

# BRCS3710LDP

Rev.A Jun.-2021

## 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.

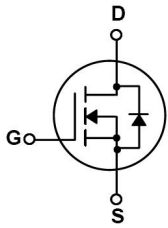
## 特征 / Features

阻抗低，开关速度快。无卤产品。  
Low On-Resistance, fast switching. HF Product.

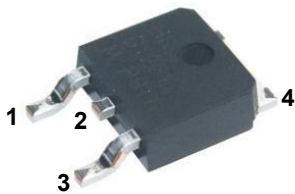
## 用途 / Applications

用于高效 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

## 印章代码 / 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		$V_{DSS}$	100	V
Drain Current		$I_D(T_C=25^\circ\text{C})$	59	A
Pulsed Drain Current		$I_{DM}$	240	A
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Avalanche Current		$I_{AR}$	15	A
Single Pulsed Avalanche Energy		$E_{AS}$	170	mJ
Total Power Dissipation		$P_D(T_C=25^\circ\text{C})$	73	W
Junction and Storage Temperature Range		$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$
Junction-to-Ambient	$t \leq 10\text{s}$	$R_{\theta JA}$	20	$^\circ\text{C/W}$
Junction-to-Ambient	Steady-State		50	
Junction-to-Case	Steady-State	$R_{\theta JC}$	1.7	

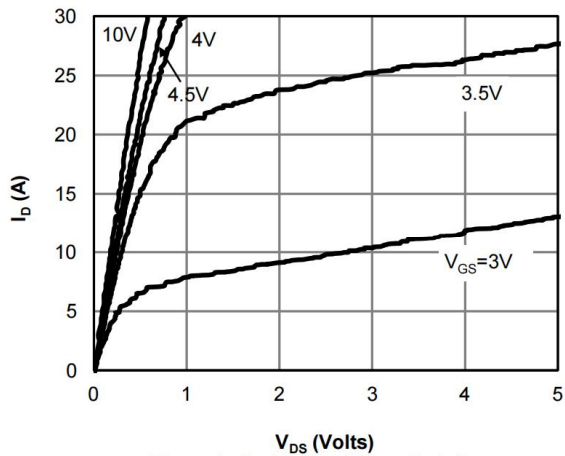
**电性能参数 / Electrical Characteristics(Ta=25°C)**

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	$BV_{DSS}$	$V_{GS}=0\text{V}$ $I_D=250\mu\text{A}$	100	102		V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=100\text{V}$ $V_{GS}=0\text{V}$			1	$\mu\text{A}$
		$V_{DS}=100\text{V}$ $V_{GS}=0\text{V}$ $T_J=125^\circ\text{C}$			5	$\mu\text{A}$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20\text{V}$ $V_{DS}=0\text{V}$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu\text{A}$	1.0	1.5	3.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10\text{V}$ $I_D=35\text{A}$		17.5	20	$\text{m}\Omega$
	$R_{DS(on)}$	$V_{GS}=4.5\text{V}$ $I_D=20\text{A}$		20	25	$\text{m}\Omega$
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0\text{V}$ $I_S=35\text{A}$ $T_J=25^\circ\text{C}$			1.2	V

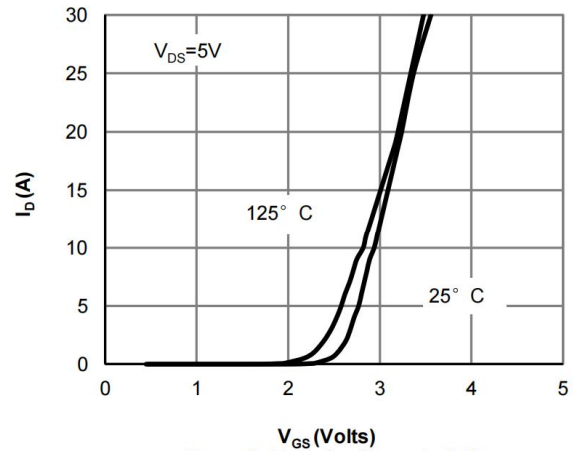
## 电性能参数 / Electrical Characteristics(Ta=25°C)

