单 N 沟道 MOSFET

ELM4N2510FCA-S

■概要

ELM4N2510FCA-S 是 N 沟道低输入电容，低工作电压，低导通电阻的大电流 MOSFET。

■特点

- Vds=20V
- Id=6A (Vgs=4.5V)
- Rds(on) = 26mΩ (Vgs=4.5V)
- Rds(on) = 35mΩ (Vgs=2.5V)
- Rds(on) = 50mΩ (Vgs=1.8V)

■绝对最大额定值

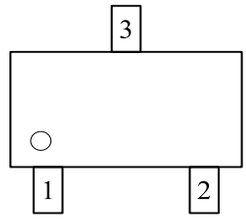
项目		记号	规格范围	单位	备注
漏极 – 源极电压		Vds	20	V	
栅极 – 源极电压		Vgs	± 12	V	
漏极电流（定常）(Vgs=4.5V)	Ta=25℃	Id	6	A	1
	Ta=70℃		5		
漏极电流（脉冲）		Idm	17	A	2
容许功耗	Ta=25℃	Pd	1.00	W	3
	Ta=70℃		0.66		
结合部温度及保存温度范围		Tj, Tstg	– 55 ~ +150	℃	

■热特性

项目	记号	典型值	最大值	单位	备注
结合部 – 环境热阻	Rθja	–	120	℃/W	1

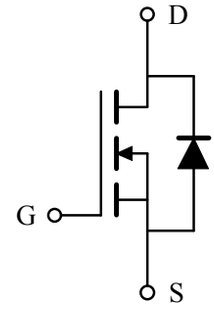
■引脚配置图

SOT-23(俯视图)



引脚编号	引脚名称
1	GATE
2	DRAIN
3	SOURCE

■电路图



■电特性

如没有特别注明时, Tj=25℃

项目	记号	条件	最小值	典型值	最大值	单位	备注
静态特性							
漏极 – 源极击穿电压	BVdss	Id=250μA, Vgs=0V	20	–	–	V	
栅极接地时漏极电流	Idss	Vds=16V,Vgs=0V	–	–	1	μA	
		Vds=16V,Vgs=0V, Tj=55℃	–	–	5		
栅极漏电电流	Igss	Vds=0V, Vgs= ± 12V	–	–	± 100	nA	
栅极阈值电压	Vgs(th)	Vds=Vgs, Id=250μA	0.45	–	1.00	V	
漏极 – 源极导通电阻	Rds(on)	Vgs=4.5V, Id=4A	–	21	26	mΩ	2
		Vgs=2.5V, Id=3A	–	28	35		
		Vgs=1.8V, Id=2A	–	40	50		
正向跨导	Gfs	Vds=5V, Id=4A	–	30	–	S	
二极管正向压降	Vsd	Is=1A, Vgs=0V	–	–	1.2	V	2
寄生二极管最大连续电流	Is	Vgs=Vds=0V, Force current	–	–	6	A	1, 4
动态特性							
输入电容	Ciss	Vgs=0V, Vds=15V, f=1MHz	–	670	–	pF	
输出电容	Coss		–	75	–	pF	
反馈电容	Crss		–	68	–	pF	
开关特性							
总栅极电荷 (4.5)	Qg	Vgs=4.5V, Vds=15V, Id=4A	–	8.60	–	nC	
栅极 – 源极电荷	Qgs		–	1.37	–	nC	
栅极 – 漏极电荷	Qgd		–	2.30	–	nC	
导通延迟时间	td(on)	Vgs=4.5V, Vds=10V , Id=4A Rgen=3.3Ω	–	5.2	–	ns	
导通上升时间	tr		–	34.0	–	ns	
关闭延迟时间	td(off)		–	23.0	–	ns	
关闭下降时间	tf		–	9.2	–	ns	

备注：

1. 安装在70μm厚铜箔的1平方英寸FR-4上时的值；
2. 脉冲测试：脉冲宽度≤300μ秒和占空比≤2%；
3. 功耗受150℃结合部温度限制；
4. 在理论上数据是与Id和Idm相同的，而在实际应用中是受到总功率损耗限制的。

