# 单 N 沟道 MOSFET

ELM43400CB-S



## ■概要

ELM43400CB-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=30V
- Id=5.8A
- Rds(on) = 27mΩ (Vgs=10V)
- Rds(on) = 32mΩ (Vgs=4.5V)
- Rds(on) = 40mΩ (Vgs=2.5V)

## ■绝对最大额定值

如没有特别注明时, Ta=25℃

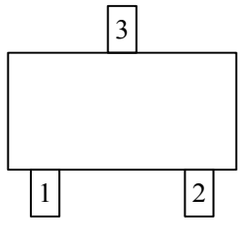
| 项目 | | 记号 | 规格范围 | 单位 | 备注 |
|---|---|---|---|---|---|
| 漏极 – 源极电压 | | Vds | 30 | V | |
| 栅极 – 源极电压 | | Vgs | ± 12 | V | |
| 漏极电流（定常） | Ta=25℃ | Id | 5.8 | A | |
| | Ta=70℃ | | 4.9 | | |
| 漏极电流（脉冲） | | Idm | 20 | A | 2 |
| 容许功耗 | Tc=25℃ | Pd | 1 | W | 3 |
| 保存温度范围 | | Tstg | – 55 ~ 150 | ℃ | |
| 结合部温度范围 | | Tj | – 55 ~ 150 | | |

## ■热特性

| 项目 | | 记号 | 典型值 | 最大值 | 单位 | 备注 |
|---|---|---|---|---|---|---|
| 结合部 – 周边环境热阻 | | Rθja | – | 125 | ℃/W | 1 |
| | t ≤ 10s | | – | 85 | ℃/W | |

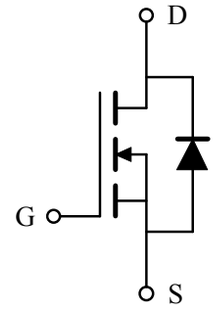
## ■引脚配置图

SOT-23(俯视图)




| 引脚编号 | 引脚名称 |
|---|---|
| 1 | GATE |
| 2 | SOURCE |
| 3 | DRAIN |

## ■电路图



## ■电特性

如没有特别注明时, Ta=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 | 30 | – | – | V | |
| 栅极接地时漏极电流 | Idss | Vds=24V,Vgs=0V | – | – | 1 | μA | |
| | | Vds=24V,Vgs=0V, Ta=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 | 0.5 | – | 1.2 | V | |
| 漏极 – 源极导通电阻 | Rds(on) | Vgs=10V, Id=5.8A | – | – | 27 | mΩ | 2 |
| | | Vgs=4.5V, Id=5.0A | – | – | 32 | | |
| | | Vgs=2.5V, Id=4.0A | – | – | 40 | | |
| 正向跨导 | Gfs | Vds=5V, Id=5A | – | 25 | – | 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 | – | – | 5.8 | A | 1, 4 |
| 动态特性 | | | | | | | |
| 输入电容 | Ciss | Vgs=0V, Vds=15V, f=1MHz | – | 860 | – | pF | |
| 输出电容 | Coss | | – | 84 | – | pF | |
| 反馈电容 | Crss | | – | 70 | – | pF | |
| 栅极电阻 | Rg | Vgs=0V, Vds=0V, f=1MHz | – | 1.5 | – | Ω | |
| 开关特性 | | | | | | | |
| 总栅极电荷 (4.5V) | Qg | Vgs=4.5V, Vds=15V, Id=5.8A | – | 11.5 | – | nC | |
| 栅极 – 源极电荷 | Qgs | | – | 1.6 | – | nC | |
| 栅极 – 漏极电荷 | Qgd | | – | 2.9 | – | nC | |
| 导通延迟时间 | td(on) | Vgs=10V, Vds=15V , Id=5A Rgen=3Ω | – | 5 | – | ns | |
| 导通上升时间 | tr | | – | 47 | – | ns | |
| 关闭延迟时间 | td(off) | | – | 26 | – | ns | |
| 关闭下降时间 | tf | | – | 8 | – | ns | |

备注：

1. 测试值是安装在表面为1平方英寸2盎司铜箔的 FR-4 基板的状态下取得的值；
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. 数据在理论上是与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

