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FCI25N60N

N 沟道 SupreMOS® MOSFET

600 V, 25 A, 125 mΩ

特性

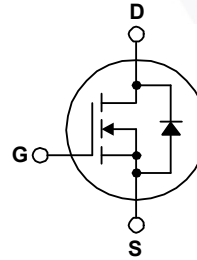
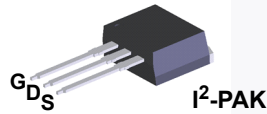
- $R_{DS(on)} = 107 \text{ m}\Omega$ (Typ.) @ $V_{GS} = 10 \text{ V}$, $I_D = 12.5 \text{ A}$
- 超低栅极电荷 (典型值 $Q_g = 57 \text{ nC}$)
- 低有效输出电容 (典型值 $C_{oss(eff.)} = 262 \text{ pF}$)
- 100% 经过雪崩测试
- 符合 RoHS 标准

应用

- 太阳能逆变器
- AC-DC 电源

说明

SupreMOS® MOSFET 是飞兆半导体的下一代高压超级结 (SJ) 技术, 该技术采用区别于传统 SJ MOSFET 产品的深沟槽填充工艺。这项先进技术和精密的工艺控制提供了最低的 R_{sp} on-resistance (导通电阻规格), 卓越的开关性能和耐用性。SupreMOS MOSFET 产品非常适合高频开关电源转换器应用, 如功率因数校正 (PFC)、服务器 / 电信电源、平板电视电源、ATX 电源及工业电源应用。



MOSFET 最大额定值 $T_C = 25^\circ\text{C}$ 除非另有说明。

符号	参数	FCI25N60N_F102	单位
V_{DSS}	漏极-源极电压	600	V
V_{GSS}	栅极-源极电压	± 30	V
I_D	漏极电流	- 连续 ($T_C = 25^\circ\text{C}$)	25
		- 连续 ($T_C = 100^\circ\text{C}$)	16
I_{DM}	漏极电流	- 脉冲 (说明 1)	75
E_{AS}	单脉冲雪崩能量	(说明 2)	861
I_{AR}	雪崩电流	(说明 1)	8.3
E_{AR}	重复雪崩能量	(说明 1)	2.2
dv/dt	MOSFET dv/dt	100	V/ns
	二极管恢复 dv/dt 峰值	(说明 3)	
P_D	功耗	($T_C = 25^\circ\text{C}$)	216
		- 降低至 25°C 以上	1.72
T_J, T_{STG}	工作和存储温度范围	-55 至 +150	$^\circ\text{C}$
T_L	用于焊接的最大引线温度, 距离外壳 1/8", 持续 5 秒	300	$^\circ\text{C}$

热性能

符号	参数	FCI25N60N_F102	单位
$R_{\theta JC}$	结至外壳热阻最大值	0.58	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	结至环境热阻最大值	62.5	

封装标识与订购信息

器件编号	顶标	封装	包装方法	卷尺寸	带宽	数量
FCI25N60N_F102	FCI25N60N	I ² -PAK	塑料管	不适用	不适用	50 个

电气特性 $T_C = 25^\circ\text{C}$ 除非另有说明。

符号	参数	测试条件	最小值	典型值	最大值	单位
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关断特性

BV_{DSS}	漏极-源极击穿电压	$I_D = 1\text{ mA}, V_{GS} = 0\text{ V}, T_J = 25^\circ\text{C}$	600	-	-	V
$\Delta BV_{DSS} / \Delta T_J$	击穿电压温度系数	$I_D = 1\text{ mA}$, 参考温度为 25°C	-	0.74	-	V/ $^\circ\text{C}$
I_{DSS}	零栅极电压漏极电流	$V_{DS} = 480\text{ V}, V_{GS} = 0\text{ V}$ $V_{DS} = 480\text{ V}, T_J = 125^\circ\text{C}$	-	-	10 100	μA
I_{GSS}	栅极-体漏电流	$V_{GS} = \pm 30\text{ V}, V_{DS} = 0\text{ V}$	-	-	± 100	nA

