描述 / Descriptions

SOT-23 塑封封装 N 沟道 MOS 场效应管。
N- CHANNEL MOSFET in a SOT-23 Plastic Package.

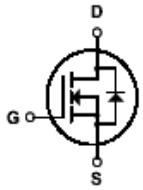
特征 / Features

芯片采用超高密度圆胞设计技术，$R_{DS(ON)}$导通电阻小，SOT-23 封装，符合 AEC-Q101 标准高可靠性要求，无卤产品。
Super high dense cell design for low $R_{DS(ON)}$,SOT-23 package, Qualified to AEC-Q101 Standards for High Reliability, HF Product.

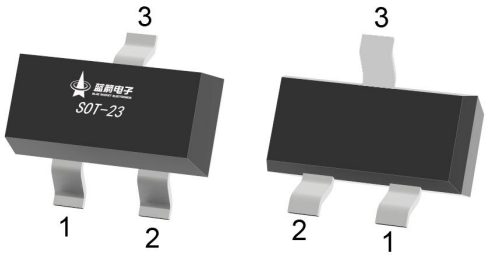
用途 / Applications

电池管理，高速开关，低功率 DC-DC 转换，满足汽车应用的严格要求。
Battery management,High speed switch,low power DC to DC converter, Meet the stringent requirements of automotive applications.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



PIN1：G　　PIN 2：S　　PIN 3：D

印章代码 / Marking

Marking	Q310

极限参数 / Absolute Maximum Ratings(Ta=25℃)

参数 Parameter		符号 Symbol	数值 Rating	单位 Unit
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current – Continuous		I_D	3.0	A
Pulsed Drain Current		I_{DM}	15	A
Power Dissipation		P_D	0.9	W
Storage Temperature Range		T_{stg}	-55～150	℃
Maximum Junction-to-Ambient	t ≤ 10s	$R_{\theta JA}$	55	℃/W
Maximum Junction-to-Ambient	Steady-State		80	
Maximum Junction-to-Lead	Steady-State	$R_{\theta JL}$	40	

电性能参数 / Electrical Characteristics(Ta=25℃)

参数 Parameter	符号 Symbol	测试条件 Test Conditions		最小值 Min	典型值 Typ	最大值 Max	单位 Unit
Drain–Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0	I_D=10μA	60	68		V
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0	V_{DS}=60V			1.0	μA
Gate–Body Leakage.	I_{GSS}	V_{GS}=±20V	V_{DS}=0V			±100	nA
Static Drain–Source On–Resistance	$R_{DS(on)1}$	V_{GS}=10V	I_D=3A		84	90	mΩ
	$R_{DS(on)2}$	V_{GS}=4.5V	I_D=3A		94	110	mΩ
Drain–Source Diode Forward Voltage	V_{SD}	V_{GS}=0V	I_D=1A		0.75	1.2	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}	I_D=50μA	1.0	1.8	3.0	V
Maximum Body-Diode Continuous Current	I_S					3	A

电性能参数 / Electrical Characteristics(Ta=25℃)

Input Capacitance	Ciss	VGS=0V, VDS=25V f=1MHz		415		pF
Output Capacitance	Coss			37		
Reverse Transfer Capacitance	Crss			25		
Gate resistance	Rg	VGS=0V, VDS=0V f=1MHz		3.4		Ω
Total Gate Charge	Qg(10V)	VGS=10V, VDS=30V ID=4.2A		10	12	nC
Total Gate Charge	Qg(4.5V)			5	6	
Gate Source Charge	Qgs			2		
Gate Drain Charge	Qgd			3		
Turn–On Delay Time	$t_{d(on)}$	VGS=10V, VDS=30V RL=7Ω, RGEN=3Ω			7	ns
Turn–On Rise Time	t_r				4	
Turn–Off Delay Time	$t_{d(off)}$				20	
Turn–Off Fall Time	t_f				3	

