

描述 / Descriptions

N 沟道 TO-252 塑封封装场效应管。

N-CHANNEL MOSFET in a TO-252 Plastic Package.

特征 / Features

具有低导通电阻的超高密度设计，表面贴装封装。无卤产品。

Super high dense cell design for low $R_{DS(on)}$, Rugged and reliable, surface mount package.

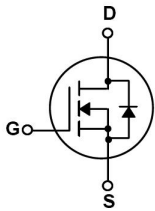
Halogen-free Product.

用途 / Applications

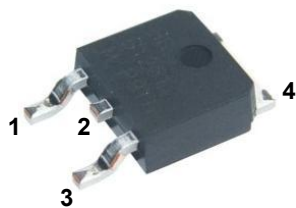
用于高功率 DC/DC 转换和功率开关。

These devices are well suited for high efficiency switching DC/DC converters and switch mode power supplies.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



PIN 1 : G

PIN 2 : D

PIN 3 : S

PIN 4 : D

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°C)

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit	
Drain-Source Voltage	V_{DSS}	30	V	
Drain Current	$I_D(T_C=25^\circ\text{C})$	80	A	
Drain Current - Pulsed	I_{DM}	300	A	
Gate-Source Voltage	V_{GSS}	± 20	V	
Single Pulsed Avalanche Energy	E_{AS}	211	mJ	
Avalanche Current	I_{AS}	23	A	
Power Dissipation	$P_D(T_C=25^\circ\text{C})$	90	W	
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$	
Junction-to-Ambient	$t \leq 10$	$R_{\theta JA}$	$^\circ\text{C/W}$	
Junction-to-Ambient	Steady-State			18
Junction-to-Ambient	Steady-State			45
Junction-to-Case	Steady-State	$R_{\theta JC}$	1.38	

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

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}	$V_{GS}=0V$	$I_D=250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V$	$V_{GS}=0V$			1	μA
Gate-Body Leakage Current Forward	I_{GSS}	$V_{GS}=\pm 20V$	$V_{DS}=0V$			± 0.1	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$	$I_D=250\mu A$	1.0	1.7	2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$	$I_D=70A$		4.8	6.5	m Ω
		$V_{GS}=4.5V$	$I_D=35A$		7.0	9	m Ω
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V$	$I_S=10A$			1.2	V
Input Capacitance	C_{iss}	$V_{DS}=25V$ $f=1.0MHz$	$V_{GS}=0V$		2090		pF
Output Capacitance	C_{oss}				790		
Reverse Transfer Capacitance	C_{rss}				634		
Gate resistance	R_g	$V_{GS}=0V$ $f=1MHz$	$V_{DS}=0V$		1.9		Ω
Total Gate Charge	$Q_{g(10V)}$	$V_{GS}=10V$ $I_D=20A$	$V_{DS}=15V$		30	42	nC
Total Gate Charge	$Q_{g(4.5V)}$				14	20	
Gate Source Charge	Q_{gs}				5.1		
Gate Drain Charge	Q_{gd}				6.3		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=10V$ $R_L=0.75\Omega$	$V_{DS}=15V$ $R_{GEN}=3\Omega$		8		ns
Turn-On Rise Time	t_r				4		
Turn-Off Delay Time	$t_{d(off)}$				29		
Turn-Off Fall Time	t_f				5.5		
Body Diode Reverse Recovery Time	t_{rr}	$I_F=20A, di/dt=500A/us$			16.5		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=20A, di/dt=500A/us$			34.2		nC

