

描述 / Descriptions

TO-252 塑封封装 N 沟道 MOS 场效应管。

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

特征 / Features

$V_{DS} = 650V$ $I_D = 4A$ ($V_{GS} = \pm 30V$)

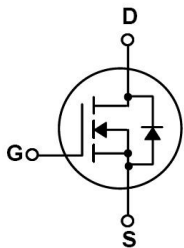
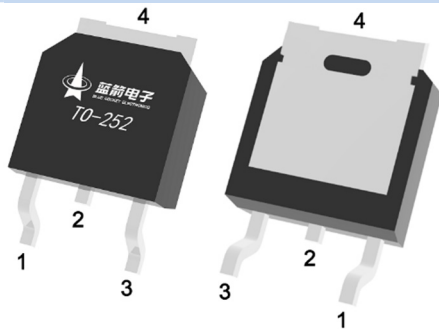
$R_{DS(ON)}@10V \leq 2.5\Omega$ (Typ. 2.15Ω)

无卤产品。HF Product.

用途 / Applications

开关电源、不间断电源(UPS)、电视电源、适配器/充电器。

Switch Mode Power Supply, Uninterruptible Power Supply (UPS), TV Power, Adapter/Charger.

内部等效电路 / Equivalent Circuit**引脚排列 / Pinning**

PIN1 : G

PIN 2 : D

PIN 3 : S

PIN 4 : D

印章代码 / Marking

见印章说明。

See Marking Instructions.

极限参数 / Absolute Maximum Ratings($T_c=25^\circ\text{C}$)

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Drain-Source Voltage	V_{DS}	650	V
Drain Current	$I_D(T_c=25^\circ\text{C})$	4.0	A
Drain Current	$I_D(T_c=100^\circ\text{C})$	2.5	A
Drain Current - Pulsed	I_{DM}	16	A
Gate-Source Voltage	V_{GS}	± 30	V
Single Pulsed Avalanche Energy	E_{AS}	288	mJ
Continuous Diode Forward Current	I_S	4	A
Power Dissipation	$P_D(T_c=25^\circ\text{C})$	83	W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$
Junction to Ambient	$R_{\theta JA}$	62	$^\circ\text{C/W}$
Junction to Case	$R_{\theta JC}$	1.5	$^\circ\text{C/W}$

电性能参数 / Electrical Characteristics($T_c=25^\circ\text{C}$)

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_{DS}	$V_{GS}=0V$ $I_D=250\mu A$	650			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=650V$ $V_{GS}=0V$			1	μA
		$V_{DS}=520V$ $T_c=125^\circ\text{C}$			100	μA
Gate-Body Leakage Current Forward	I_{GSS}	$V_{GS}=\pm 30V$ $V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	2.0		4.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=2.0A$		2.15	2.5	Ω
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=4.0A$			1.5	V
Reverse Recovery Time	t_{rr}	$V_R = 400V$ $I_F = 4A, di_F/dt = 100A/\mu s$		159		ns
Reverse Recovery Charge	Q_{rr}			2.2		μC
Gate Resistance	R_g	$f=1.0MHz$		1.6		Ω
Input Capacitance	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0MHz$		617		pF
Output Capacitance	C_{oss}			53		pF
Reverse Transfer Capacitance	C_{rss}			3.0		pF

电性能参数 / Electrical Characteristics($T_C=25^{\circ}\text{C}$)

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
Total Gate Charge	Q_g	$V_{DD}=520\text{V}$ $I_D=4.0\text{A}$ $V_{GS}=10\text{V}$		17.3		nC
Gate-Source Charge	Q_{gs}			4.9		nC
Gate-Drain Charge	Q_{gd}			6.1		nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=325\text{V}$ $I_D=4.0\text{A}$ $R_G=25\Omega$		9		ns
Turn-On Rise Time	t_r			11		ns
Turn-Off Delay Time	$t_{d(off)}$			33		ns
Turn-Off Fall Time	t_f			15		ns

