描述 / Descriptions

TO-263 塑封封装 N 沟道场效应管。
N-CHANNEL MOSFET in a TO-263 Plastic Package.

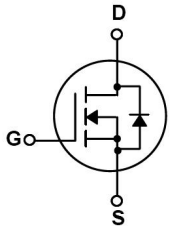
特征 / Features

低电阻,开关速度快，符合 AEC-Q101 标准高可靠性要求，无卤产品。
Ultra Low On-Resistance,fast switching, Qualified to AEC-Q101 Standards for High Reliability, HF Product.

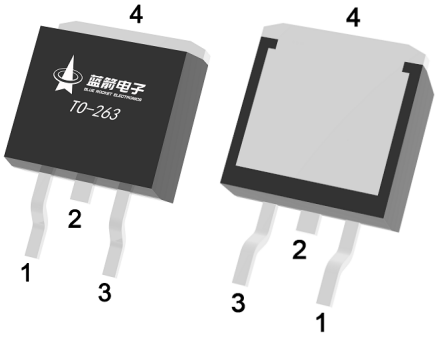
用途 / Applications

该器件适用于高效电源模块，主动式 PFC 电路和基于半桥拓扑结构的电子节能灯，满足汽车应用的严格要求。
These devices are well suited for high efficient switched mode power supplies，Active power factor correction, electronic lamp ballast based on half bridge topology, Meet the stringent requirements of automotive applications.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



PIN1：G　　PIN 2、4：D　　PIN 3：S

印章代码 / Marking

见印章说明。 See Marking Instructions.

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}	40	V
Drain Current		I_D(Tc=25℃)	120	A
Pulsed Drain Current		I_{DM}	480	A
Gate-Source Voltage		V_{GS}	±20	V
Single Pulsed Avalanche Energy L=0.5mH		E_{AS}	482	mJ
Avalanche Current		I_{AS}	35	A
Total Power Dissipation		P_D(Tc=25℃)	187	W
Junction and Storage Temperature Range		T_J,T_{STG}	-55 to 175	℃
Thermal Resistance-Junction to Ambient	t ≤ 10s	$R_{\theta JA}$	15	℃/W
	Steady-State		60	
Thermal Resistance-Junction to Case	Steady-State	$R_{\theta JC}$	0.7	

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	BV_{DSS}	V_{GS}=0V I_D=250μA	40	44		V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V V_{GS}=0V			1	μA
Gate-Body Leakage Current Forward	I_{GSS}	V_{GS}=±20V V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=250μA	1	1.6	3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V I_D=20A		1.6	2	mΩ
		V_{GS}=4.5V I_D=10A		2.1	4	
Forward On Voltage	V_{SD}	V_{GS}=0V I_S=1A			1.2	V
Input Capacitance	C_{iss}	V_{DS}=25V V_{GS}=0V f=1MHz		11000		pF
Output Capacitance	C_{oss}			840		
Reverse Transfer Capacitance	C_{rss}			650		

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
Gate resistance	R_g	f=1MHz		1.45		Ω
Total Gate Charge	Q_g(10V)	V_{GS}=10V V_{DS}=20V I_D=20A		68		nC
Total Gate Charge	Q_g(4.5V)			28		
Gate Source Charge	Q_{gs}			16.5		
Gate Drain Charge	Q_{gd}			4.5		
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=10V V_{DS}=20V R_L=1Ω R_{GEN}=3Ω		12.5		ns
Turn-On Rise Time	t_r			9.5		
Turn-Off Delay Time	$t_{d(off)}$			57.5		
Turn-Off Fall Time	t_f			10.5		