电参数曲线图 / Electrical Characteristic Curve

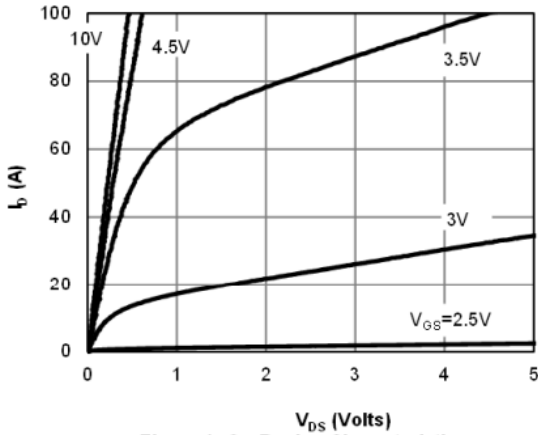


Figure 1: On-Region Characteristics

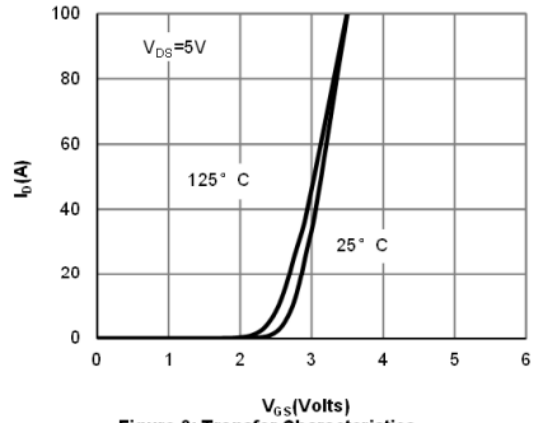


Figure 2: Transfer Characteristics

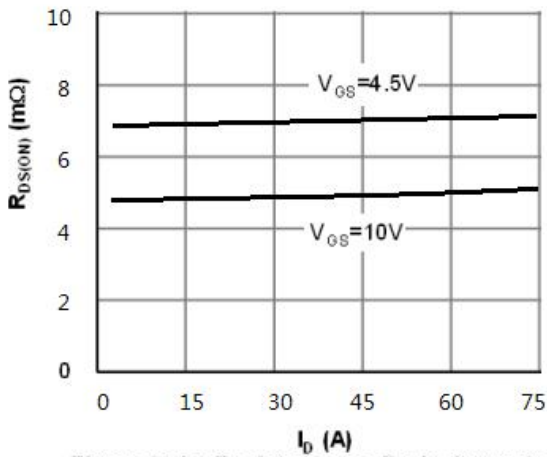


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

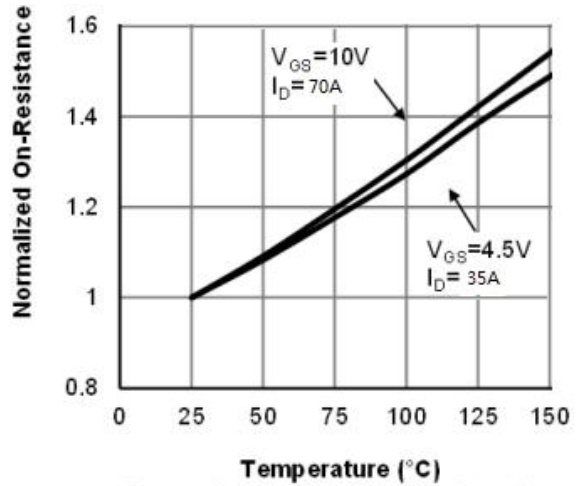


Figure 4: On-Resistance vs. Junction Temperature

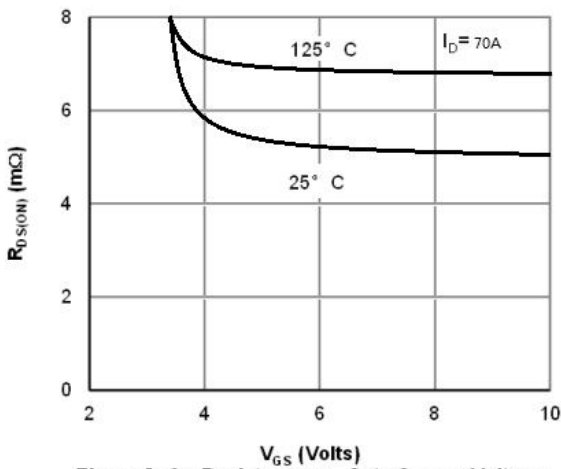


