

BRD640

Rev.D May.-2016

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

低栅电荷,低反馈电容,开关速度快。

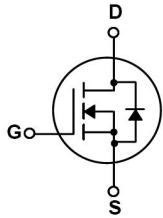
Low gate charge, low crss, fast switching.

用途 / Applications

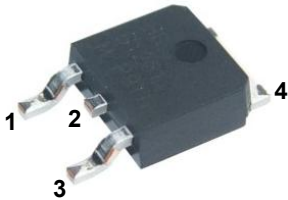
用于高效 DC/DC 转换和功率开关。

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



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°C)

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Drain-Source Voltage	V_{DSS}	200	V
Drain Current	$I_D(T_C=25^{\circ}C)$	18	A
Drain Current	$I_D(T_C=100^{\circ}C)$	11.2	A
Pulsed Drain Current ^{Note1}	I_{DM}	72	A
Gate-Source Voltage	V_{GSS}	±20	V
Single Pulsed Avalanche Energy ^{Note2}	E_{AS}	500	mJ
Repetitive Avalanche Energy	E_{AR}	13.9	mJ
Avalanche Current ^{Note1}	I_{AR}	10	A
Total Power Dissipation	P_D	186	W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C
Junction-to-Case	$R_{\theta JC}$	0.74	°C/W
Junction-to-Ambient	$R_{\theta JA}$	48.19	°C/W

Notes:

1: Repetitive rating; pulse width limited by maximum junction temperature

2: L=10.0mH, $I_D=10A$, Start $T_J=25^{\circ}C$

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
Zero Gate Voltage Drain Current	BV_{DSS}	$V_{GS}=0V$ $I_D=250\mu A$	200			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=200V$ $V_{GS}=0V$			1	μA
		$V_{DS}=160V$ $T_C=125^{\circ}C$			100	μA
Gate-Body Leakage Current Forward	I_{GSS}	$V_{GS}=\pm 20V$ $V_{DS}=0V$			±0.1	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	2.0		4.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=10.8A$		0.14	0.18	Ω
Forward On Voltage	V_{SD}	$V_{GS}=0V$ $I_S=10.8A$			1.5	V
Input Capacitance	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0MHz$		1685		pF
Output Capacitance	C_{oss}			121		pF
Reverse Transfer Capacitance	C_{rss}			6.4		pF
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=100V$ $I_D=18A$ $R_G=10\Omega$ $V_{GS}=10V$		24.5		ns
Turn-On Rise Time	t_r			24		ns
Turn-Off Delay Time	$t_{d(off)}$			49.6		ns
Turn-Off Fall Time	t_f			11.2		ns

