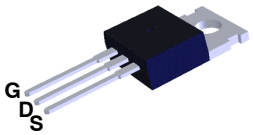
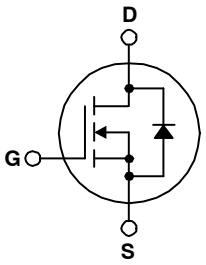
MOSFET – N 沟道 POWERTRENCH®

100 V, 75 A, 9 mΩ

FDP090N10



TO−220−3LD
CASE 340AT



说明

此 N 沟道 MOSFET 采用安森美 (**onsemi**) 先进的 POWERTRENCH 工艺生产，这一先进工艺是专为最大限度地降低导通电阻并保持卓越开关性能而定制的。

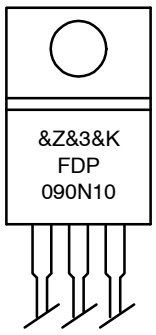
特性

- $R_{DS(on)}$ = 7.2 mΩ (Typ) @ V_{GS} = 10 V, I_D = 75 A
- 快速开关速度
- 低栅极电荷
- 高性能沟道技术可实现极低的 $R_{DS(on)}$
- 高功率和高电流处理能力
- 符合 RoHS 标准

应用

- 用于 ATX/ 服务器/ 通信 PSU 的同步整流
- 电池保护电路
- 电机驱动和不间断电源
- 微型光伏逆变器

MARKING DIAGRAM



&Z	= Assembly Plant Code
&3	= 3−Digit Date Code
&K	= 2−Digit Lot Run Traceability Code
FDP090N10	= Specific Device Code

ORDERING INFORMATION

See detailed ordering and shipping information on page 7 of this data sheet.

MOSFET 最大额定值 (T_C = 25°C 除非另有说明。)

符号	参数		FDP090N10	单位
V_{DSS}	漏极－源极电压		100	V
V_{GSS}	栅极－源极电压		±20	V
I_D	漏极电流	– 连续 T_C = 85°C	75	A
I_{DM}	漏极电流	– 脉冲 (说明 1)	300	
E_{AS}	单脉冲雪崩能量 (说明 2)		309	mJ
I_{AR}	雪崩电流 (说明 1)		75	A
E_{AR}	重复雪崩能量 (说明 1)		20.8	mJ
dv/dt	峰值二极管恢复 dv/dt (说明 3)		5.6	V/ns
P_D	功耗	(T_C = 25°C) – 降额 25°C 以上	208 1.39	W W/°C
T_J, T_{STG}	工作和存储温度范围		–55 至 +175	°C
T_L	用于焊接的最大引脚温度，距离外壳 1/8”，持续 5 秒		300	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.
(参考译文)
如果电压超过最大额定值表中列出的值范围，器件可能会损坏。如果超过任何这些限值，将无法保证器件功能，可能会导致器件损坏，影响可靠性。

热性能

符号	参数	FDP090N10	单位
$R_{\theta JC}$	结至外壳热阻最大值	0.72	°C/W
$R_{\theta JA}$	结至环境热阻最大值	62.5	

NOTES:

电气特性 (T_C = 25°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
关断特性						
BV_{DSS}	漏极－源极击穿电压	I_D = 250 μA, V_{GS} = 0 V, T_C = 25°C	100	–	–	V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	击穿电压温度系数	I_D = 250 μA, 参考条件是 25°C	–	0.1	–	V/°C
I_{DSS}	零栅极电压漏极电流	V_{DS} = 100 V, V_{GS} = 0 V	–	–	1	μA
		V_{DS} = 100 V, V_{GS} = 0 V, T_C = 150°C	–	–	500	
I_{GSS}	栅极– 体漏电流	V_{GS} = ±20 V, V_{DS} = 0 V	–	–	±100	nA
导通特性						
$V_{GS(th)}$	栅极阈值电压	V_{GS} = V_{DS}, I_D = 250 μA	2.5	3.5	4.5	V
$R_{DS(on)}$	漏极至源极静态导通电阻	V_{GS} = 10 V, I_D = 75 A	–	7.2	9	mΩ
g_{FS}	正向跨导	V_{DS} = 10 V, I_D = 37.5 A	–	100	–	S
动态特性						
C_{iss}	输入电容	V_{DS} = 25 V, V_{GS} = 0 V, f = 1 MHz	–	6185	8225	pF
C_{oss}	输出电容		–	585	775	pF
C_{rss}	反向传输电容		–	235	355	pF

