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.

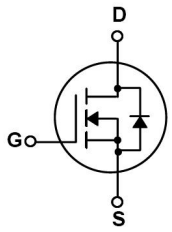
特征 / Features

低电阻,开关速度快。
Ultra Low On-Resistance,fast switching.

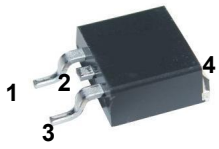
用途 / Applications

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。
These devices are well suited for high efficient switched mode power supplies，Active power factor correction, electronic lamp ballast based on half bridge topology.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



PIN1：G　　PIN 2、4：D　　PIN 3：S

放大及印章代码 / h_{FE} Classifications & 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 [G]	I_D(Tc=25℃)	240	A
	I_D(Tc=100℃)	156	A
Pulsed Drain Current [C]	I_{DM}	960	A
Gate-Source Voltage	V_{GS}	±20	V
Single Pulsed Avalanche Energy L=0.5mH [C]	E_{AS}	229.8	mJ
Avalanche Current [C]	I_{AS}	33.2	A
Total Power Dissipation [B]	P_D(Tc=25℃)	293.8	W
Junction and Storage Temperature Range	T_J,T_{STG}	-55 to 175	℃
Thermal Resistance-Junction to Case	$R_{\theta JC}$	0.51	℃/W
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	61.3	℃/W

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			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V V_{GS}=0V			1	μA
		T_J=125℃			5	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	2	2.6	4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V I_D=20A		2.0	3	mΩ
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		9130		pF
Output Capacitance	C_{oss}			668		
Reverse Transfer Capacitance	C_{rss}			493		

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		2.23		Ω
Total Gate Charge	Q_g(10V)	V_{GS}=10V V_{DS}=20V I_D=20A		128	180	nC
Total Gate Charge	Q_g(4.5V)			54	80	
Gate Source Charge	Q_{gs}			29		
Gate Drain Charge	Q_{gd}			11		
Output Charge	Q_{oss}	V_{GS}=0V V_{DS}=20V		67		nC
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=10V V_{DS}=20V R_L=1Ω R_{GEN}=3Ω		16		ns
Turn-On Rise Time	t_r			16		
Turn-Off Delay Time	$t_{d(off)}$			125		
Turn-Off Fall Time	t_f			27		
Body Diode Reverse Recovery Time	t_{rr}	I_F=20A, di/dt=500A/ms		29		ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=20A, di/dt=500A/ms		107		nC

A. The value of RqJA is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C. The Power dissipation PDSM is based on R qJA t≤ 10s and the maximum allowed junction temperature of 175°C. The value in any given application depends on the user's specific board design, and the maximum temperature of 175°C may be used if the PCB allows it.

B. The power dissipation PD is based on TJ(MAX)=175°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C. Single pulse width limited by junction temperature TJ(MAX)=175°C.

D. The RqJA is the sum of the thermal impedance from junction to case RqJC and case to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using <300ms pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of TJ(MAX)=175°C. The SOA curve provides a single pulse rating.

G. The maximum current rating is package limited.

H. These tests are performed with the device mounted on 1 in2 FR-4 board with 2oz. Copper, in a still air environment with TA=25°C.