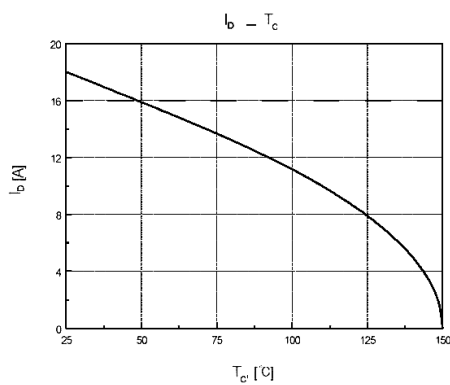
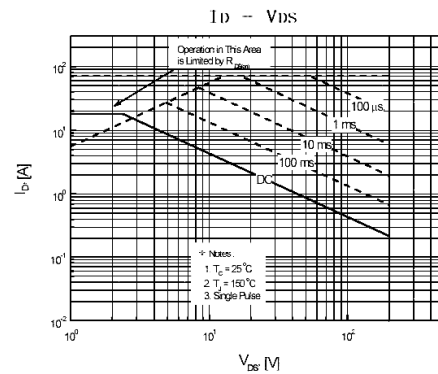
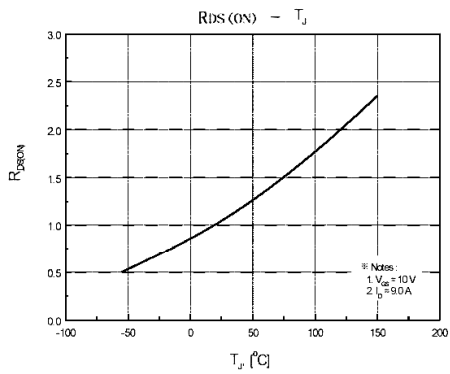
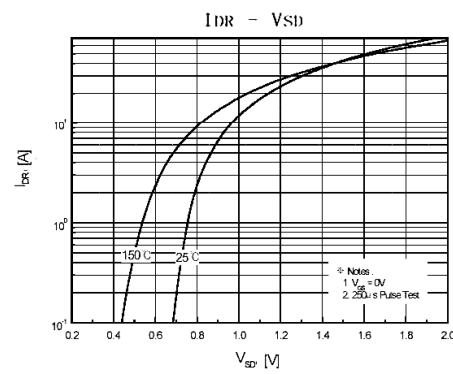
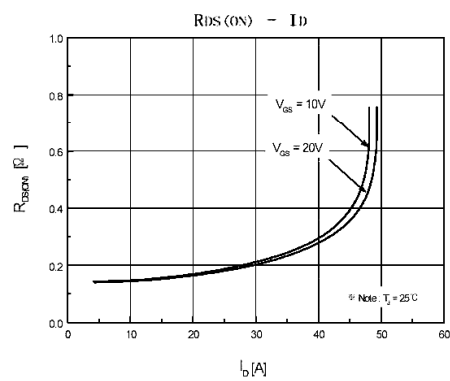
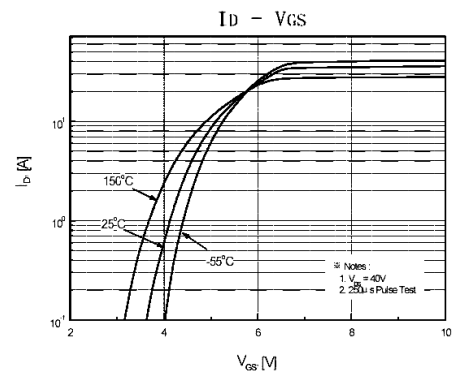
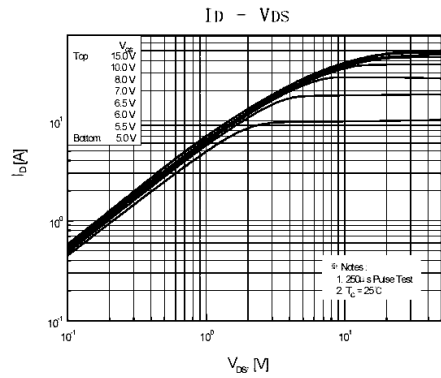
电性能参数 / Electrical Characteristics(Ta=25°C)

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
Total Gate Charge	Q_g	$I_D=18A$ $V_{DD}=160V$ $V_G=10V$		31		nC
Gate to Source Charge	Q_{gs}			8.69		nC
Gate to Drain ("Miller") Charge	Q_{gd}			8.59		nC
Continuous Source Current (Body Diode)	I_S				18	A
Maximum Pulsed Current (Body Diode)	I_{SM}				72	A
Reverse Recovery Time	t_{rr}	$I_S=18A$ $T_j = 25^\circ C$ $di_F/dt=100A/us$ $V_{GS}=0V$		208		ns
Reverse Recovery Charge	Q_{rr}			0.79		nC

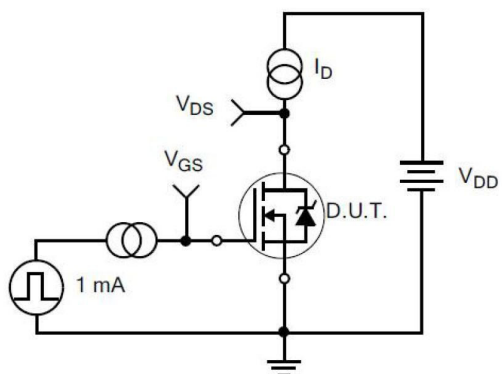
Note:

Pulse width $t_p \leq 300\mu s$, $\delta \leq 2\%$

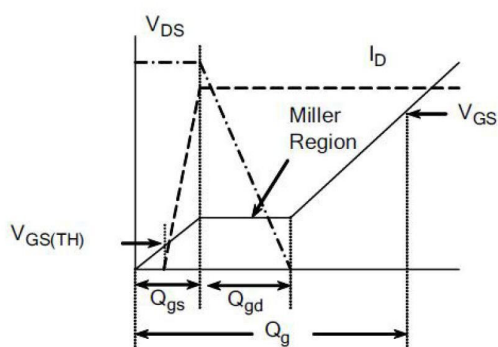
电参数曲线图 / Electrical Characteristic Curve