电参数曲线图 / Electrical Characteristic Curve

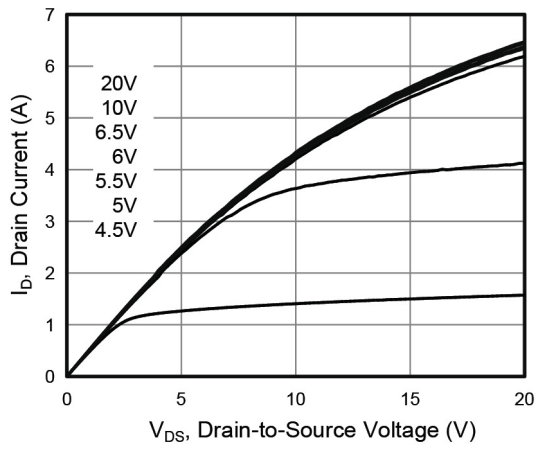


Figure 1. Output Characteristics

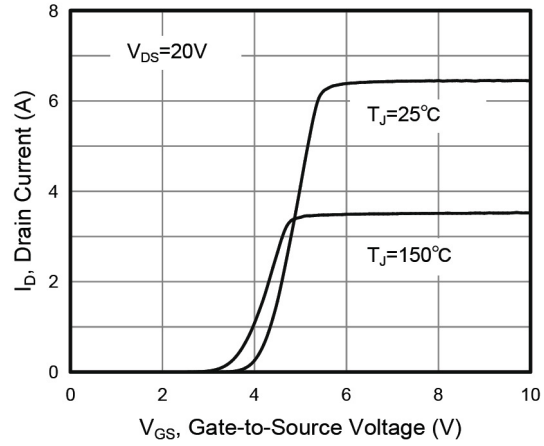


Figure 2. Transfer Characteristics

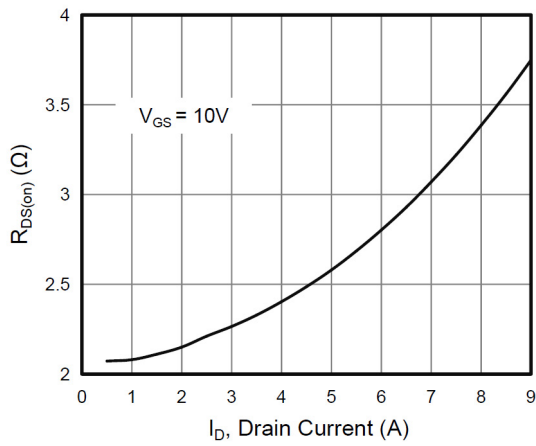


Figure 3. On-Resistance vs Drain Current

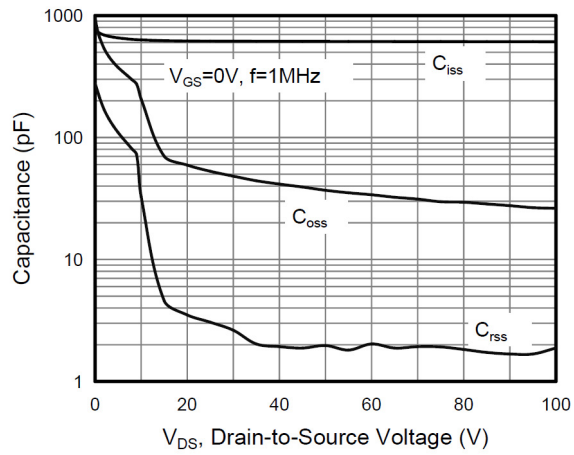


