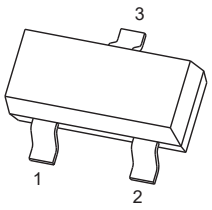
GP2310

60V N-Channel MOSFET

Product Summary

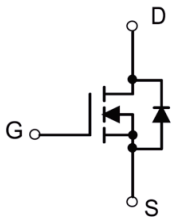
$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	70mΩ@10V	3A
	82mΩ@4.5V	

SOT-23



1. GATE
2. SOURCE
3. DRAIN

Schematic diagram



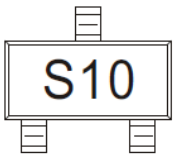
Feature

- High power and current handing capability
- Surface mount package

Application

- Battery Switch
- DC/DC Converter

MARKING:



ABSOLUTE MAXIMUM RATINGS (T_A=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	
Continuous Drain Current	I_D	3	A
Pulsed Drain Current[1]	I_{DM}	10	
Maximum Power Dissipation	P_D	1.3	W
Thermal Resistance from Junction to Ambient[2]	$R_{\theta JA}$	96	℃/W
Thermal Resistance from Junction to Board	$R_{\theta JB}$	22	℃/W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	8	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	

MOSFET ELECTRICAL CHARACTERISTICS (T_A = 25℃ unless otherwise noted)

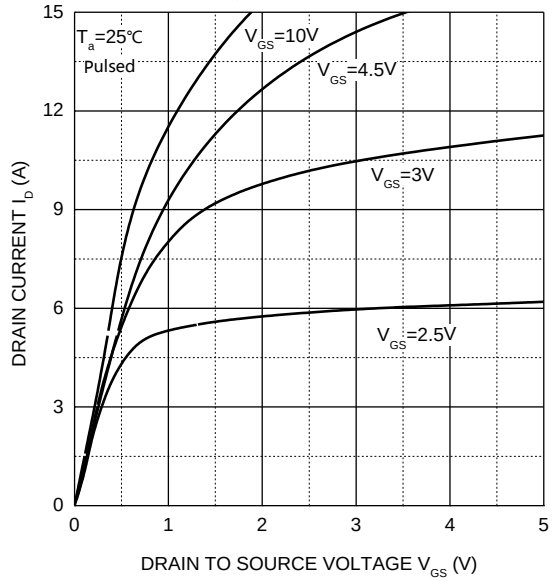
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60V, V_{GS} = 0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
On Characteristics[3]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.5	1.2	2	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 3A		70	90	mΩ
		V_{GS} = 4.5V, I_D = 3A		82	125	
Forward Tranconductance	g_{FS}	V_{DS} = 15V, I_D = 2A	1.4	2.5		S
Dynamic Characteristics[4]						
Input Capacitance	C_{iss}	V_{DS} = 30V, V_{GS} = 0V, f = 1MHz		250		pF
Output Capacitance	C_{oss}			26		
Reverse Transfer Capacitance	C_{rss}			20		
Gate Resistance	R_g	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz		2.3	3.5	Ω
Switching Characteristics[4]						
Total Gate Charge	Q_g	V_{DS} = 30V, V_{GS} = 4.5V, I_D = 3A		7		nC
Gate-Source Charge	Q_{gs}			1.2		
Gate-Drain Charge	Q_{gd}			1.5		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 30V, V_{GS} = 10V, I_D = 1.5A, R_G = 1Ω		6.5		ns
Turn-On Rise Time	t_r			15.2		
Turn-Off Delay Time	$t_{d(off)}$			15.2		
Turn-Off Fall Time	t_f			10.3		
Source-Drain Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, I_S = 3A		0.8	1.2	V

Notes :