电参数曲线图 / Electrical Characteristic Curve

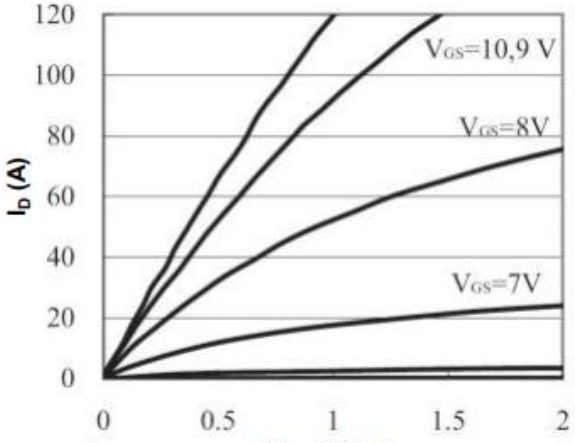


Fig 1: On-Region Characteristics

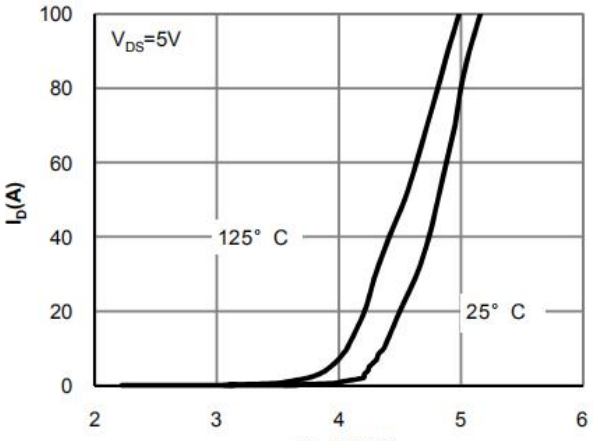


Figure 2: Transfer Characteristics

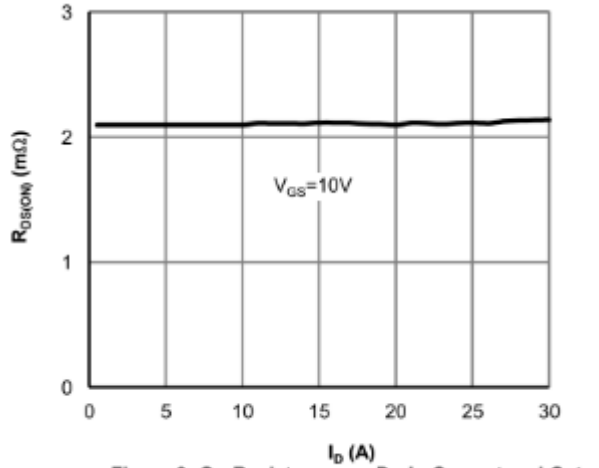


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

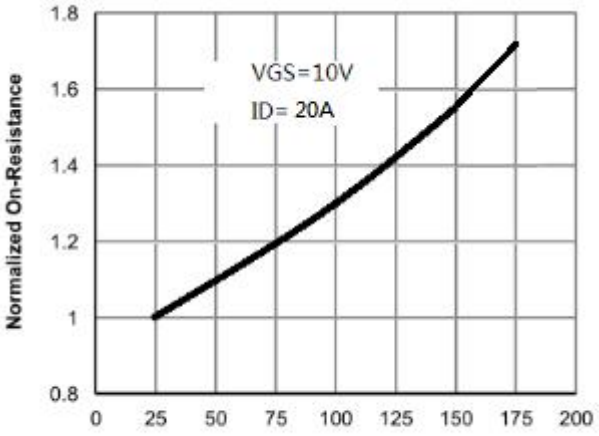


Figure 4: On-Resistance vs. Junction Temperature

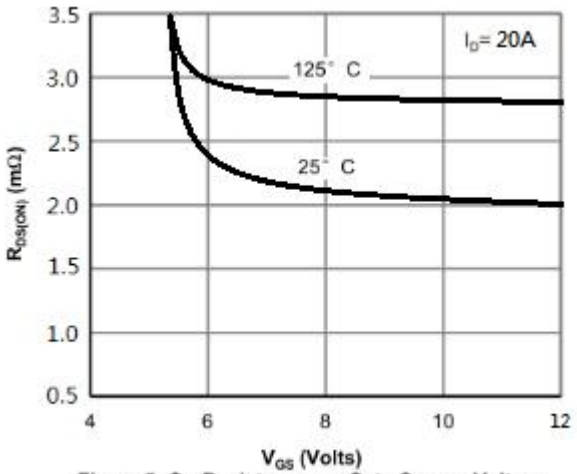


Figure 5: On-Resistance vs. Gate-Source Voltage