Figure 4. Capacitance

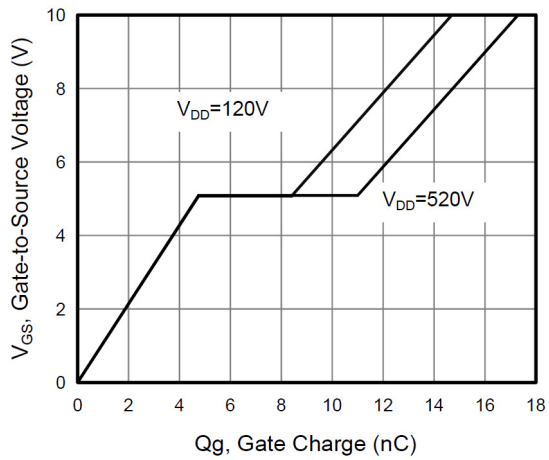


Figure 5. Gate Charge

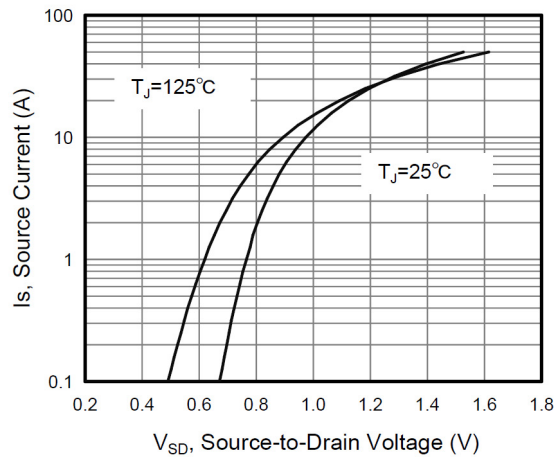


Figure 6. Body Diode Forward Voltage

电参数曲线图 / Electrical Characteristic Curve

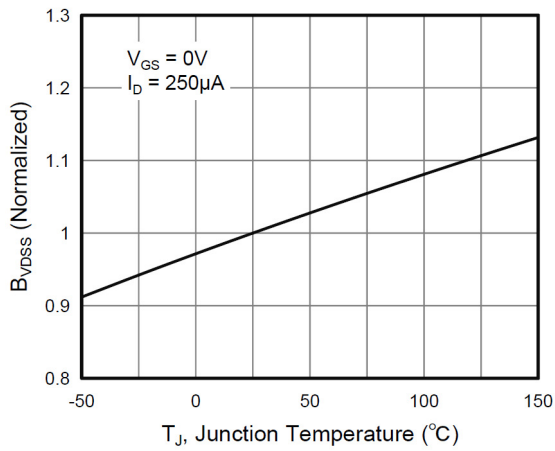


Figure 7 . Breakdown Voltage vs Junction Temperature