■标准特性和热特性曲线

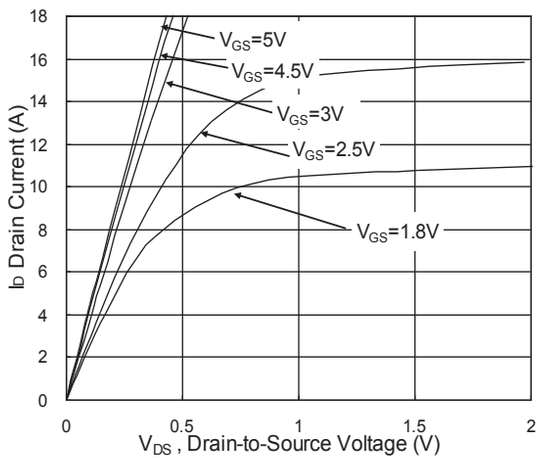


Fig.1 Typical Output Characteristics

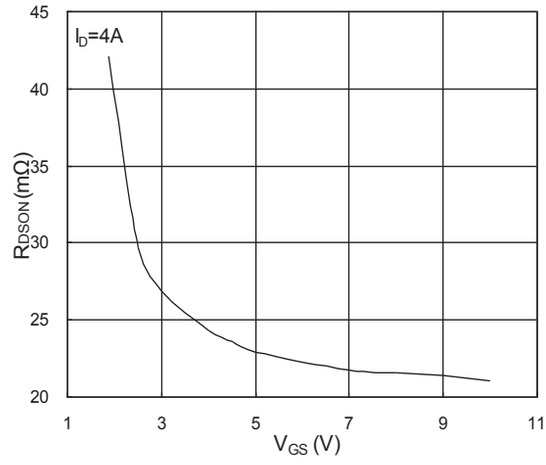


Fig.2 On-Resistance vs. Gate-Source

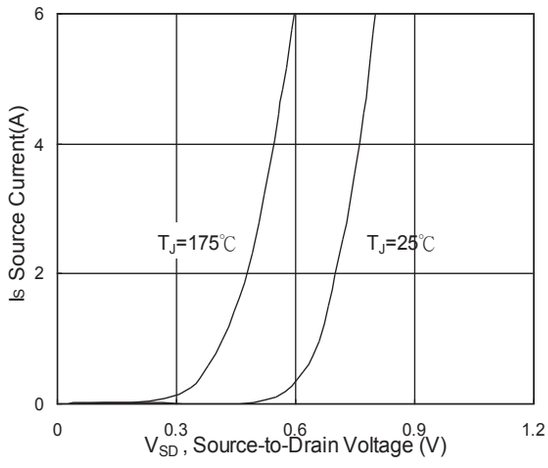


Fig.3 Forward Characteristics Of Reverse

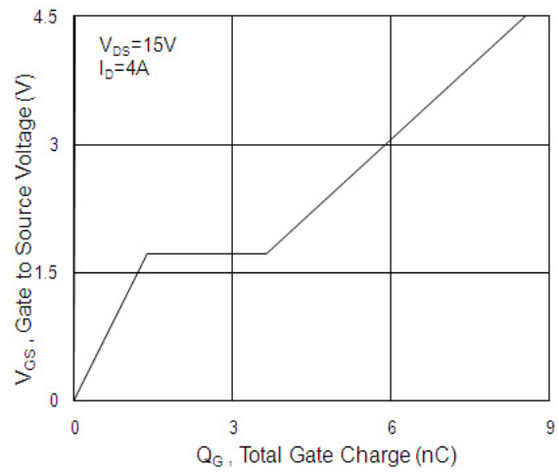


Fig.4 Gate-Charge Characteristics

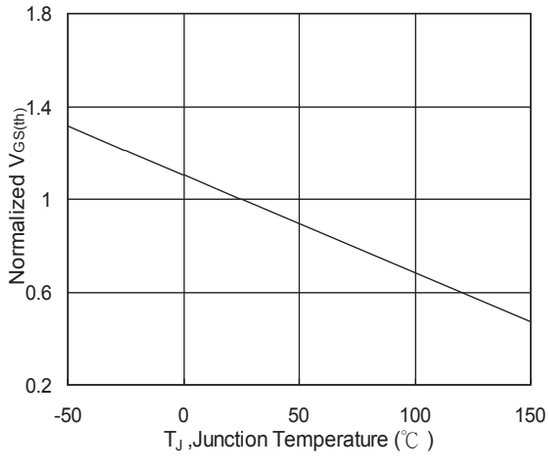


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