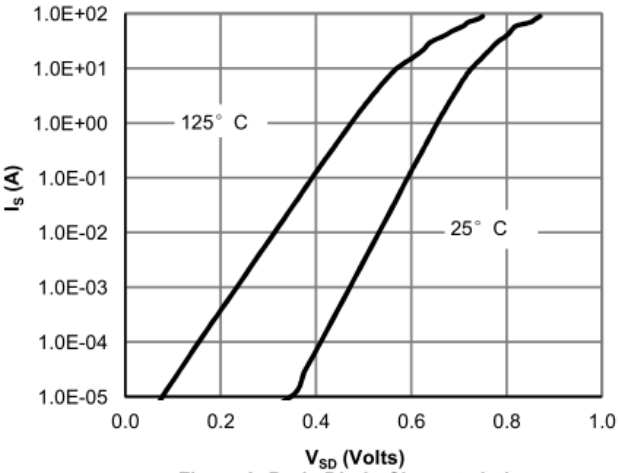


Figure 6: Body-Diode Characteristics

电参数曲线图 / Electrical Characteristic Curve

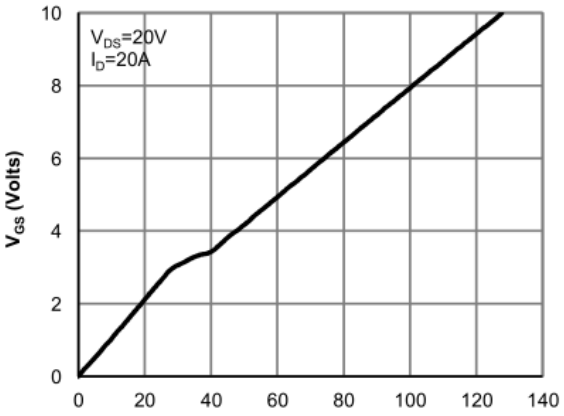


Figure 7: Gate-Charge Characteristics

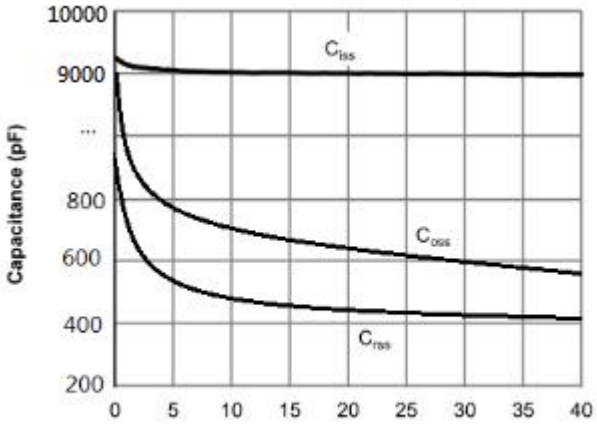


Figure 8: Capacitance Characteristics

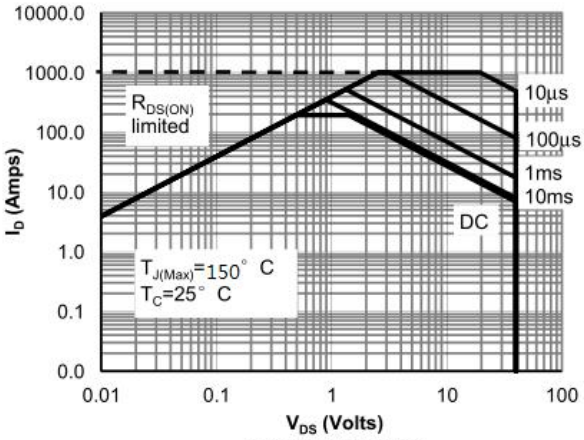


Figure 9: Maximum Forward Biased Safe Operating Area

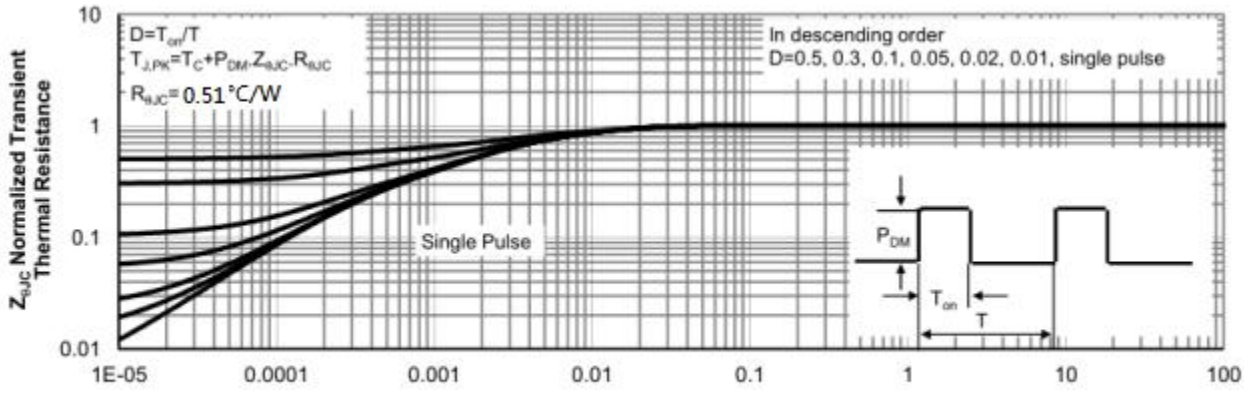
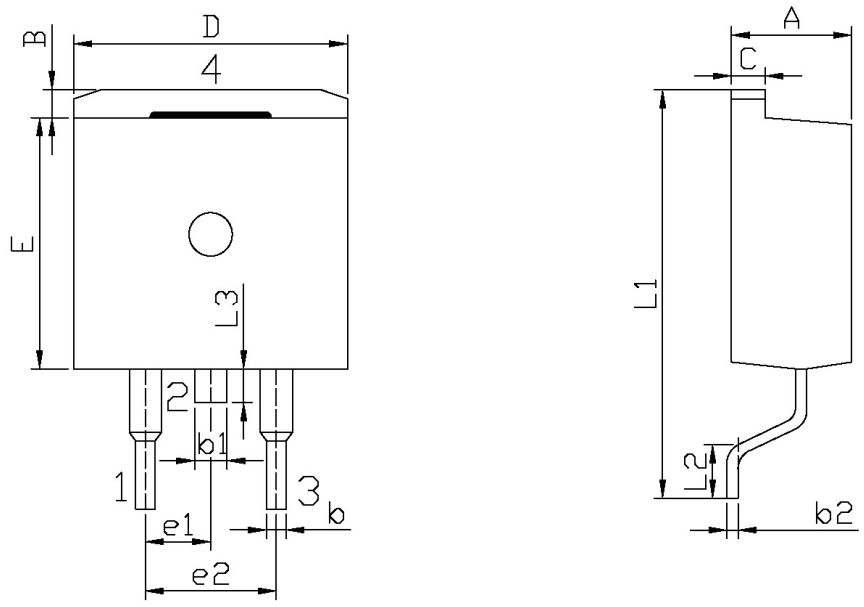