电参数曲线图 / Electrical Characteristic Curve

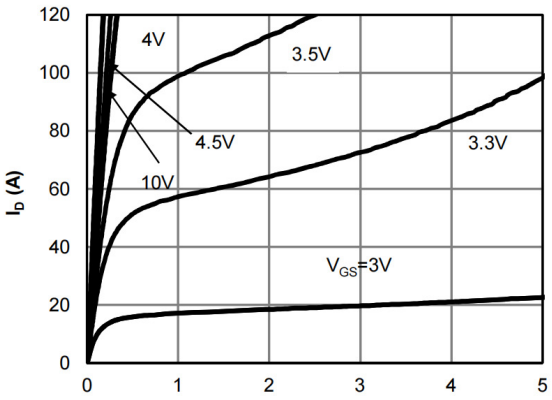


Figure 1: On-Region Characteristics

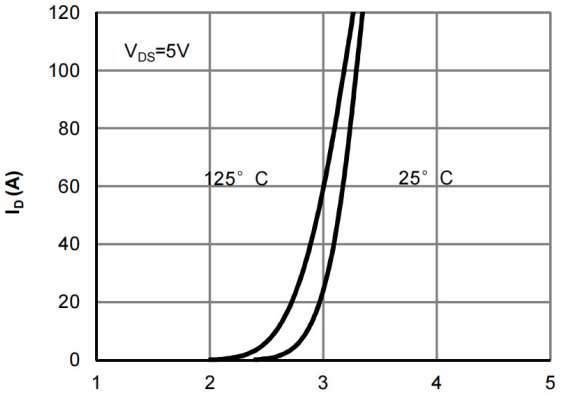


Figure 2: Transfer Characteristics

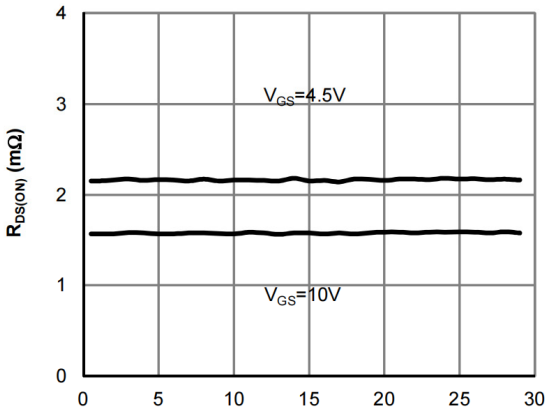


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

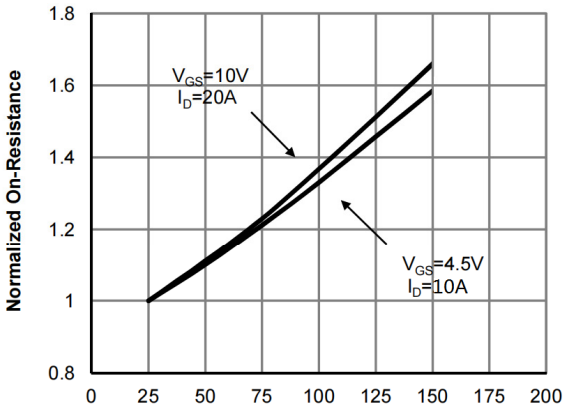


Figure 4: On-Resistance vs. Junction Temperature

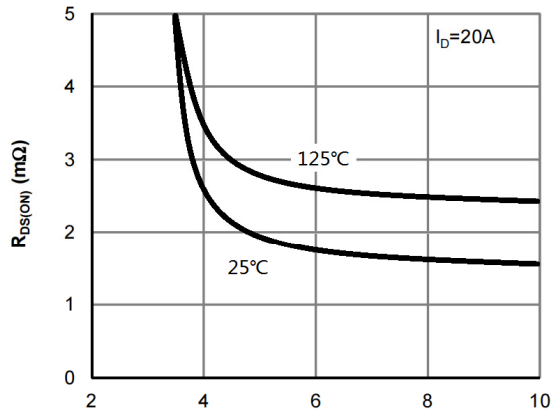


Figure 5: On-Resistance vs. Gate-Source Voltage

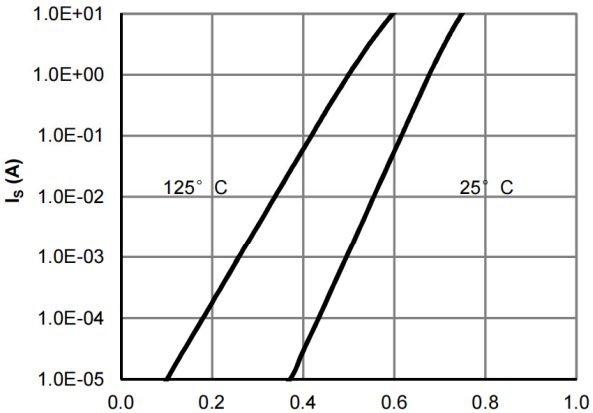