电气特性 (T_C = 25°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
开关特性						
$t_{d(on)}$	导通延迟时间	V_{DD} = 50 V, I_D = 75 A, V_{GS} = 10 V, R_{GEN} = 25 Ω (说明 4)	–	107	224	ns
t_r	开通上升时间		–	322	655	ns
$t_{d(off)}$	关断延迟时间		–	166	342	ns
t_f	关断下降时间		–	149	309	ns
$Q_{g(tot)}$	10 V 的栅极电荷总量	V_{DS} = 50 V, I_D = 75 A , V_{GS} = 10 V (说明 4)	–	89	116	nC
Q_{gs}	栅极−源极栅极电荷		–	37	–	nC
Q_{gd}	栅漏极“米勒”电荷		–	22	–	nC
漏源极二极管特性						
I_S	漏源极二极管最大正向连续电流		–	–	75	A
I_{SM}	漏源极二极管最大正向脉冲电流		–	–	300	A
V_{SD}	漏源极二极管正向电压	V_{GS} = 0 V, I_{SD} = 75 A	–	–	1.25	V
t_{rr}	反向恢复时间	V_{GS} = 0 V, I_{SD} = 75 A, dI_F/dt = 100 A/μs	–	73	–	ns
Q_{rr}	反向恢复电荷		–	166	–	nC

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
(参考译文)
除非另有说明，“电气特性”表格中列出的是所列测试条件下的产品性能参数。如果在不同条件下运行，产品性能可能与“电气特性”表格中所列性能参数不一致。

NOTES:

1. 重复额定值：脉冲宽度受限于最大结温。
2. L = 0.11 mH, I_{AS} = 75 A, V_{DD} = 50 V, R_G = 25 Ω, 启动 T_J = 25°C.
3. I_{SD} ≤ 75 A, di/dt ≤ 200 A/μs, V_{DD} ≤ BV_{DSS}, 开始 T_J = 25°C.
4. 本质上独立于工作温度的典型特性。