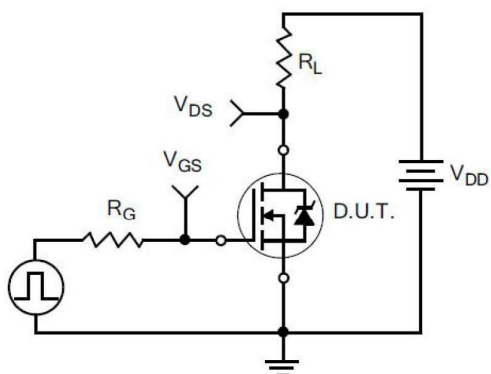
测试电路与波形图 / Test Circuit and Waveform Curve



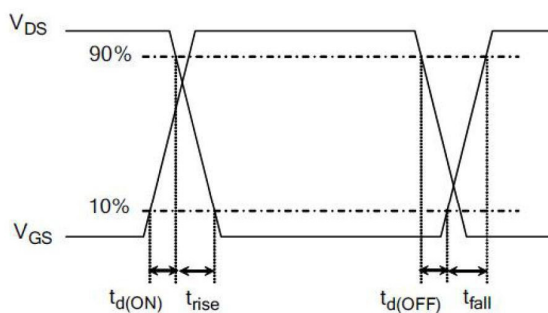
Gate Charge Test Circuit



Gate Charge Waveform

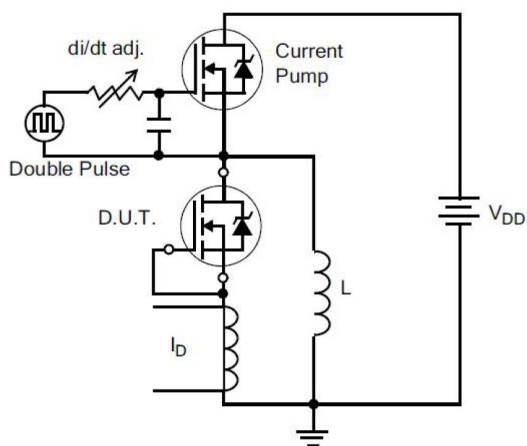


Resistive Switching Test Circuit

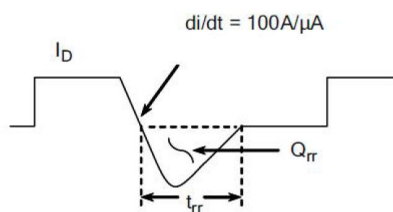


Resistive Switching Waveforms

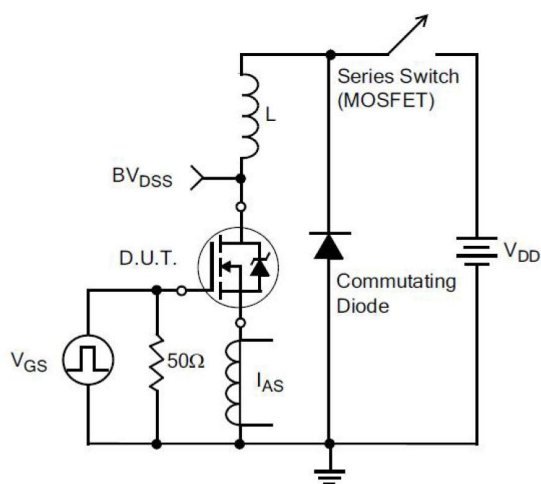
测试电路与波形图 / Test Circuit and Waveform Curve