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
Input Capacitance	$C_{iss}$	$V_{DS}=25V$ $V_{GS}=0V$ $f=1MHz$		4780		pF
Output Capacitance	$C_{oss}$			110		
Reverse Transfer Capacitance	$C_{rss}$			140		
Gate resistance	$R_g$	$V_{GS}=0V,$ $V_{DS}=0V,$ $f=1MHz$		1		$\Omega$
Total Gate Charge	$Q_{g(10V)}$	$V_{GS}=10V,$ $V_{DS}=50V,$ $I_D=20A$		16		nC
Gate Source Charge	$Q_{gs}$			5		
Gate Drain Charge	$Q_{gd}$			3		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V$ $V_{DS}=50V$ $R_L=2.5\Omega$ $R_{GEN}=3\Omega$		7.5		ns
Turn-On Rise Time	$t_r$			2.5		
Turn-Off Delay Time	$t_{d(off)}$			16.5		
Turn-Off Fall Time	$t_f$			3		

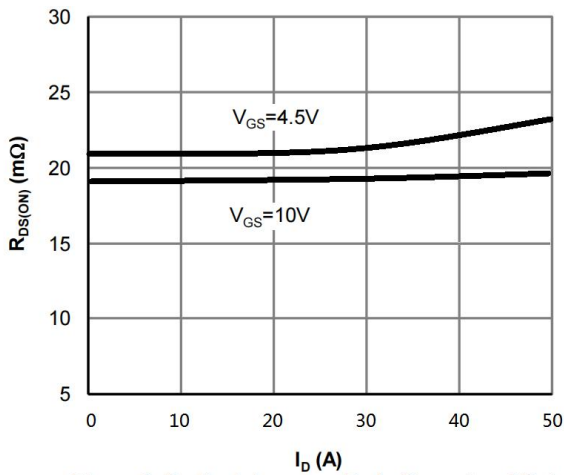
电参数曲线图 / Electrical Characteristic Curve



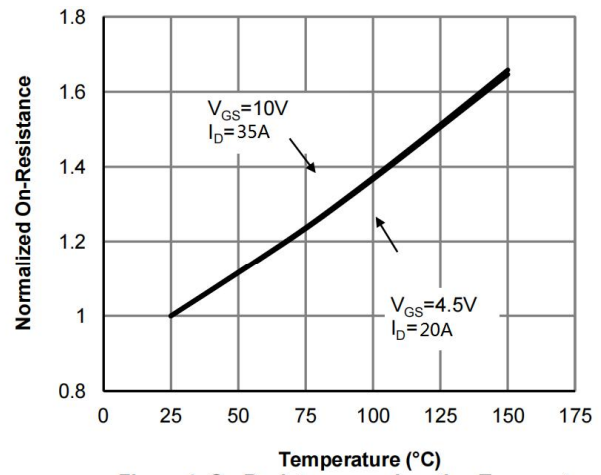
**Figure 1: On-Region Characteristics**



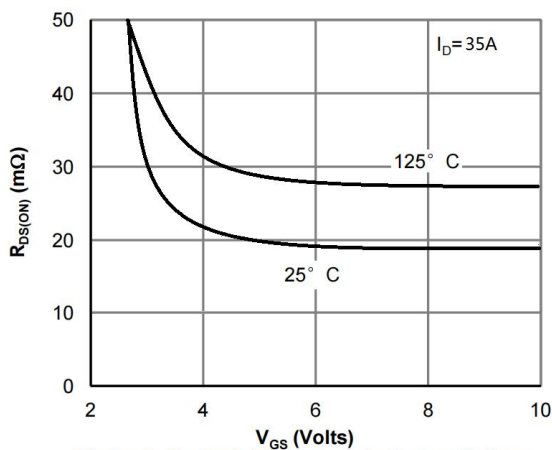
**Figure 2: Transfer Characteristics**



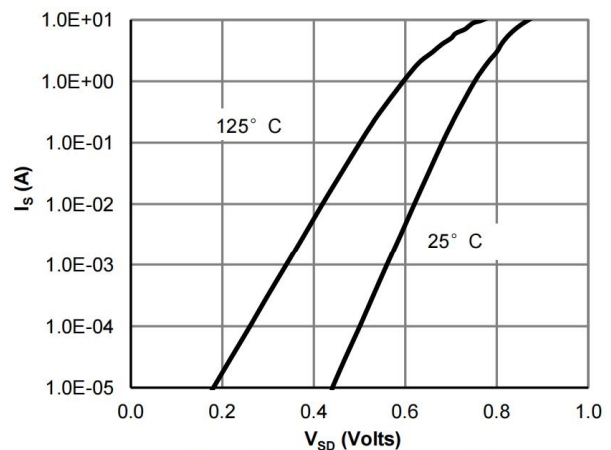
**Figure 3: On-Resistance vs. Drain Current and Gate Voltage**