典型性能特征

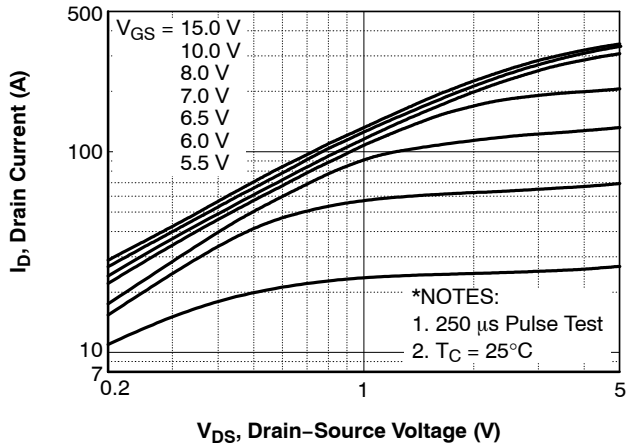


图 1. 导通区域特性

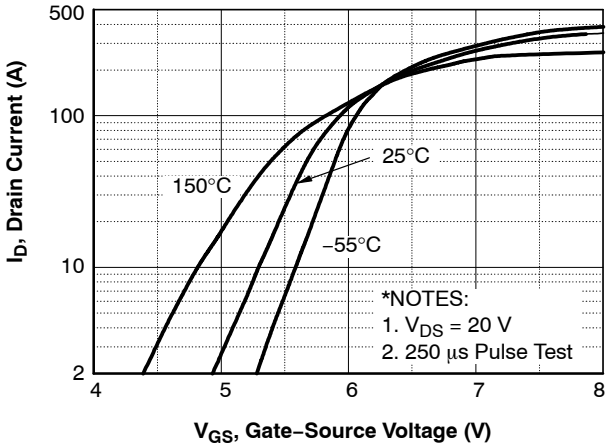


图 2. 传输特性

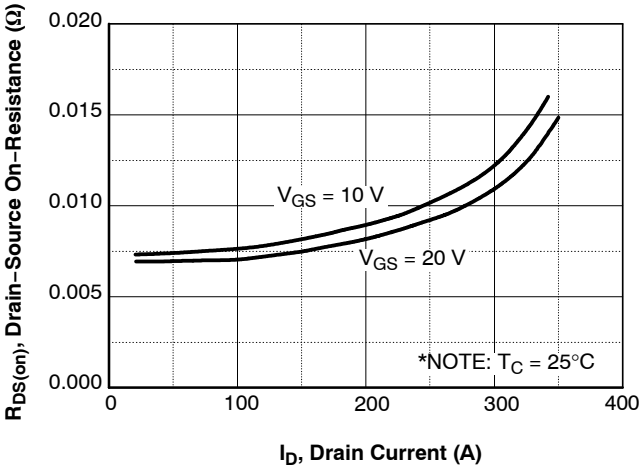


图 3. 导通电阻变化与漏极电流和栅极电压的关系

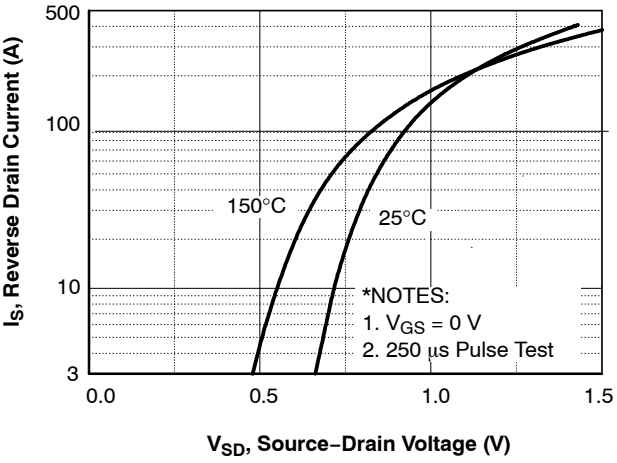


图 4. 体二极管正向电压变化与源极电流的关系的关系和温度

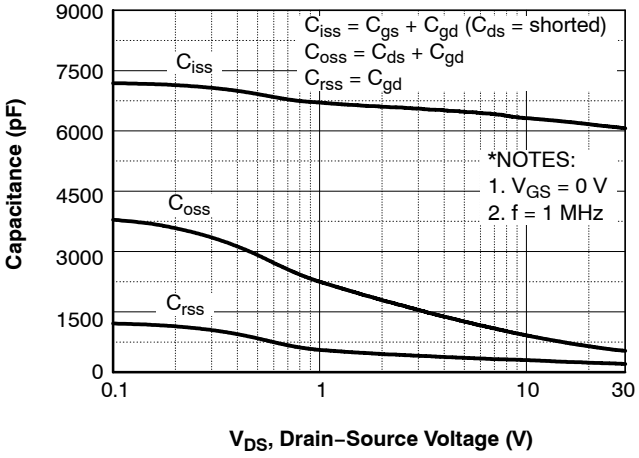


图 5. 电容特性

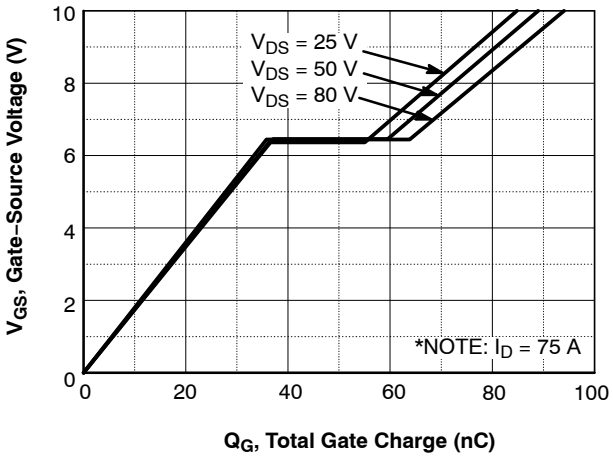


图 6. 栅极电荷特性

典型性能特征 (接上页)