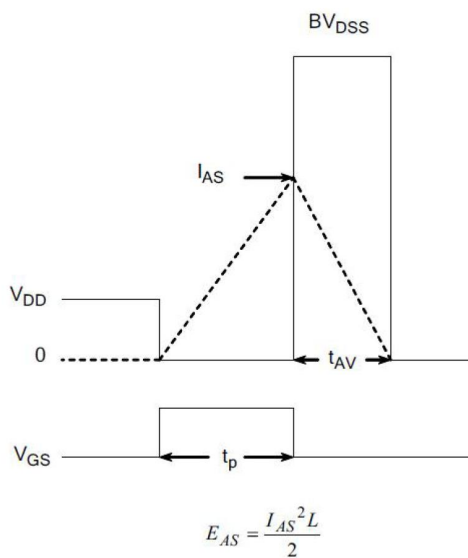
Diode Reverse Recovery Test Circuit



Diode Reverse Recovery Waveform

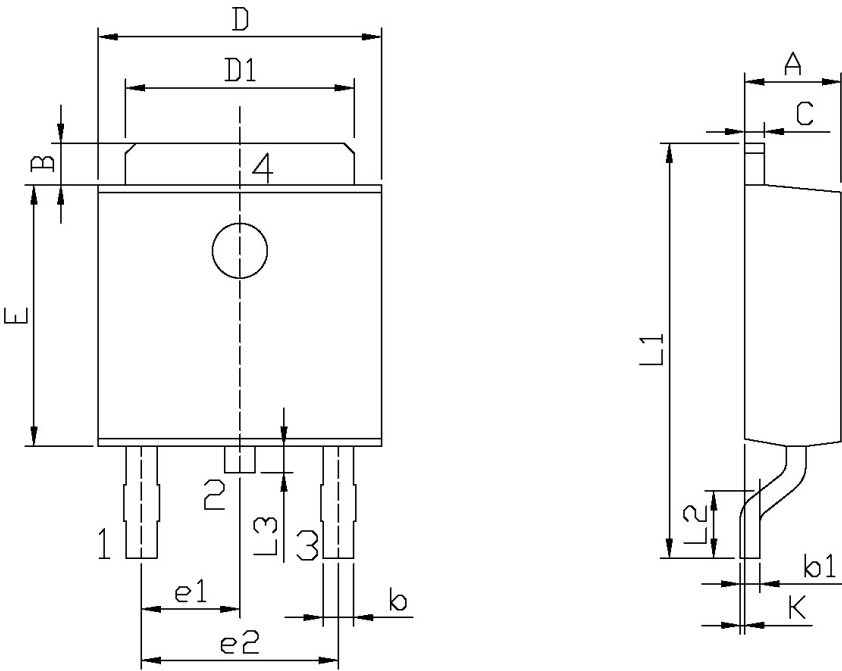


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

外形尺寸图 / Package Dimensions

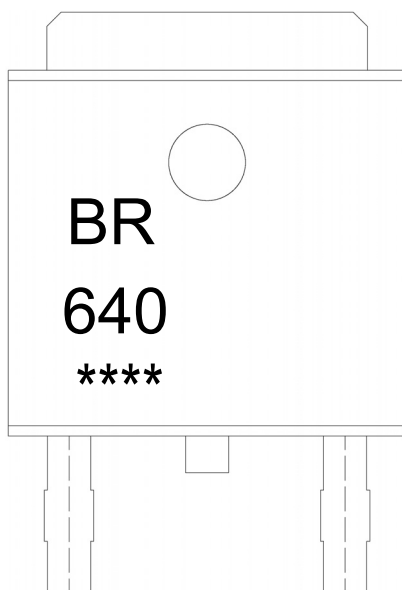


单位: mm

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

TQ-252

印章说明 / Marking Instructions



说明：

BR： 为公司代码

640： 为型号代码

****： 为生产批号代码，随生产批号变化。

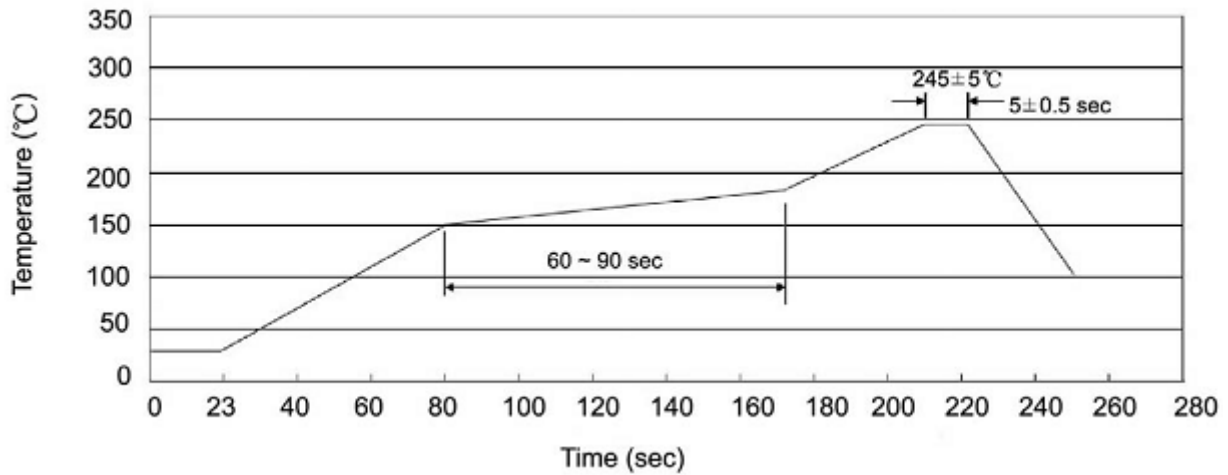
Note:

BR: Company Code

640: 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 25 ~ 150°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:25~150°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