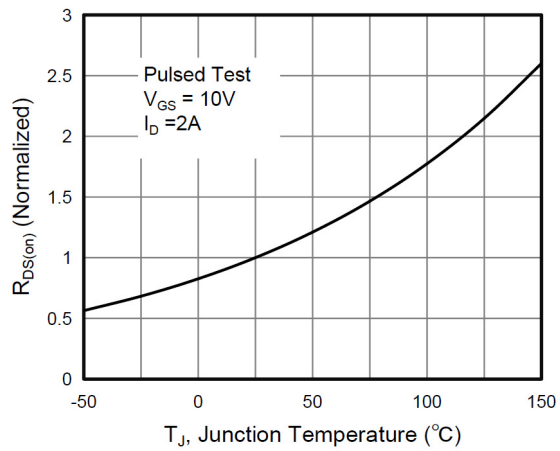


Figure 8 . On-Resistance vs Temperature

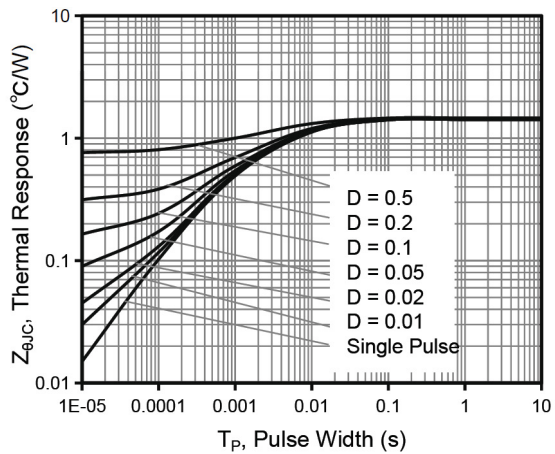


Figure 9. Transient Thermal Impedance

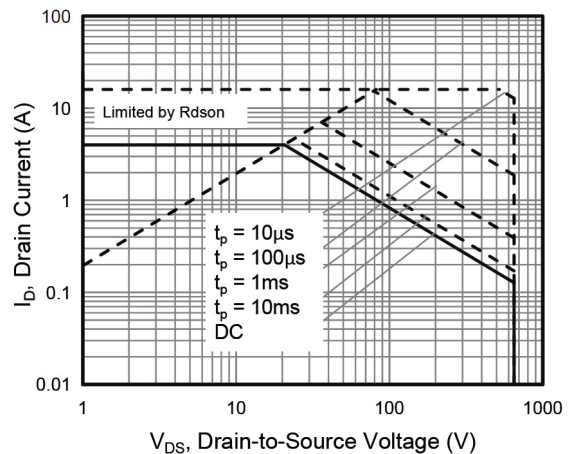
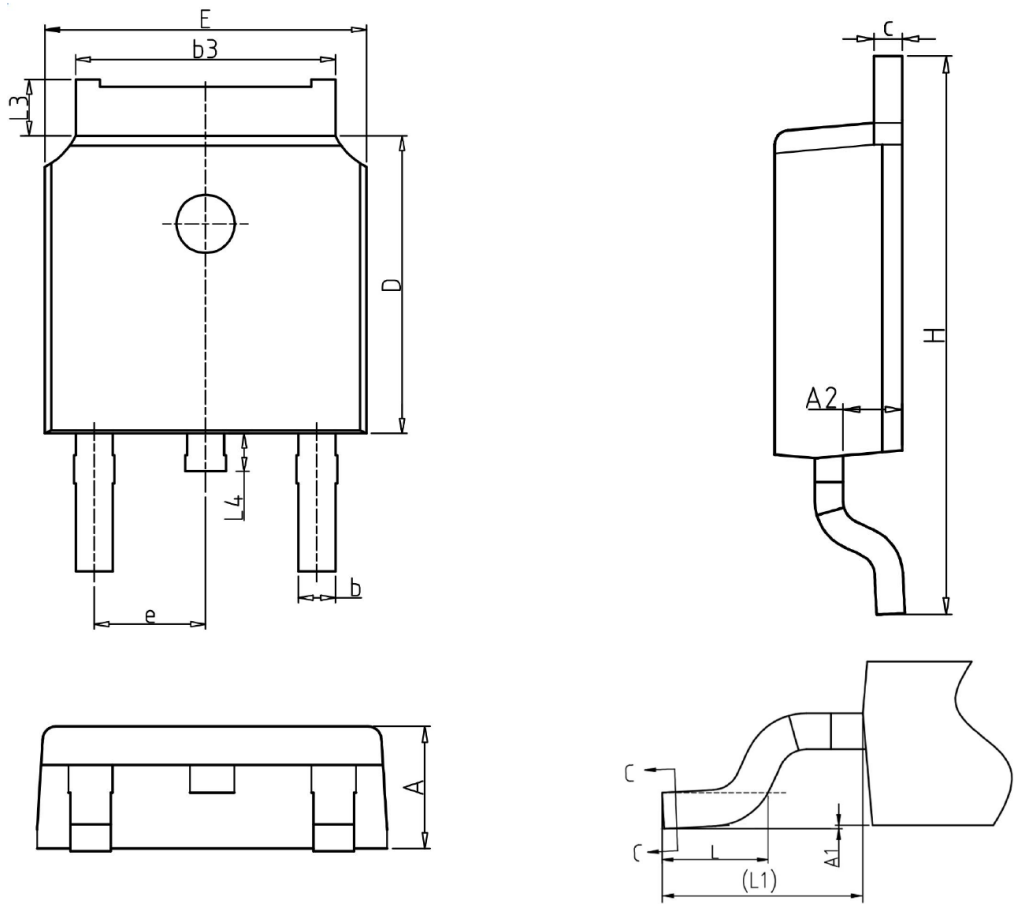
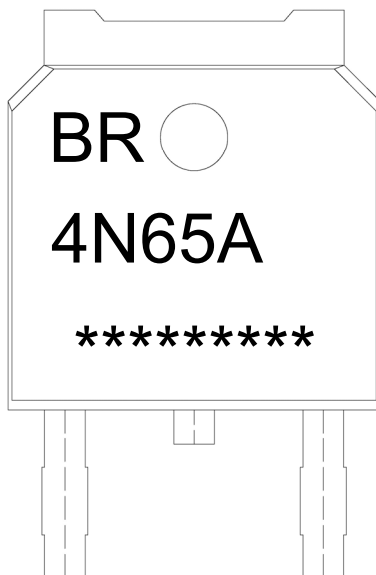