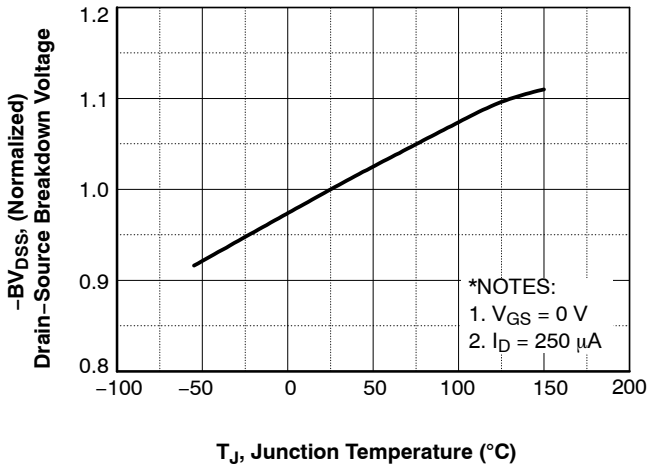


图 7. 击穿电压变化图与温度的关系

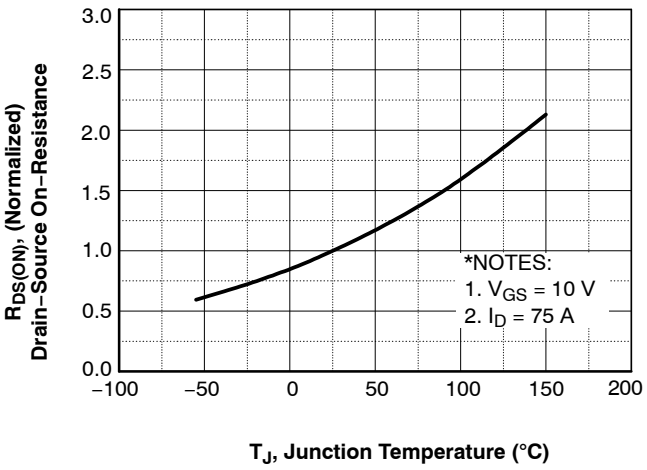


图 8. 导通电阻变化与温度的关系

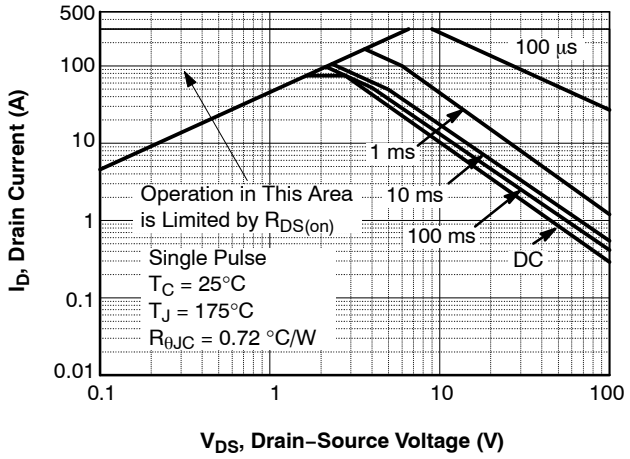


图 9. 最大安全工作区