电参数曲线图 / Electrical Characteristic Curve

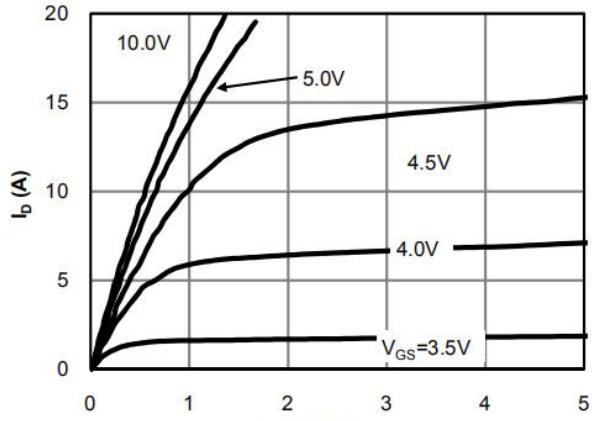


Fig 1: On-Region Characteristics

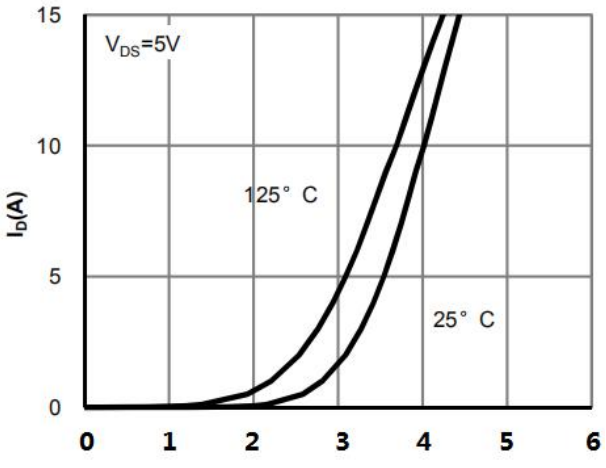


Figure 2: Transfer Characteristics

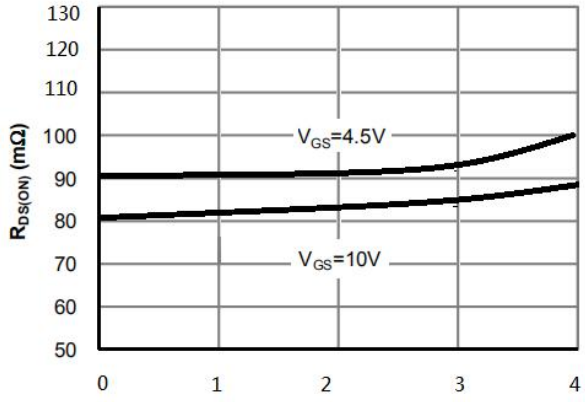


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