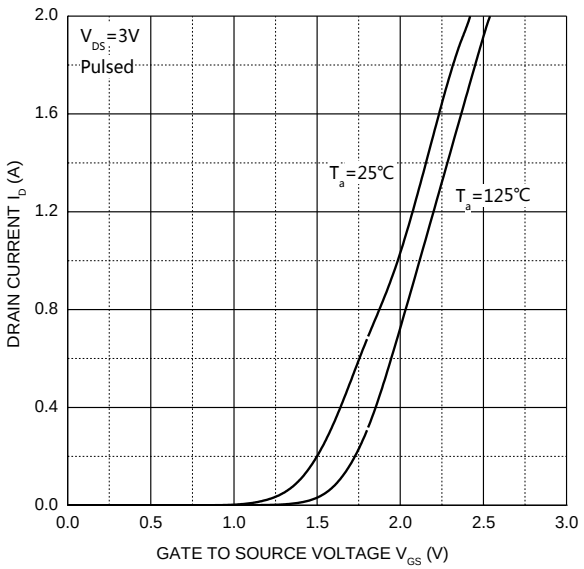
1. Repetitive rating : Pulse width limited by junction temperature.
2. Surface mounted on FR4 board , t≤10s.
3. Pulse Test : Pulse Width≤300μs, Duty Cycle≤0.5%.
4. Guaranteed by design, not subject to producting.