导通特性

$V_{GS(th)}$	栅极阈值电压	$V_{GS} = V_{DS}, I_D = 250\ \mu\text{A}$	2.0	-	4.0	V
$R_{DS(on)}$	漏极至源极静态导通电阻	$V_{GS} = 10\text{ V}, I_D = 12.5\text{ A}$	-	0.107	0.125	Ω
g_{FS}	正向跨导	$V_{DS} = 20\text{ V}, I_D = 12.5\text{ A}$	-	-	-	S

动态特性

C_{iss}	输入电容	$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V},$ $f = 1\text{ MHz}$	-	2520	3352	pF
C_{oss}	输出电容		-	103	137	pF
C_{rss}	反向传输电容		-	3.2	5	pF
C_{oss}	输出电容	$V_{DS} = 380\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	-	55	-	pF
$C_{oss(eff.)}$	有效输出电容	$V_{DS} = 0\text{ V}$ 至 $480\text{ V}, V_{GS} = 0\text{ V}$	-	262	-	pF
$Q_{g(tot)}$	10 V 的栅极电荷总量	$V_{DS} = 380\text{ V}, I_D = 12.5\text{ A},$ $V_{GS} = 10\text{ V}$ (说明 4)	-	57	74	nC
Q_{gs}	栅极-源极栅极电荷		-	10	-	nC
Q_{gd}	栅极-漏极“米勒”电荷		-	18	-	nC
ESR	等效串联电阻 (G-S)	$f = 1\text{ MHz}$	-	1	-	Ω

开关特性

$t_{d(on)}$	导通延迟时间	$V_{DD} = 380\text{ V}, I_D = 12.5\text{ A},$ $V_{GS} = 10\text{ V}, R_G = 4.7\ \Omega$ (说明 4)	-	21	52	ns
t_r	开通上升时间		-	22	54	ns
$t_{d(off)}$	关断延迟时间		-	68	146	ns
t_f	关断下降时间		-	5	20	ns

漏极-源极二极管特性

I_S	漏极-源极二极管最大正向连续电流	-	-	25	A	
I_{SM}	漏极-源极二极管最大正向脉冲电流	-	-	75	A	
V_{SD}	漏极-源极二极管正向电压	$V_{GS} = 0\text{ V}, I_{SD} = 12.5\text{ A}$	-	-	1.2	V
t_{rr}	反向恢复时间	$V_{GS} = 0\text{ V}, I_{SD} = 12.5\text{ A},$ $di_F/dt = 100\text{ A}/\mu\text{s}$	-	370	-	ns
Q_{rr}	反向恢复电荷		-	7	-	μC

注意:

- 重复额定值: 脉冲宽度受限于最大结温。
- $I_{AS} = 8.3\text{ A}$, $R_G = 25\ \Omega$, 启动 $T_J = 25^\circ\text{C}$ 。
- $I_{SD} \leq 25\text{ A}$, $di/dt \leq 200\text{ A}/\mu\text{s}$, $V_{DD} \leq 380\text{ V}$, 启动 $T_J = 25^\circ\text{C}$ 。
- 本质上独立于工作温度的典型特性。