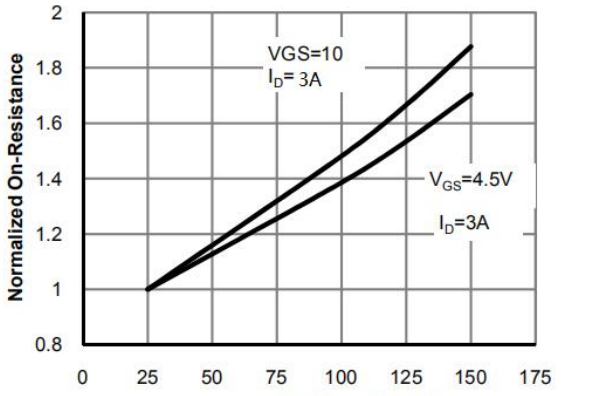


Figure 4: On-Resistance vs. Junction Temperature

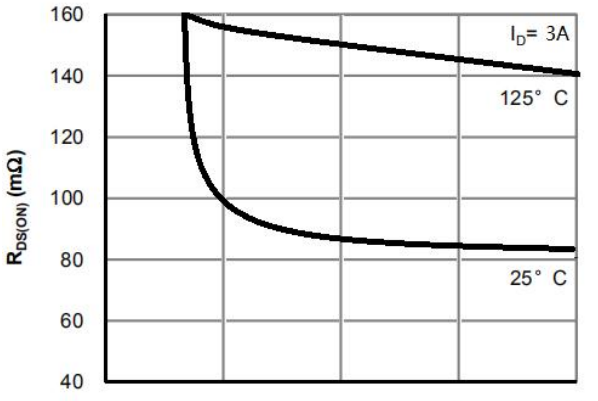


Figure 5: On-Resistance vs. Gate-Source Voltage

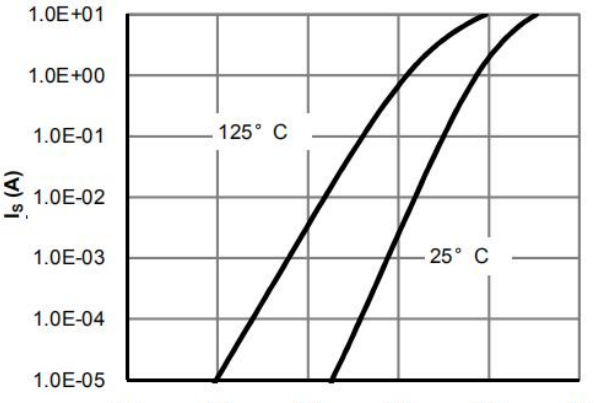


Figure 6: Body-Diode Characteristics

电参数曲线图 / Electrical Characteristic Curve

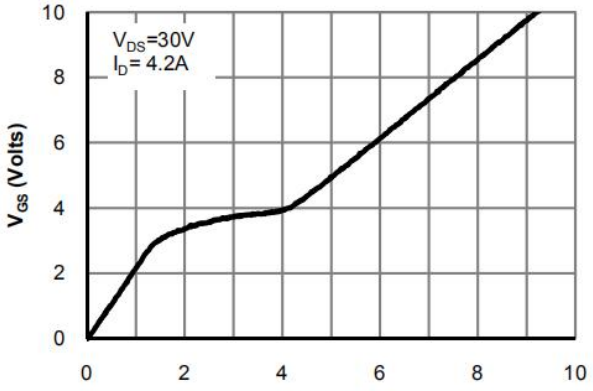