Figure 6: Body-Diode Characteristics

电参数曲线图 / Electrical Characteristic Curve

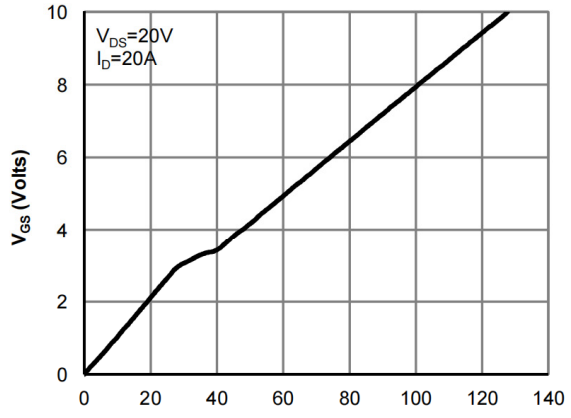


Figure 7: Gate-Charge Characteristics

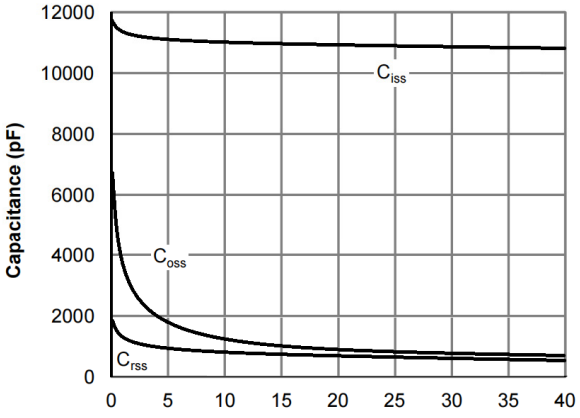
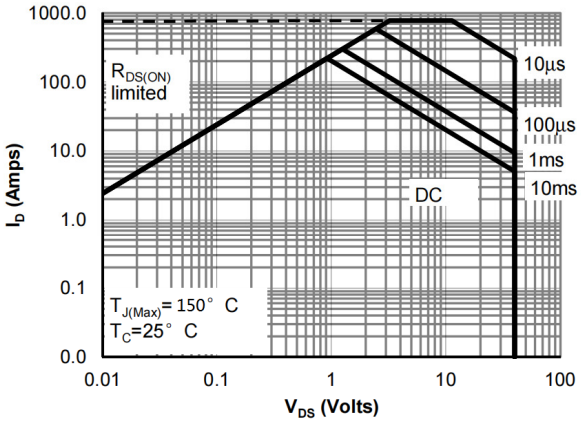


Figure 8: Capacitance Characteristics



V_{GS}> or equal to 4.5V
Figure 9: Maximum Forward Biased Safe Operating Area

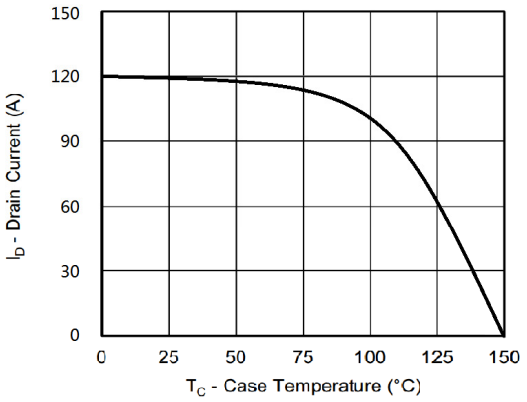


Figure10. Maximum Continuous Drain Current vs Case Temperature

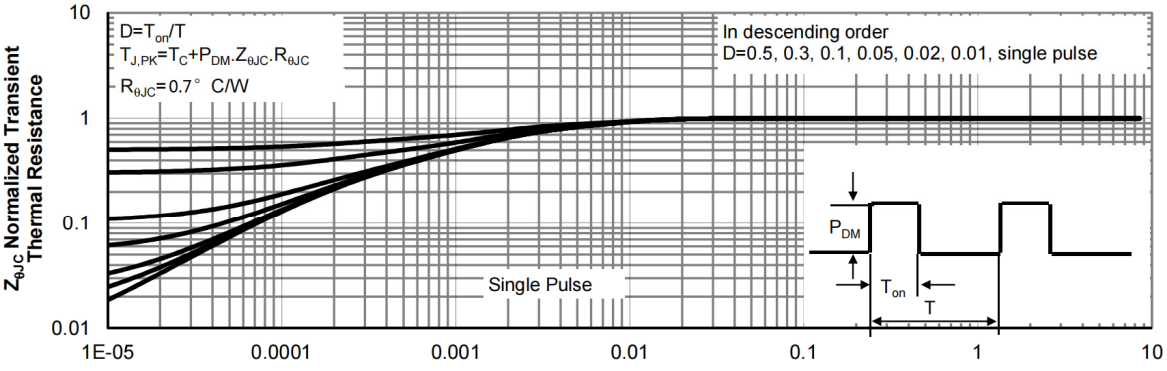
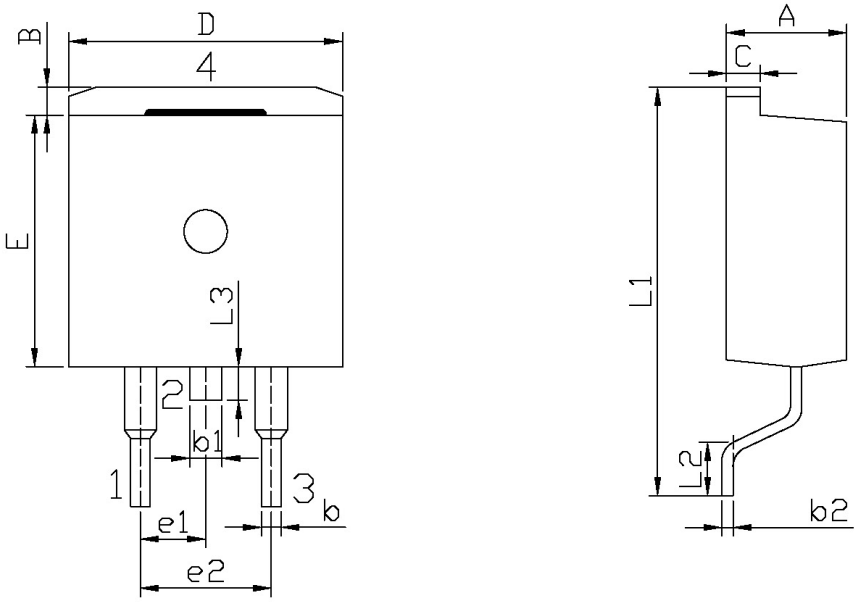