**Figure 4: On-Resistance vs. Junction Temperature**

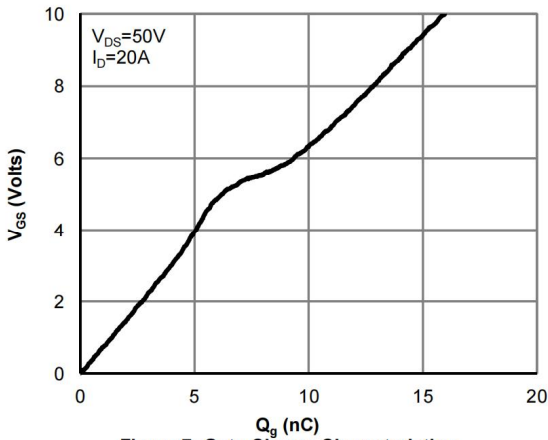


**Figure 5: On-Resistance vs. Gate-Source Voltage**

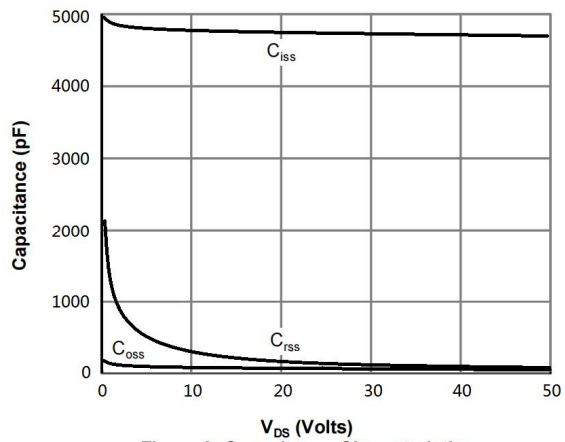


**Figure 6: Body-Diode Characteristics**

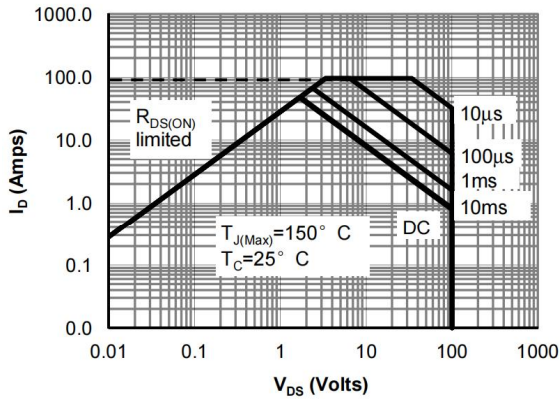
**电参数曲线图 / Electrical Characteristic Curve**



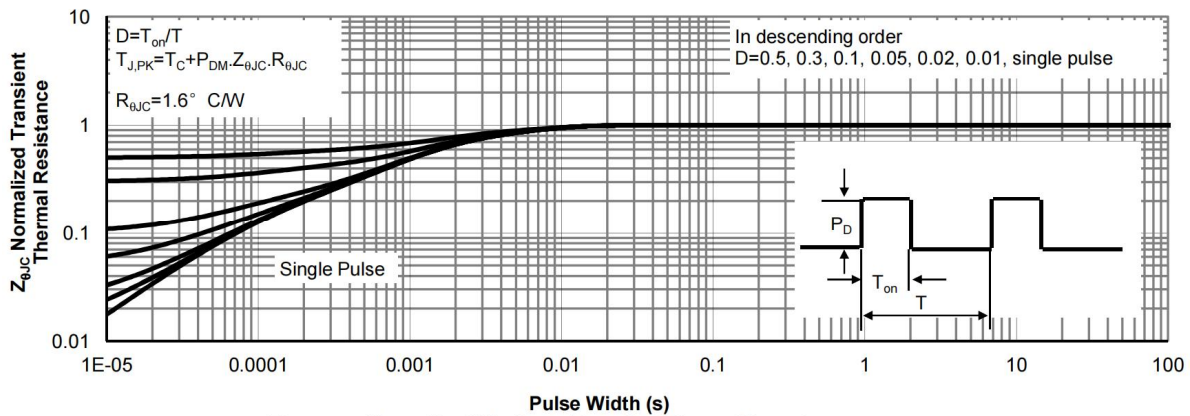
**Figure 7: Gate-Charge Characteristics**