典型性能特征

图 1. 导通区域特性

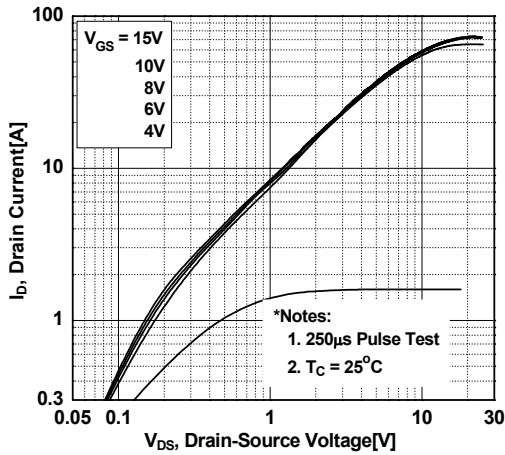


图 2. 传输特性

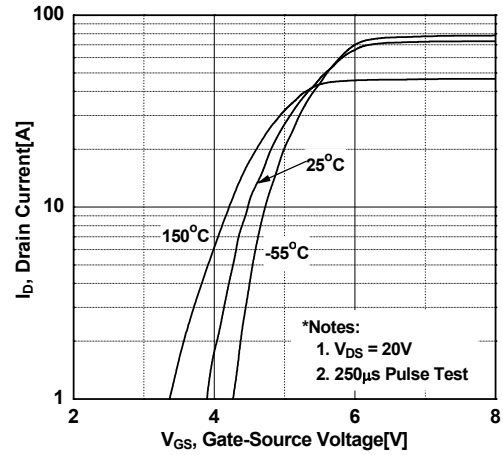


图 3. 导通电阻变化与漏极电流和栅极电压

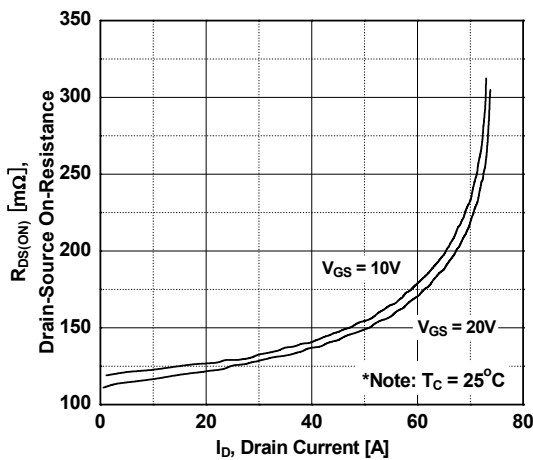


图 4. 体二极管正向电压变化与源极电流和温度

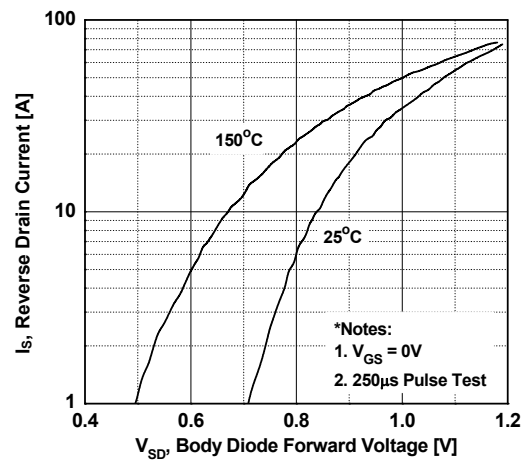


图 5. 电容特性

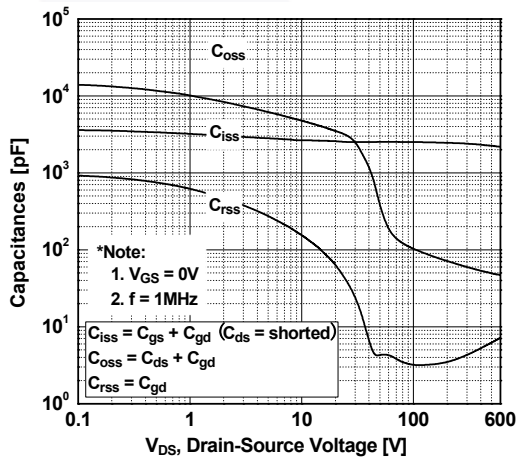
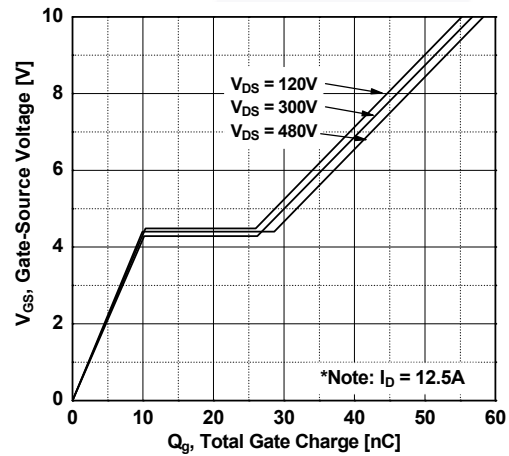


图 6. 栅极电荷特性



典型性能特征 (接上页)