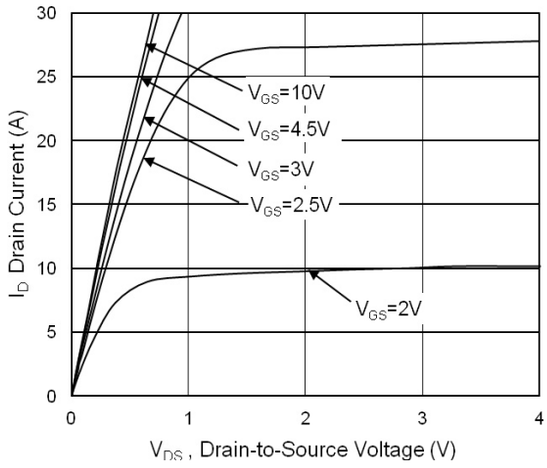



Fig.1 Typical Output Characteristics

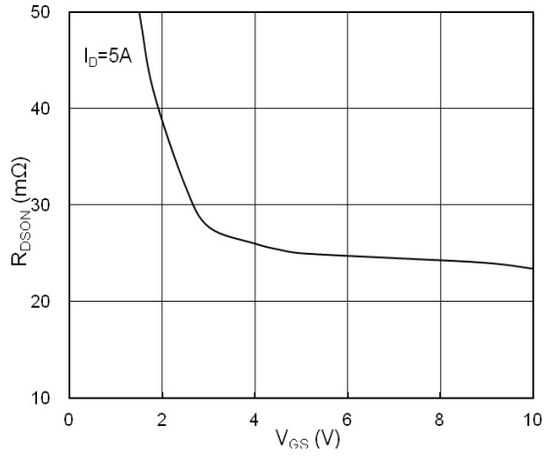



Fig.2 On-Resistance vs. Gate-Source

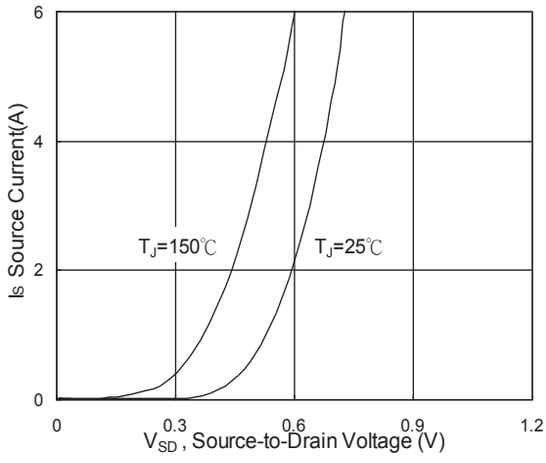



Fig.3 Source Drain Forward Characteristics

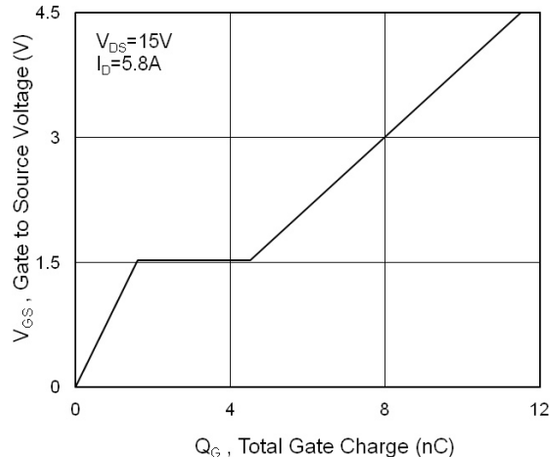



Fig.4 Gate-Charge Characteristics

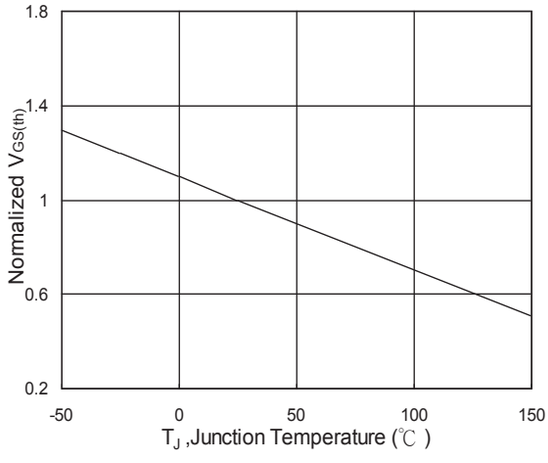



Fig.5 Normalized $V_{GS(th)}$ vs. $T_J$

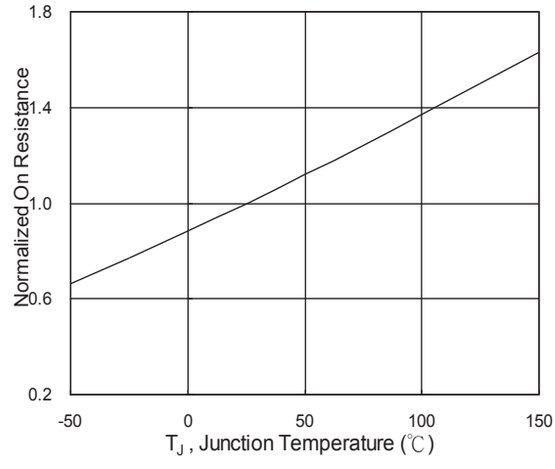