Typical Characteristics

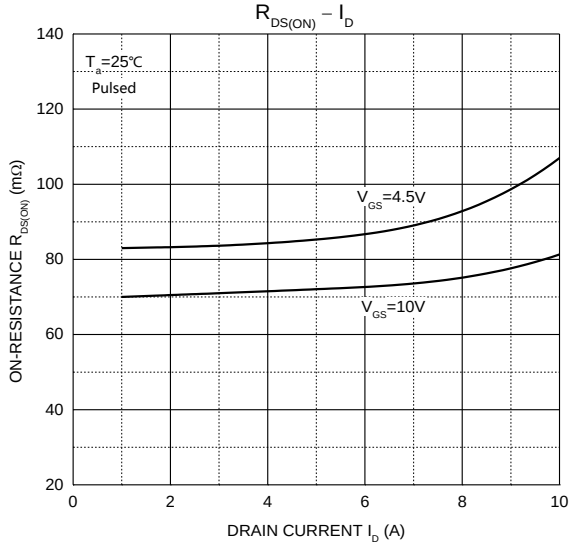
Output Characteristics



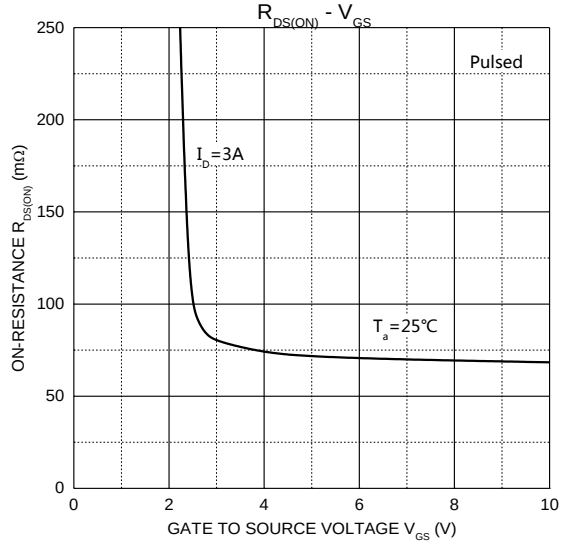
Transfer Characteristics



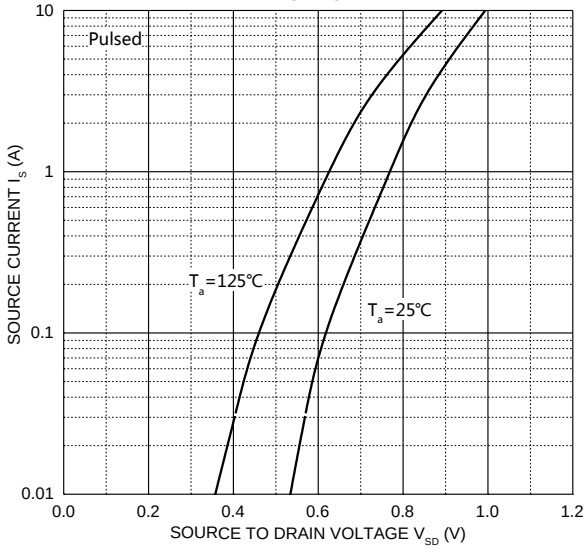
$R_{DS(ON)}$ – I_D



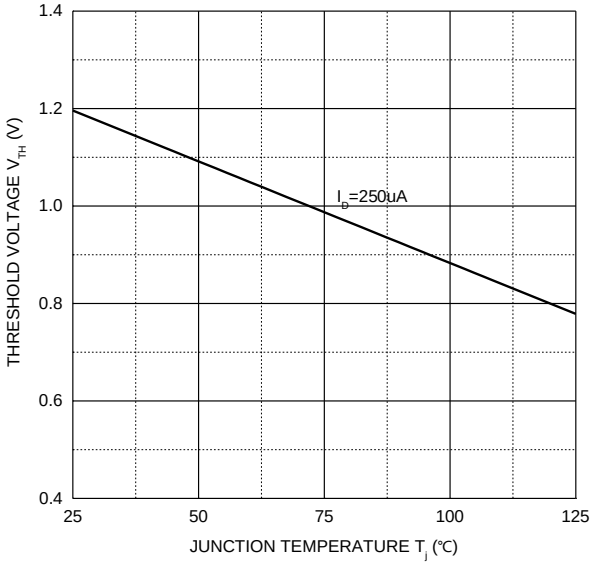
$R_{DS(ON)}$ - V_{GS}

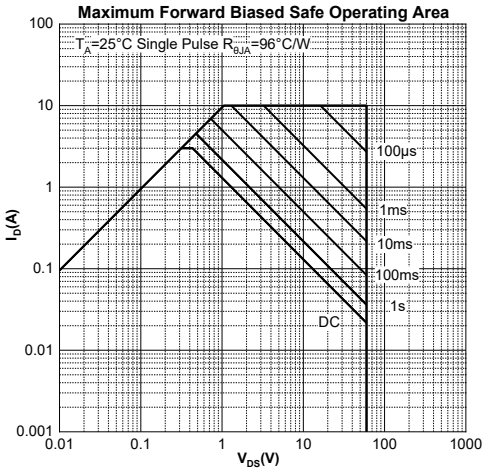


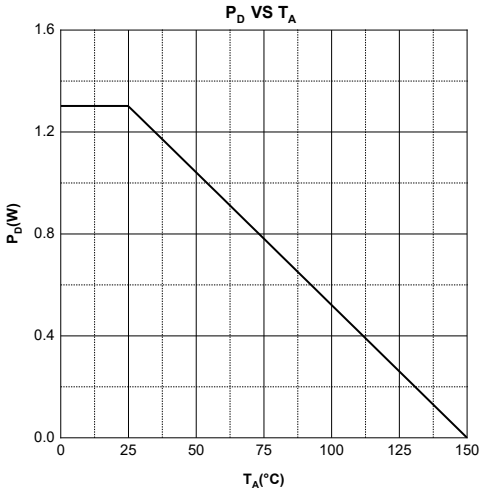
I_S - V_{SD}

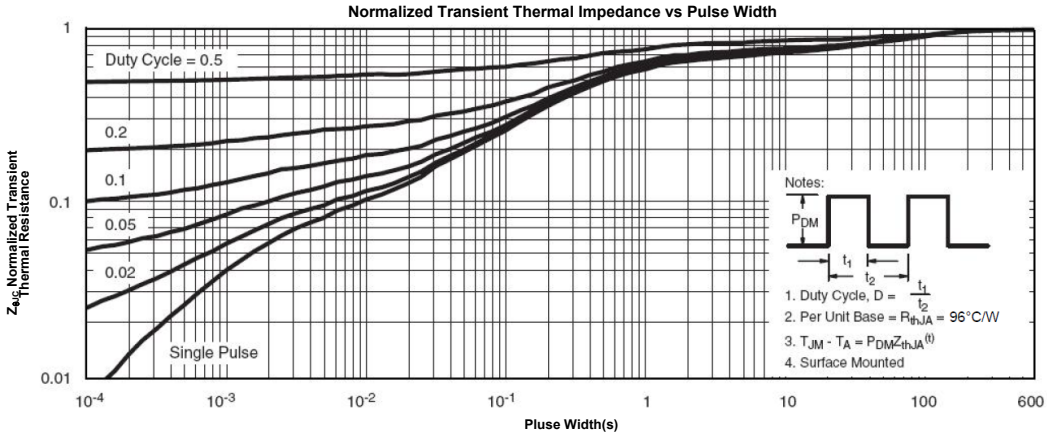


Threshold Voltage

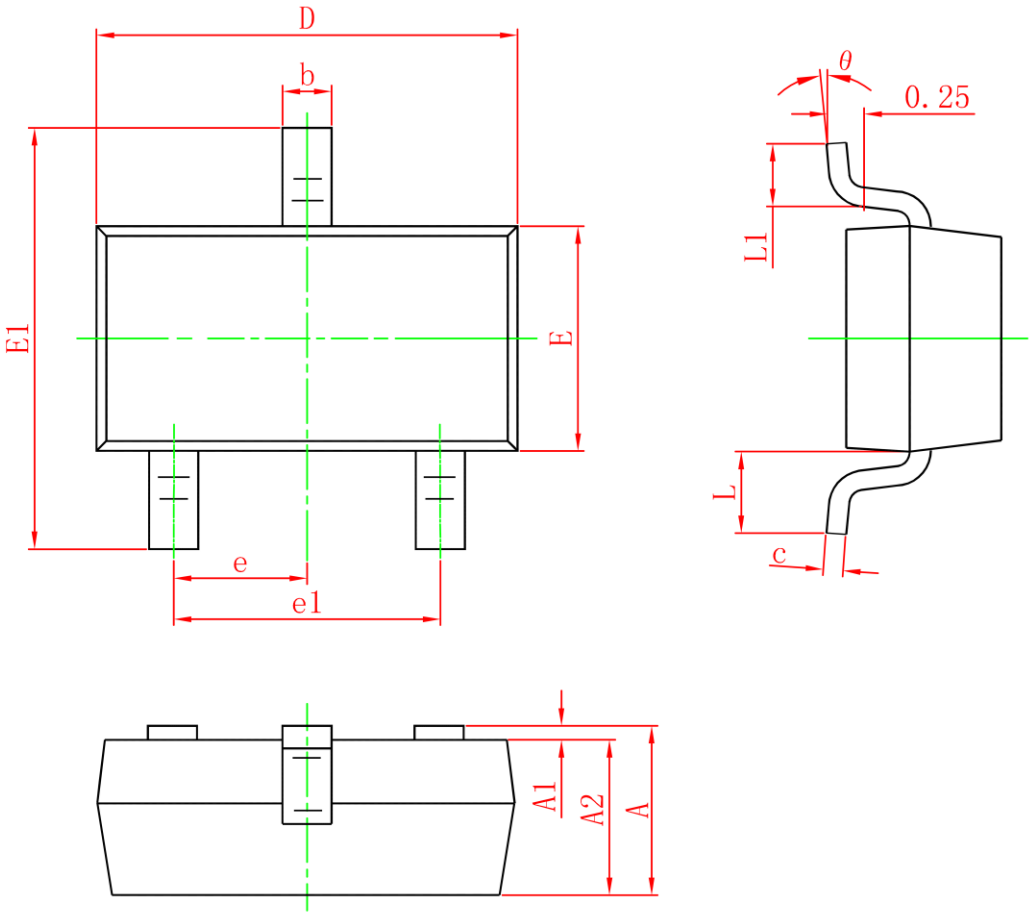



Maximum Forward Biased Safe Operating Area
T_A=25°C Single Pulse $R_{\theta JA}$=96°C/W
100µs
1ms
10ms
100ms
1s
DC
I_D(A)
V_{DS}(V)
100
10
1
0.1
0.01
0.001
0.01
0.1
1
10
100
1000


P_D VS T_A
P_D(W)
T_A(°C)
1.6
1.2
0.8
0.4
0.0
0
25
50
75
100
125
150


Normalized Transient Thermal Impedance vs Pulse Width
Duty Cycle = 0.5
0.2
0.1
0.05
0.02
Single Pulse
$Z_{\theta JC}$ Normalized Transient Thermal Resistance
Pluse Width(s)
Notes:
P_{DM}
t_1
t_2
1. Duty Cycle, D = t_1/t_2
2. Per Unit Base = R_{thJA} = 96°C/W
3. T_{JM} - T_A = $P_{DM}Z_{thJA}(t)$
4. Surface Mounted
1
0.1
0.01
10^{-4}
10^{-3}
10^{-2}
10^{-1}
1
10
100
600

SOT-23 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.300	0.035	0.051
A1	0	0.100	0	0.004
A2	0.900	1.200	0.035	0.047
b	0.300	0.550	0.012	0.022
c	0.080	0.158	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.150	1.500	0.045	0.059
E1	2.200	2.700	0.087	0.106
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.550REF		0.022REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

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