Figure 5: On-Resistance vs. Gate-Source Voltage

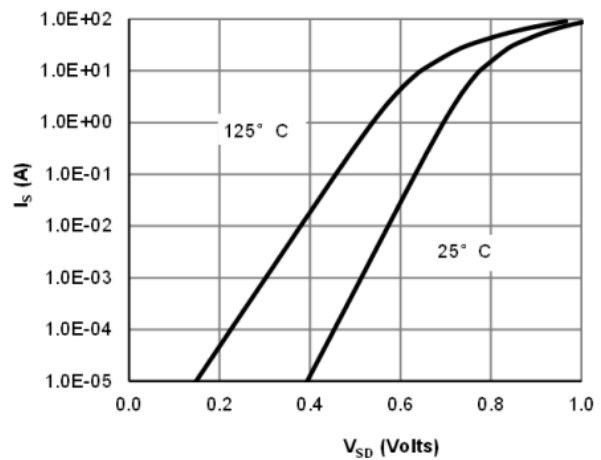


Figure 6: Body-Diode Characteristics

电参数曲线图 / Electrical Characteristic Curve

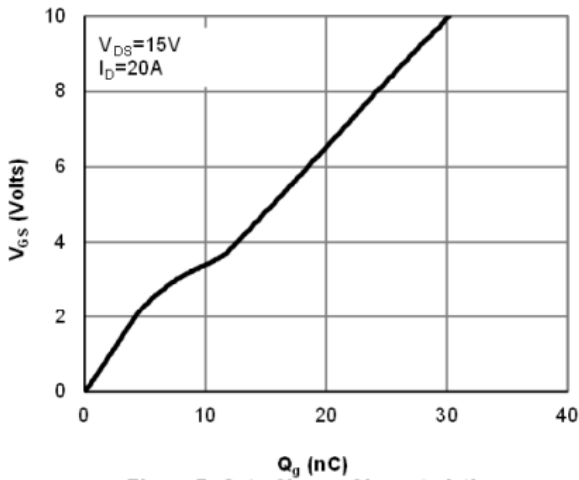


Figure 7: Gate-Charge Characteristics

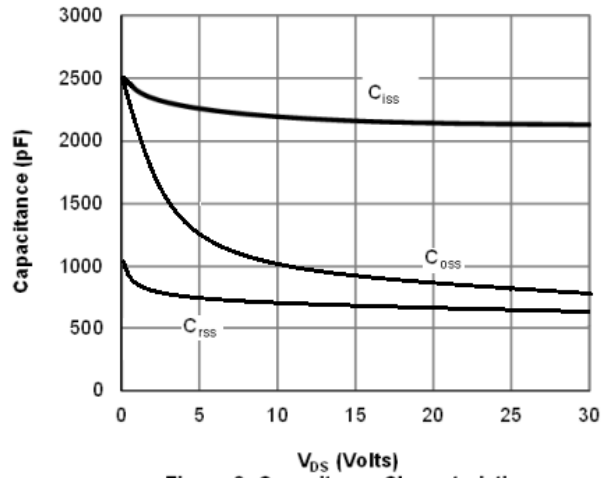


Figure 8: Capacitance Characteristics

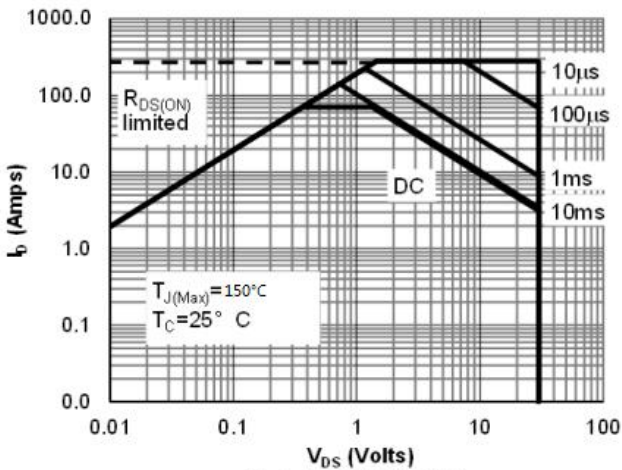


Figure 9: Maximum Forward Biased Safe Operating Area
 $V_{GS} > \text{or equal to } 4.5V$