Figure 7: Gate-Charge Characteristics

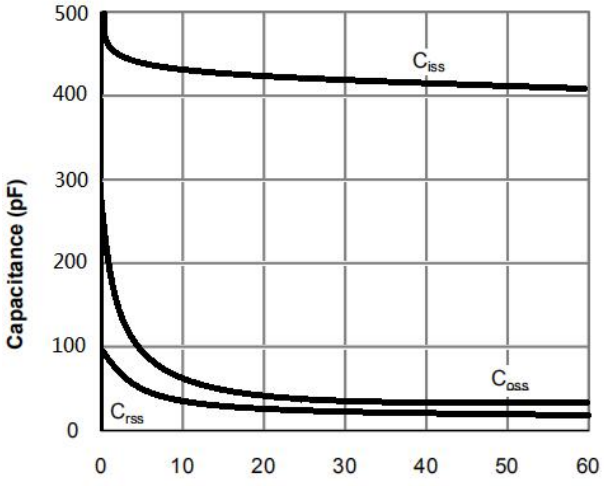


Figure 8: Capacitance Characteristics

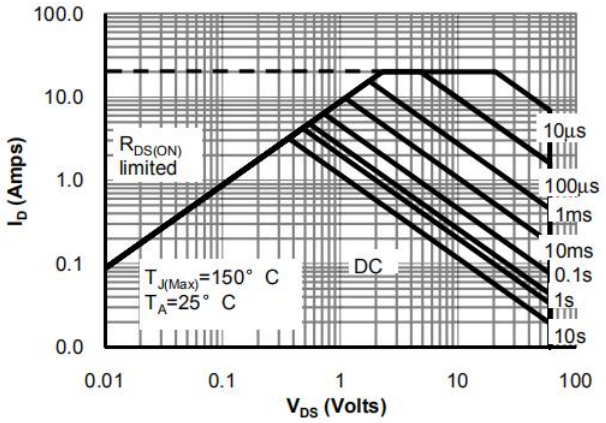


Figure 9: Maximum Forward Biased Safe Operating Area

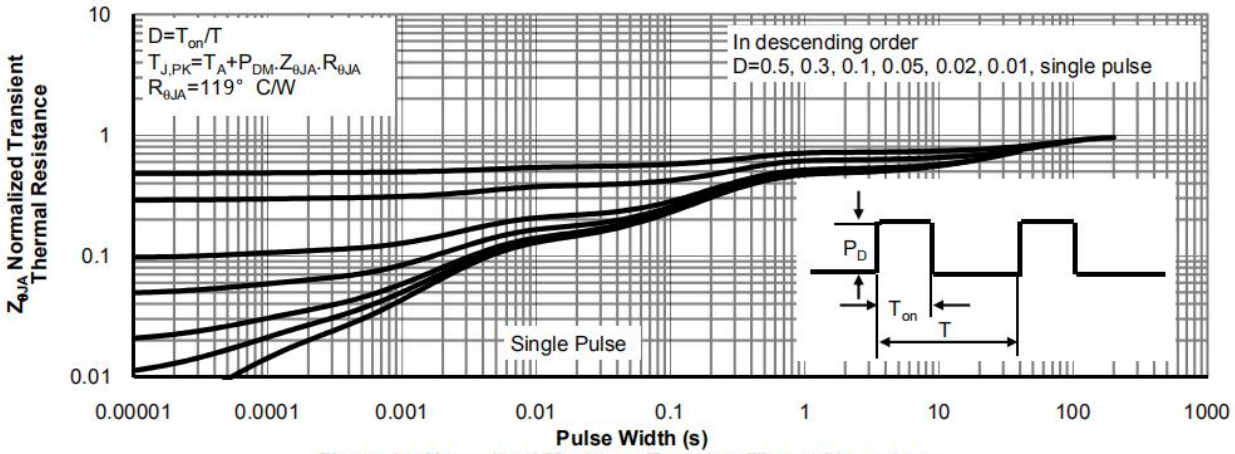
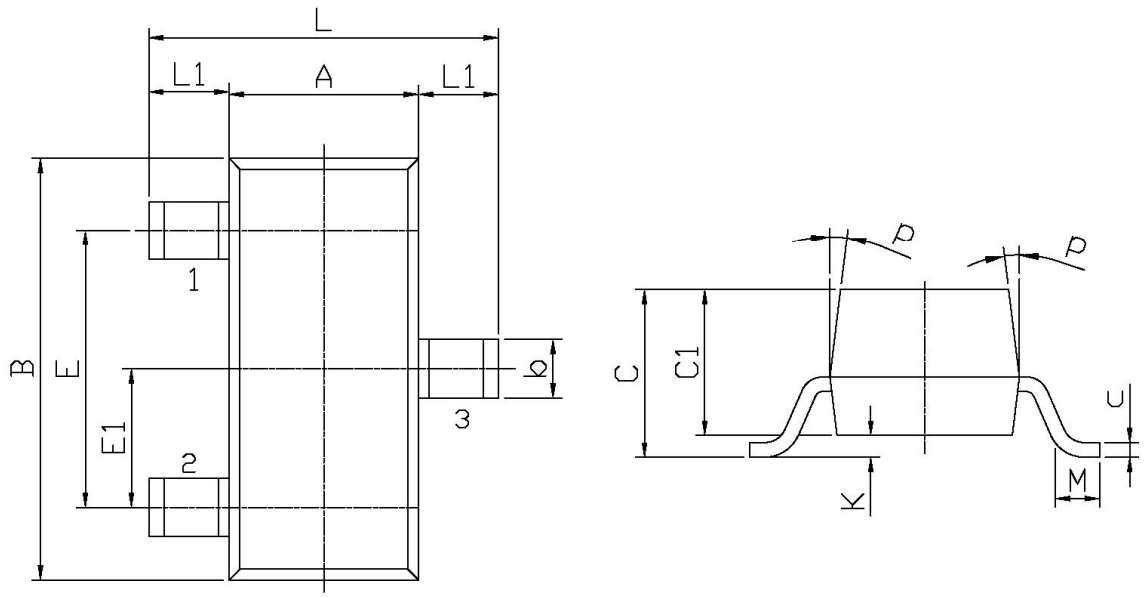