图 7. 击穿电压变化与温度

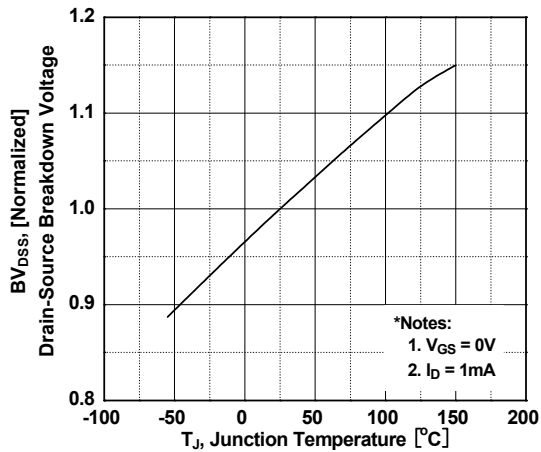


图 8. 导通电阻变化与温度

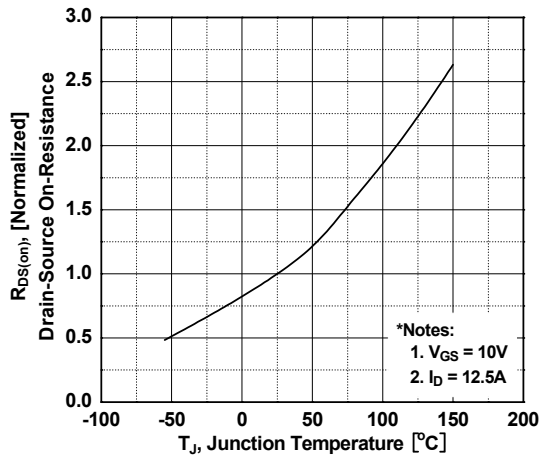


图 9. 最大安全工作区

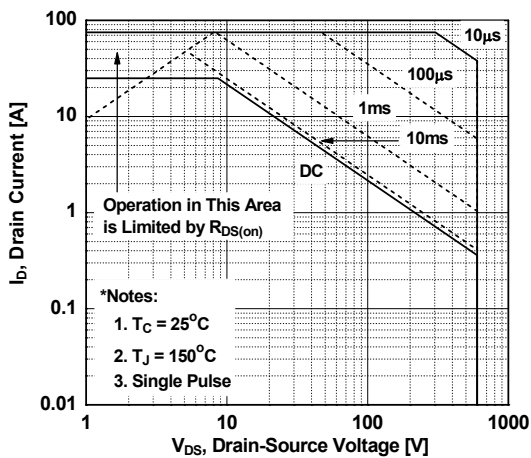


图 10. 最大漏极电流与外壳温度

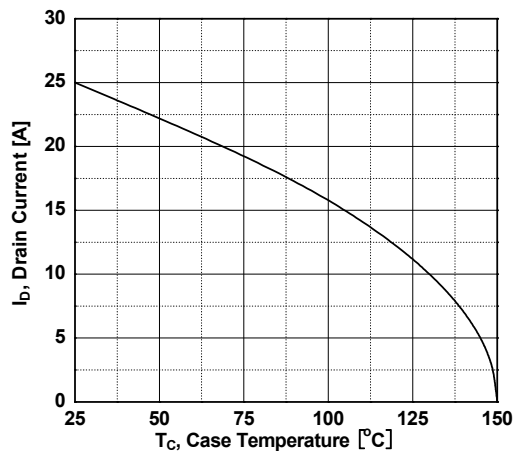
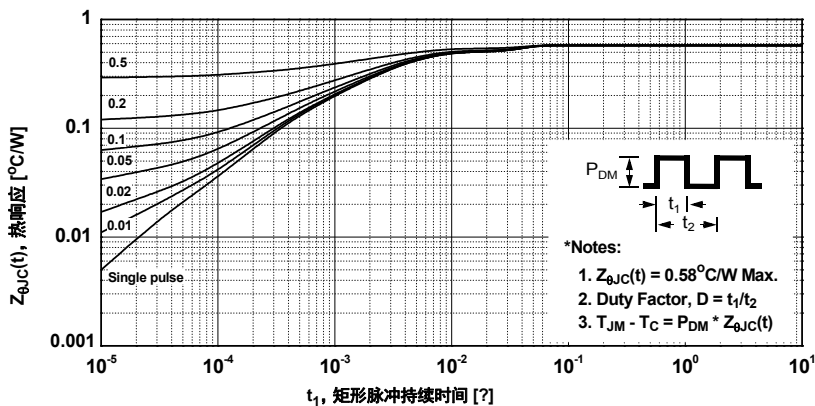