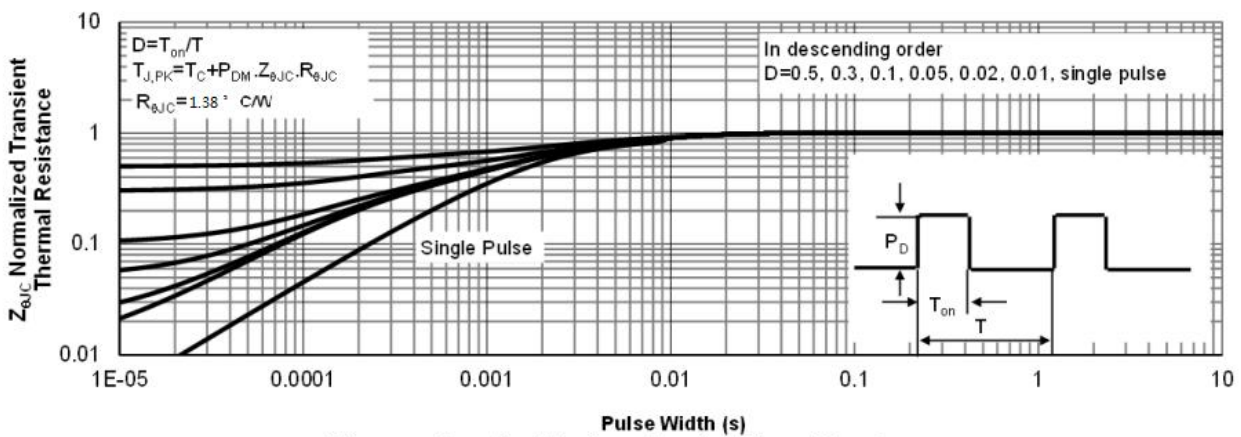
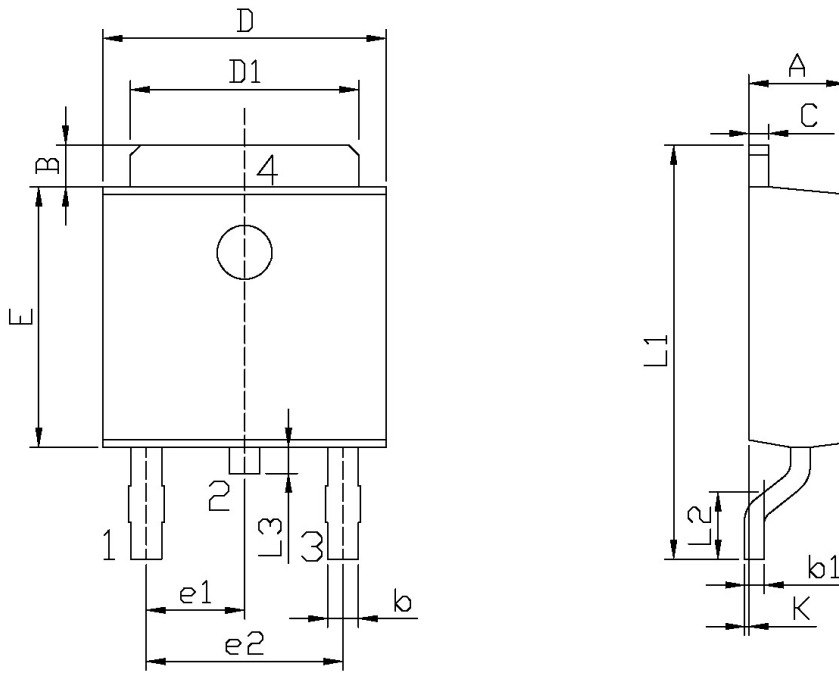