Figure 10: Normalized Maximum Transient Thermal Impedance

外形尺寸图 / Package Dimensions

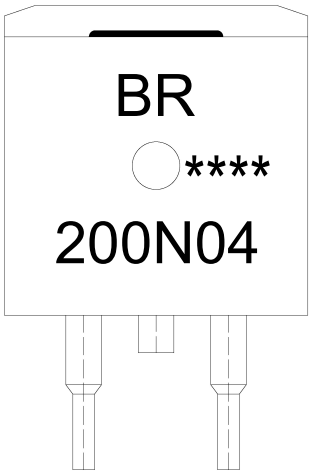


单位：mm

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



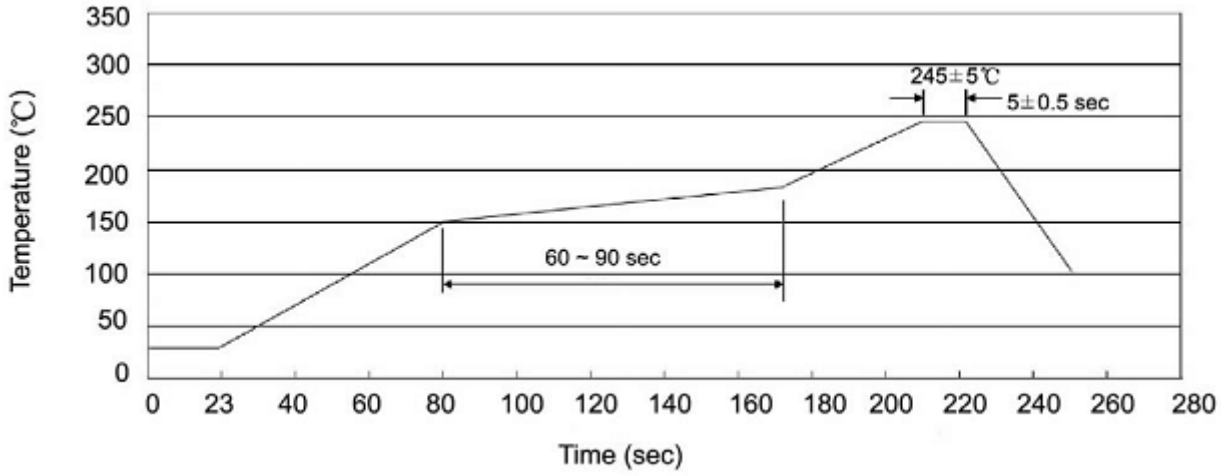
说明：

BR：	为公司代码
200N04：	为型号代码
****：	为生产批号代码，随生产批号变化。

Note:

BR:	Company Code
200N04:	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：

1、预热温度 25～150℃，时间 60～90sec;

2、峰值温度 245±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:25~150℃, Time:60~90sec.

2.Peak Temp.:245±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: 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	5	4,000	13″ ×24	360×360×50	385×257×392

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