Figure 10. Safe Operation Area

外形尺寸图 / Package Dimensions



Symbol	Dimensions In Millimeters	
	Min	Max
A	2.10	2.50
A1	0.00	0.20
A2	0.90	1.17
b	0.50	0.90
b3	5.10	5.53
c	0.41	0.62
D	5.40	6.40
E	6.30	6.90
e	2.286BSC	
H	9.25	10.50
L	1.38	1.75
L1	2.40	3.40
L3	0.85	1.30
L4	0.50	1.00

**印章说明 / Marking Instructions**

说明：

BR：为公司代码

4N65A：为型号代码

*****：为生产批号代码，随生产批号变化

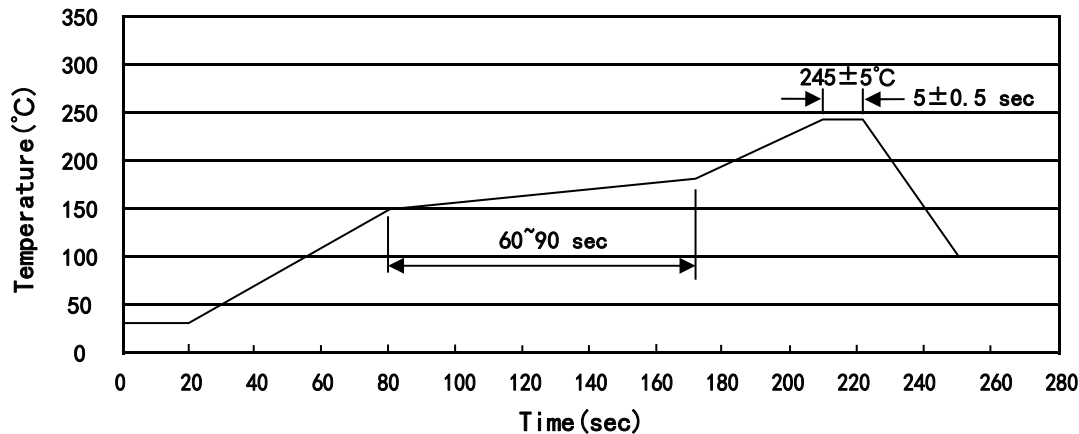
Note:

BR: Company Code

4N65A: 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	6	30,000	13" ×16	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: 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

本文档中提供的所有信息均受法律免责声明的约束。

All information provided in this document is subject to legal disclaimers.