Fig.6 Normalized $R_{DSON}$ vs. $T_J$

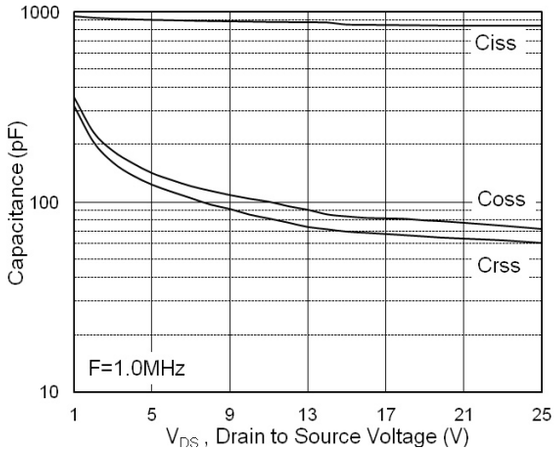



Fig.7 Capacitance

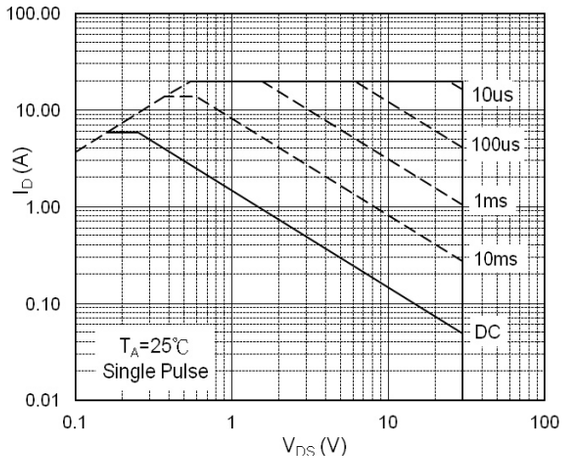



Fig.8 Safe Operating Area

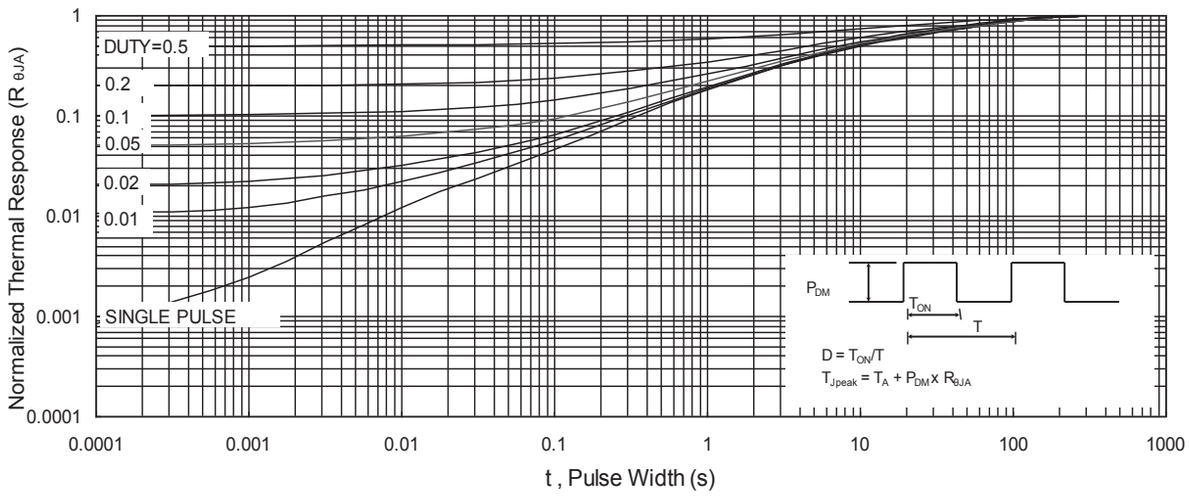



Fig.9 Normalized Maximum Transient Thermal Impedance

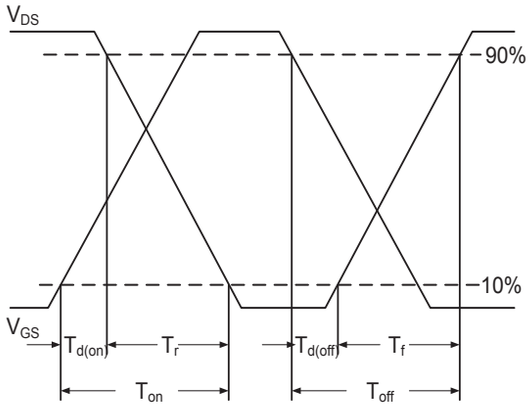



Fig.10 Switching Time Waveform

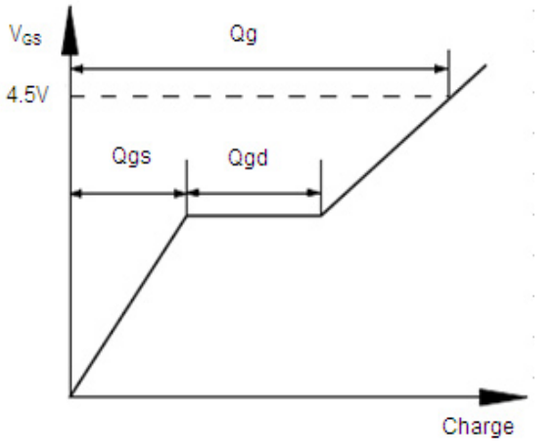



Fig.11 Gate Charge Waveform