Figure 10: Normalized Maximum Transient Thermal Impedance

外形尺寸图 / Package Dimensions

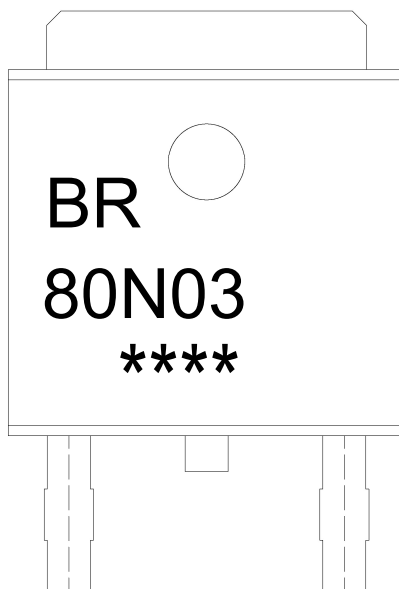


单位: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	2.20	2.40	E	5.95	6.25
B	0.95	1.25	e1	2.24	2.34
b	0.50	0.70	e2	4.43	4.73
b1	0.45	0.55	L1	9.45	9.95
C	0.45	0.55	L2	1.25	1.75
D	6.45	6.75	L3	0.60	0.90
D1	5.10	5.50	K	0.00	0.10

T0-252

印章说明 / Marking Instructions



说明：

BR： 为公司代码

80N03： 为型号代码

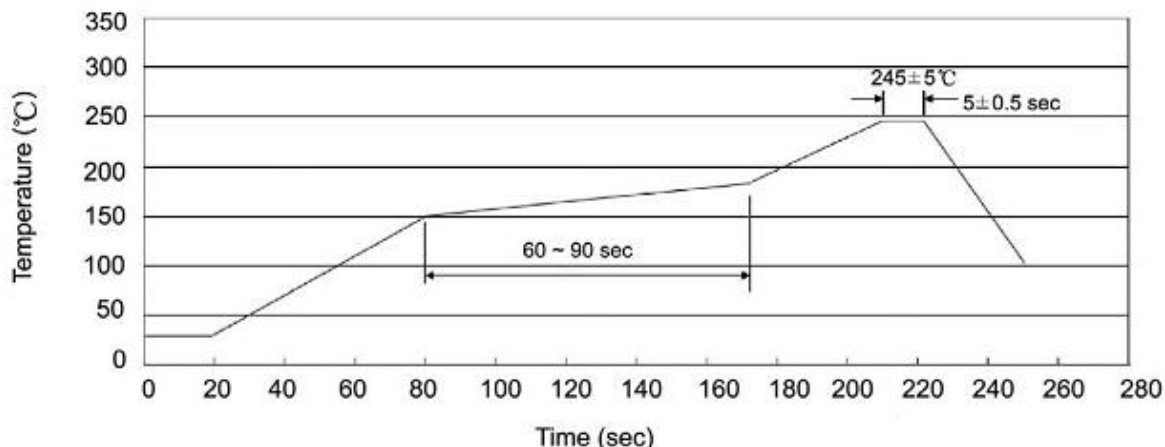
****： 为生产批号代码，随生产批号变化

Note:

BR: Company Code.

80N03: Product Type Code.

****: 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 150 ~ 180°C，时间 60 ~ 90sec;
- 2、峰值温度 245±5°C，时间持续为 5±0.5sec;
- 3、焊接制程冷却速度为 2 ~ 10°C/sec.

Note:

- 1.Preheating:150~180°C, Time:60~90sec.
- 2.Peak Temp.:245±5°C, Duration:5±0.5sec.
3. Cooling Speed: 2~10°C/sec.

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

温度：260±5°C

时间：10±1 sec.

Temp.:260±5°C

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
TO-252	2,500	2	5,000	5	25,000	13" × 16	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: mm ³)		
	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-251/252	75	48	3,600	5	18,000	526×20.5×5.25	555×164×50	575×290×180

使用说明 / Notices