Figure 10 Normalized Maximum Transient Thermal Impedance

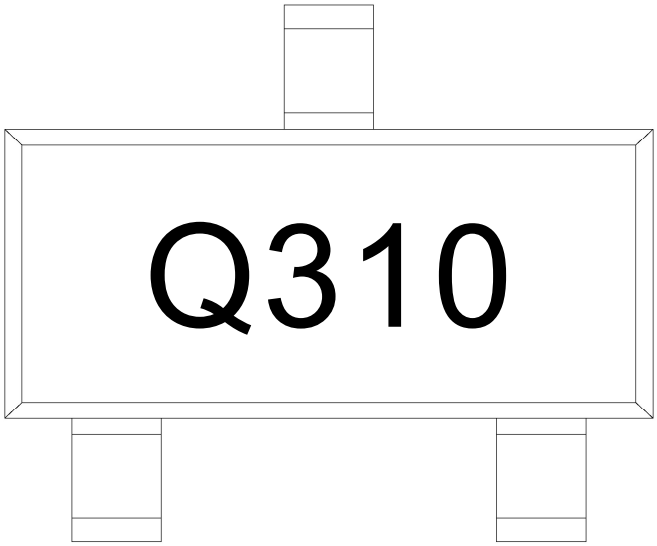
外形尺寸图 / Package Dimensions

SOT-23 单位：mm



Symbol	Dimensions In Millmeters		Symbol	Dimensions In Millmeters	
	Min	Max		Min	Max
L	2.2	2.7	C	1.30Max	
L1	0.45	0.65	C1	0.90	1.20
A	1.15	1.50	c	0.05	0.20
B	2.70	3.10	K	0	0.10
E	1.70	2.10	M	0.20MIN	
E1	0.85	1.05	P	7°	
b	0.35	0.55			

印章说明 / Marking Instructions



说明：

Q： 为汽车无卤产品标识

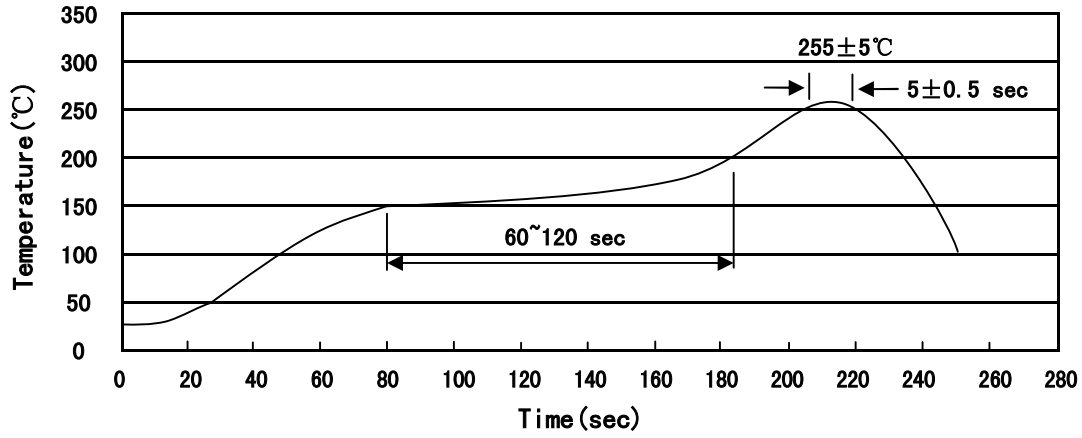
310: 为型号代码

Note:

Q: Automobile halogen-free product Code

310： Product Type Code

回流焊温度曲线图(无铅) / Temperature Profile for IR Reflow Soldering(Pb-Free)



说明：

1、预热温度 150～200℃，时间 60～120sec;

2、峰值温度 255±5℃，时间持续为 5±0.5sec;

3、焊接制程冷却速度为 2～10℃/sec.

Note:

1.Preheating:150~200℃, Time:60~120sec.

2.Peak Temp.:255±5℃, Duration:5±0.5sec.

3. Cooling Speed: 2~10℃/sec.

耐焊接热试验条件 / Resistance to Soldering Heat Test Conditions

温度：260±5℃ 时间：10±1 sec. Temp.:260±5℃ Time:10±1 sec

包装规格 / Packaging SPEC.

卷盘包装 / REEL

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm^3)		
	Units/Reel 只/卷盘	Reels/Inner Box 卷盘/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Reel	Inner Box 盒	Outer Box 箱
SOT-23	3,000	10	30,000	6	180,000	7″ ×8	180×120×180	390×385×205

使用说明 / Notices