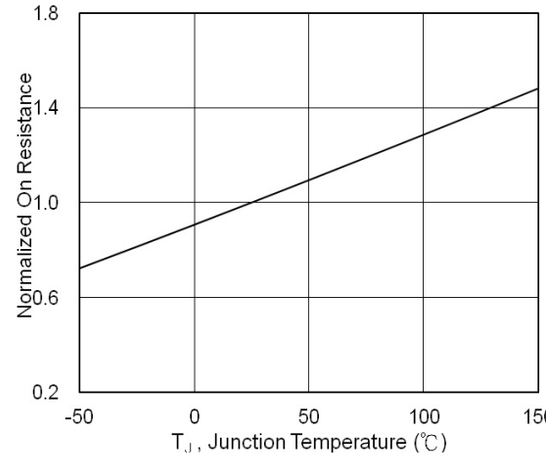


Fig.6 Normalized R_{DSON} vs. T_J

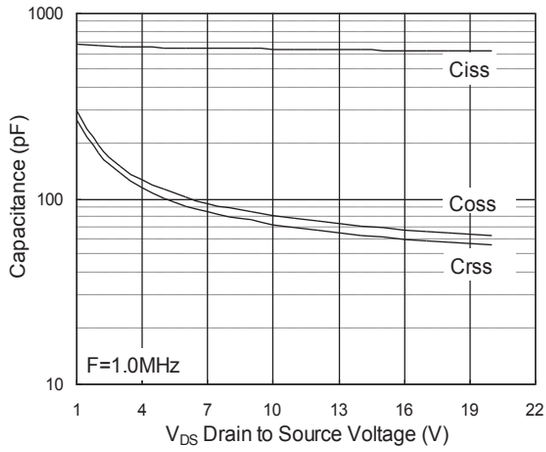


Fig.7 Capacitance

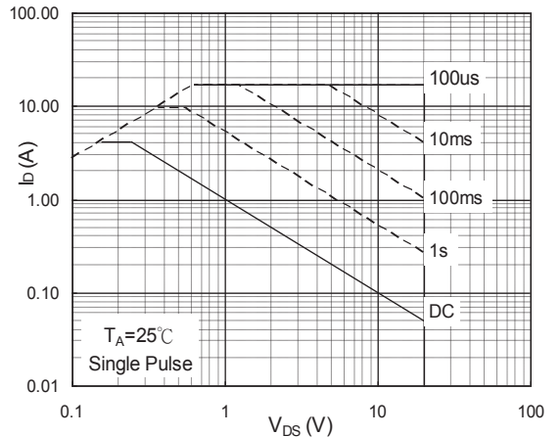


Fig.8 Safe Operating Area

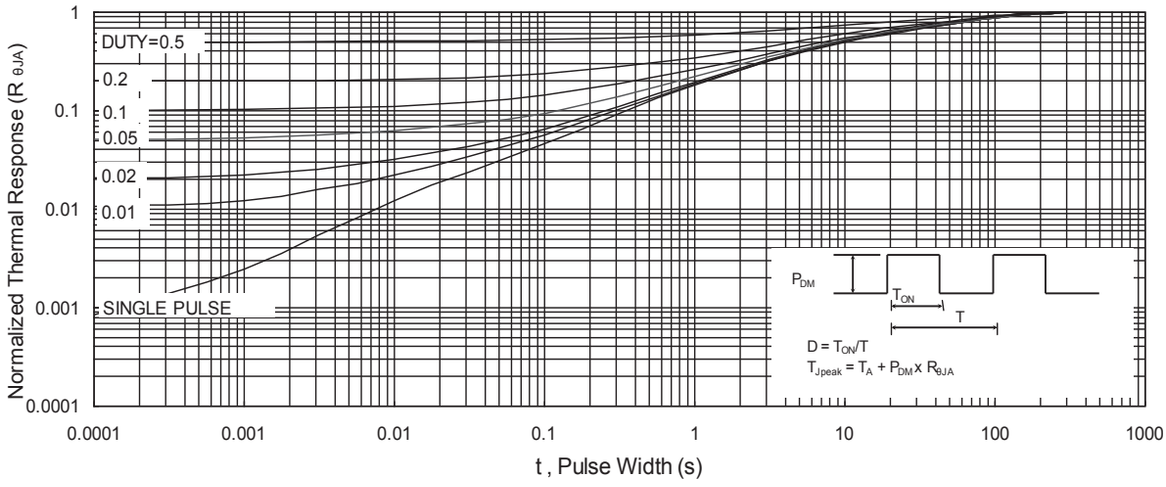


Fig.9 Normalized Maximum Transient Thermal Impedance

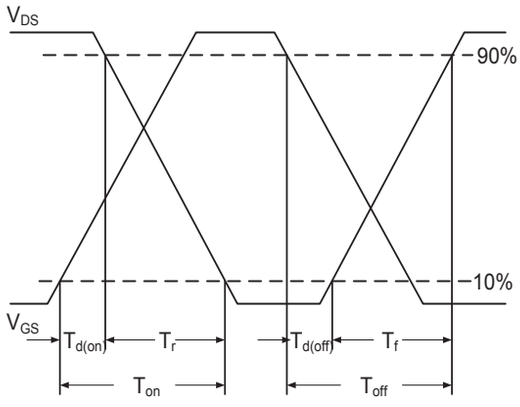


Fig.10 Switching Time Waveform

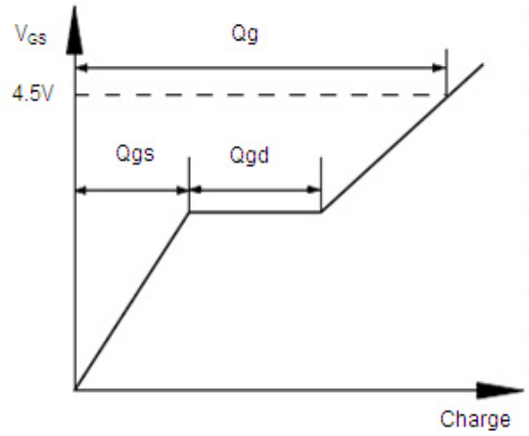


Fig.11 Gate Charge Waveform