图 11. 瞬态热响应曲线



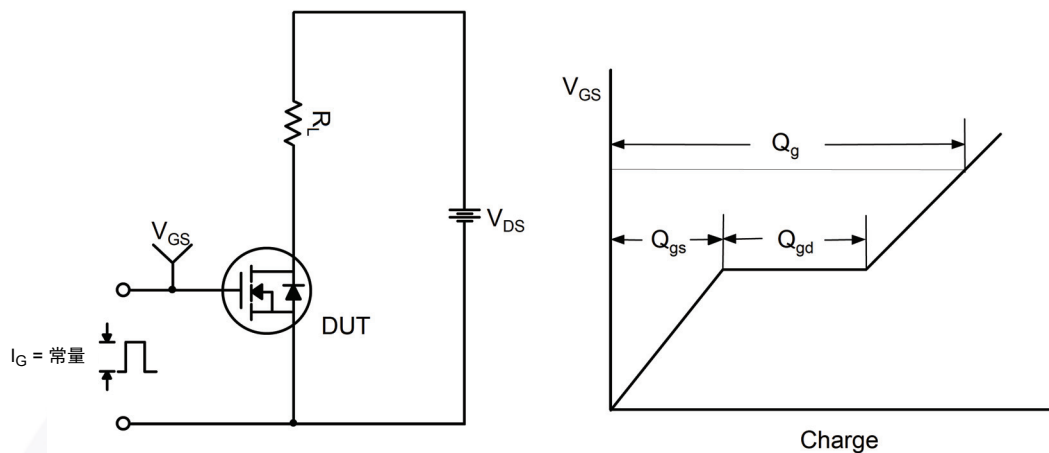


图 12. 栅极电荷测试电路与波形

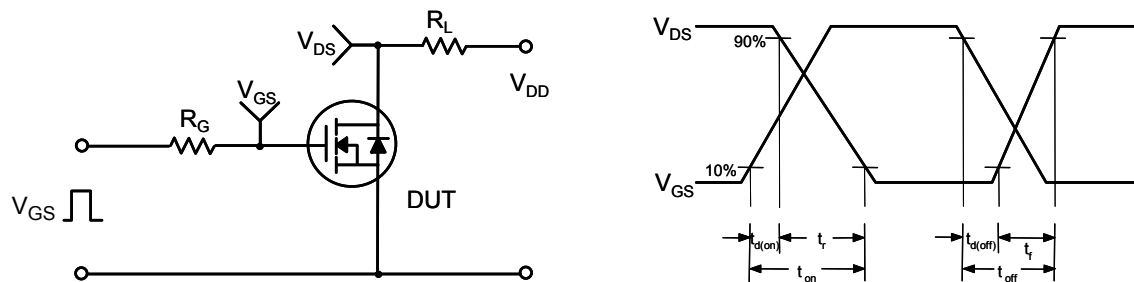


图 13. 阻性开关测试电路与波形

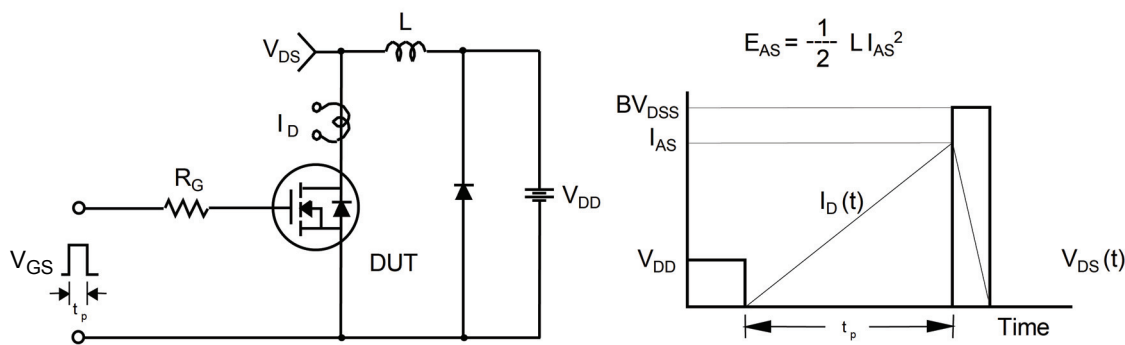


图 14. 非箝位感性开关测试电路与波形

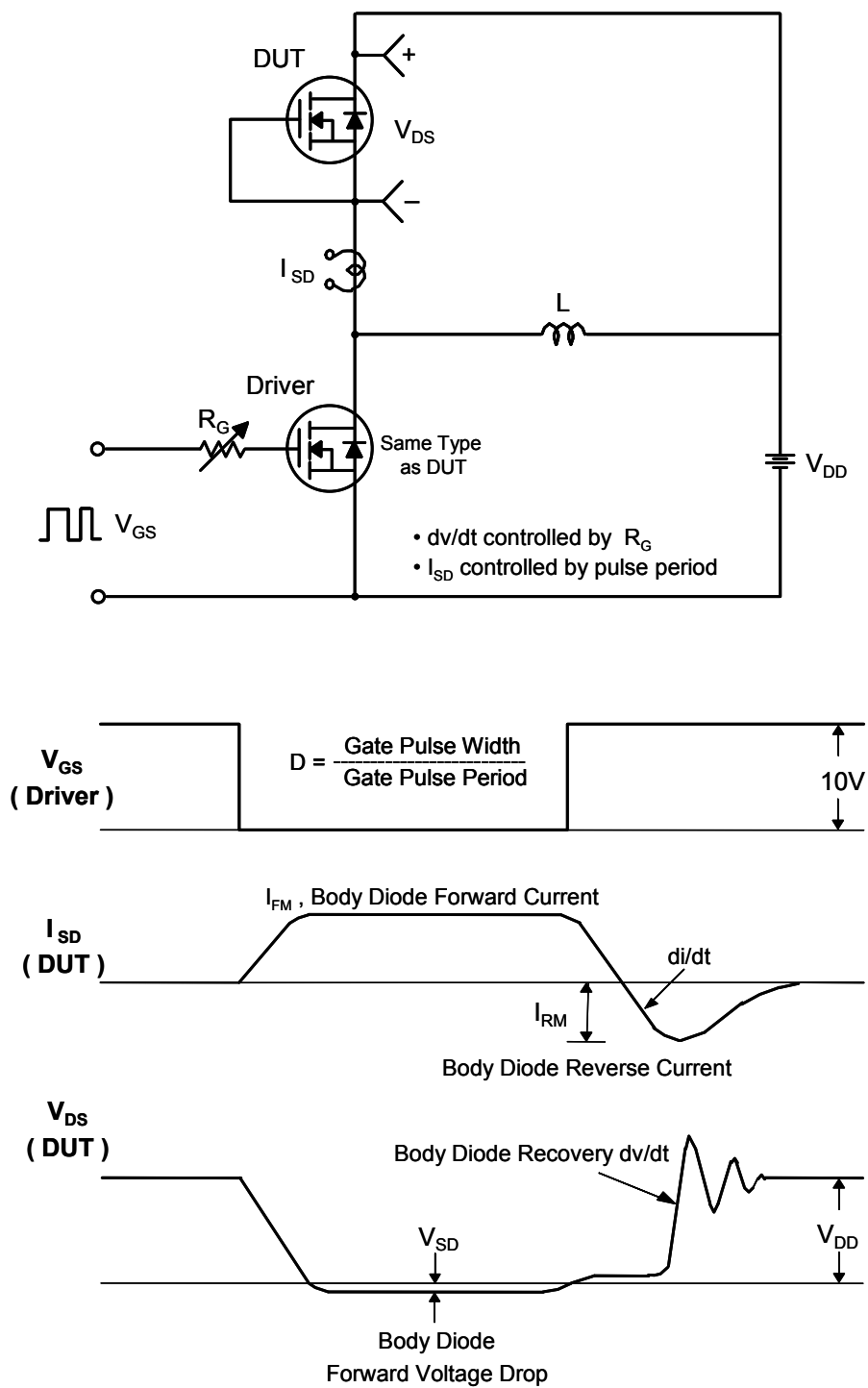
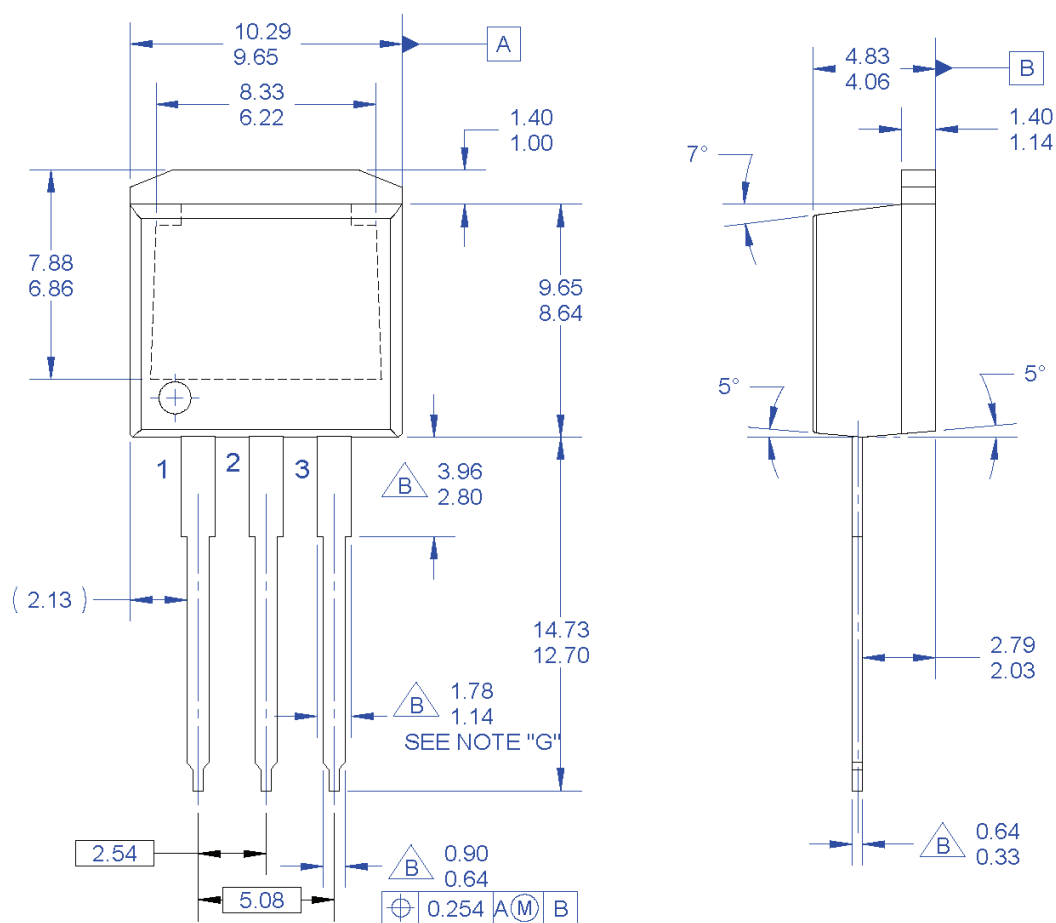


图 15. 峰值二极管恢复 dv/dt 测试电路与波形

机械尺寸



NOTES:

- A. EXCEPT WHERE NOTED CONFORMS TO TO262 JEDEC VARIATION AA.
- △ B. DOES NOT COMPLY JEDEC STD. VALUE.
- C. ALL DIMENSIONS ARE IN MILLIMETERS.
- D. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUSIONS.
- E. DIMENSION AND TOLERANCE AS PER ANSI Y14.5-1994.
- F. LOCATION OF PIN HOLE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF PACKAGE)
- G. MAXIMUM WIDTH FOR F102 DEVICE = 1.35 MAX.
- H. DRAWING FILE NAME: TO262A03REV5

图 16. TO262 (I²PAK), 模塑, 3 引脚, Jedec 变体 AA

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