**Figure 8: Capacitance Characteristics**

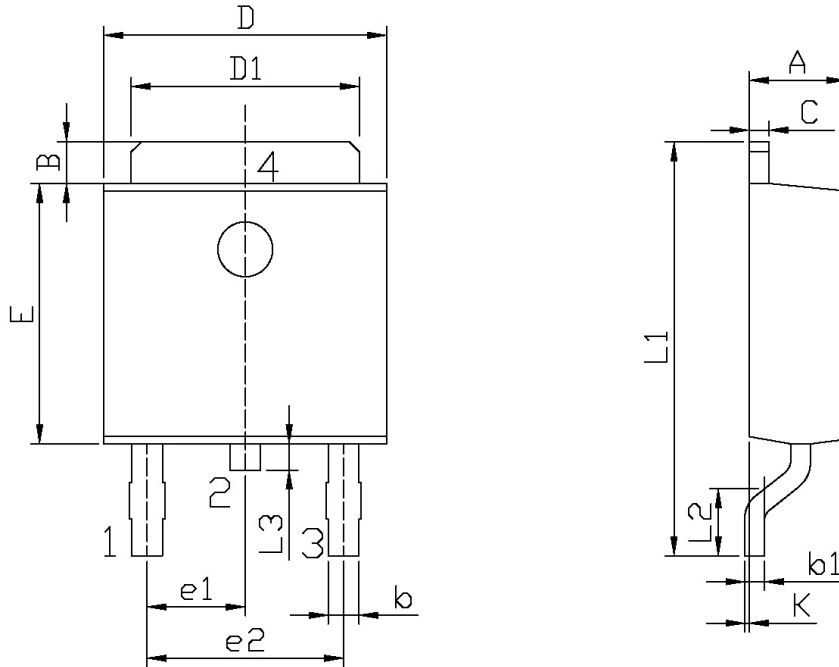


**Figure 9: Maximum Forward Biased Safe Operating Area**



**Figure 10: Normalized Maximum Transient Thermal Impedance**

**外形尺寸图 / Package Dimensions**

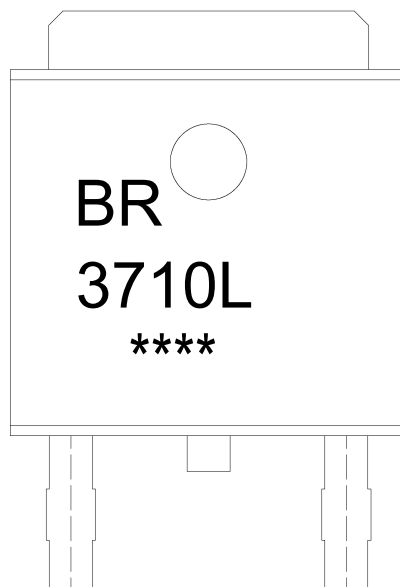


单位: mm

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

TO-252

## 印章说明 / Marking Instructions



说明：

BR： 为公司代码

3710L： 为产品型号

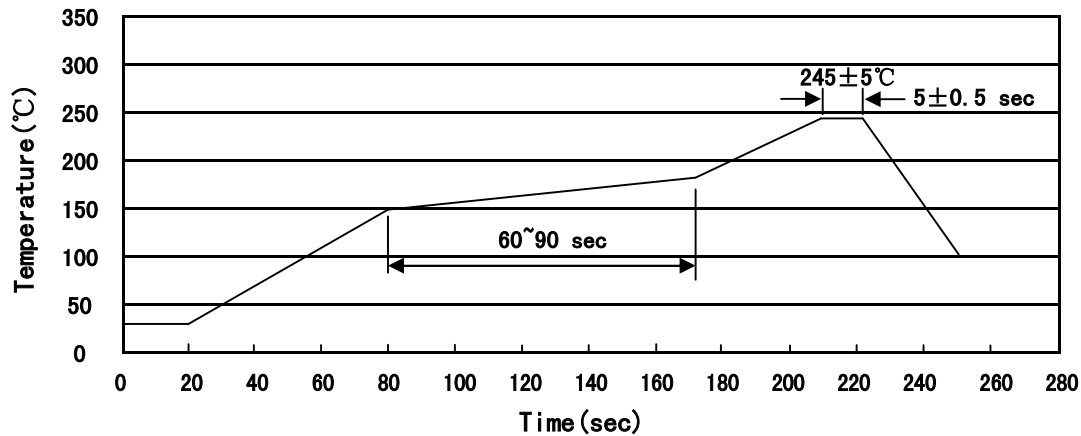
\*\*\*\*： 为生产批号代码，随生产批号变化。

Note:

BR: Company Code

3710L: Product Type.

\*\*\*\*: Lot No. Code, code change with Lot No.

**波峰焊温度曲线图(无铅) / Temperature Profile for Dip 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：270±5°C

时间：10±1 sec.

Temp.:270±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 <sup>3</sup> )		
	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 <sup>3</sup> )		
	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**