Figure 11: Normalized Maximum Transient Thermal Impedance

外形尺寸图 / Package Dimensions

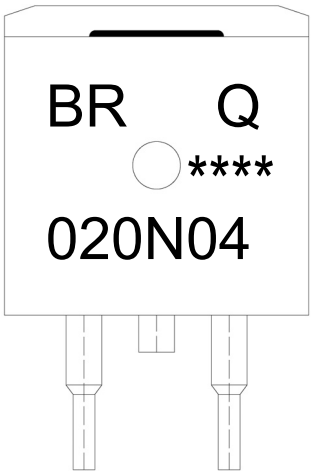


单位：mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	4.30	4.70	E	9.00	9.40
B	1.00	1.40	e1	2.34	2.74
b	0.70	0.90	e2	4.88	5.28
b1	1.15	1.35	L1	15.00	16.00
b2	0.40	0.60	L2	2.24	2.84
C	1.20	1.40	L3	1.20	1.60
D	9.80	10.20			

TO-263

印章说明 / Marking Instructions



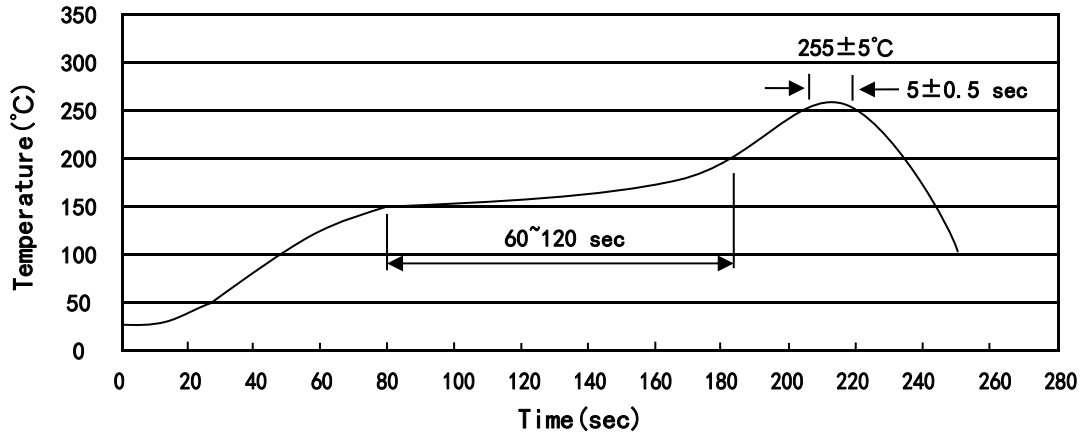
说明：

BR：	为公司代码
Q：	为汽车无卤产品标识
020N04：	为型号代码
****：	为生产批号代码，随生产批号变化

Note:

BR:	Company Code
Q:	Automobile halogen-free product Code
020N04:	Product Type
****:	Lot No. Code, code change with Lot No

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



说明：	Note:
1、预热温度 150～200℃，时间 60～120sec;	1.Preheating:150~200℃, Time:60~120sec.
2、峰值温度 255±5℃，时间持续为 5±0.5sec;	2.Peak Temp.:255±5℃, Duration:5±0.5sec.
3、焊接制程冷却速度为 2～10℃/sec.	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：mm³)		
	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
TO-263	800	1	800	6	4,800	13″ ×24	360×360×50	380×335×366

套管包装 / TUBE

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit：mm³)		
	Units/Tube 只/套管	Tubes/Inner Box 套管/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Tube 套管	Inner Box 盒	Outer Box 箱
TO-263	50	20	1,000	5	5,000	532×33×7.0	555×164×50	575×290×180

使用说明 / Notices