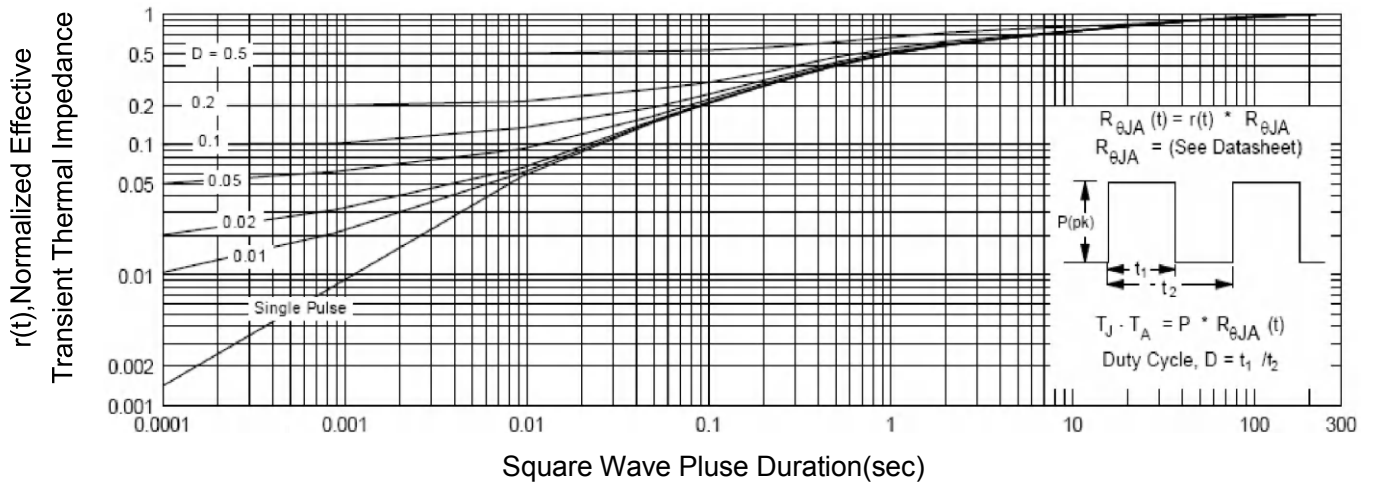
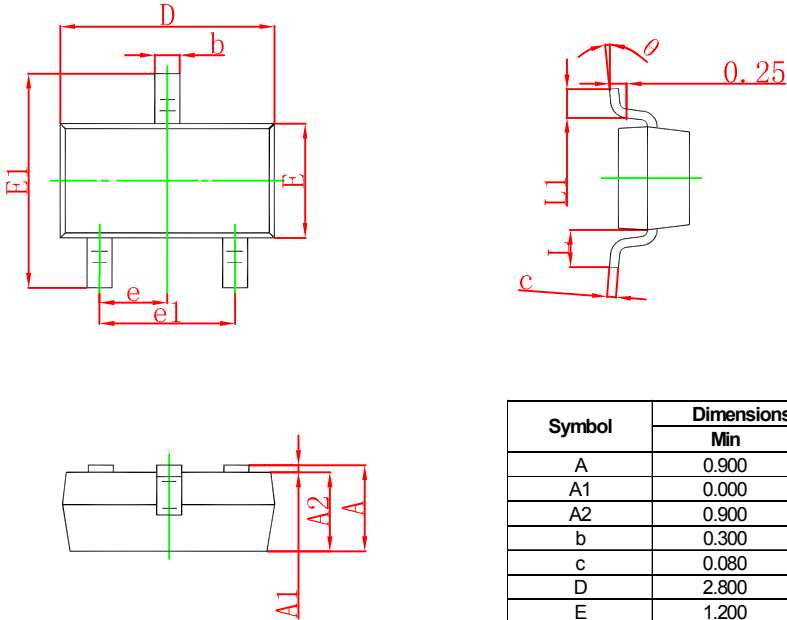


Figure 12 Normalized Maximum Transient Thermal Impedance

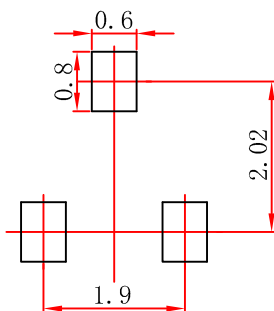


SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: $\pm 0.05\text{mm}$.
 3. The pad layout is for reference purposes only.



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