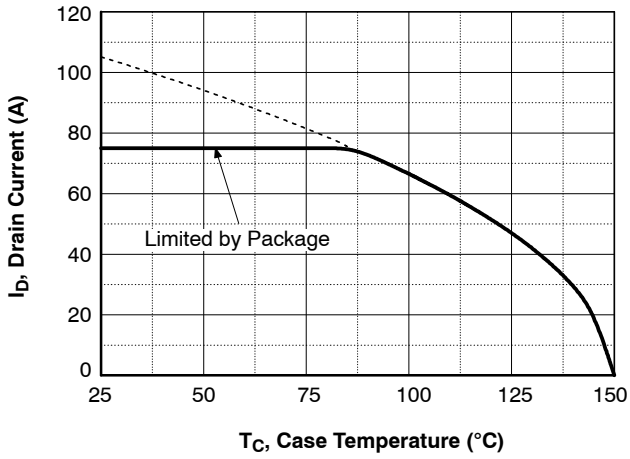


图 10. 最大漏极电流与壳体温度的关系

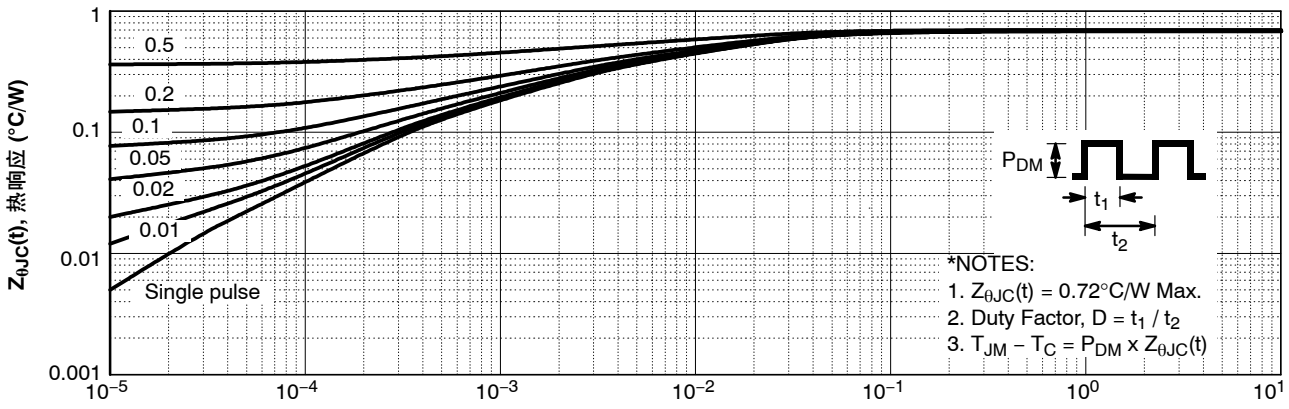


图 11. 瞬态热响应曲线

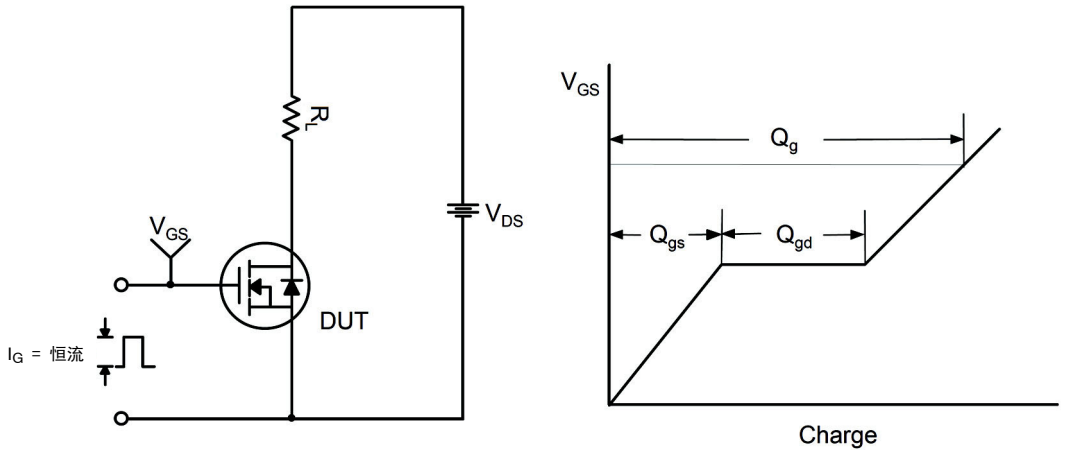


图 12. 栅极电荷测试电路与波形

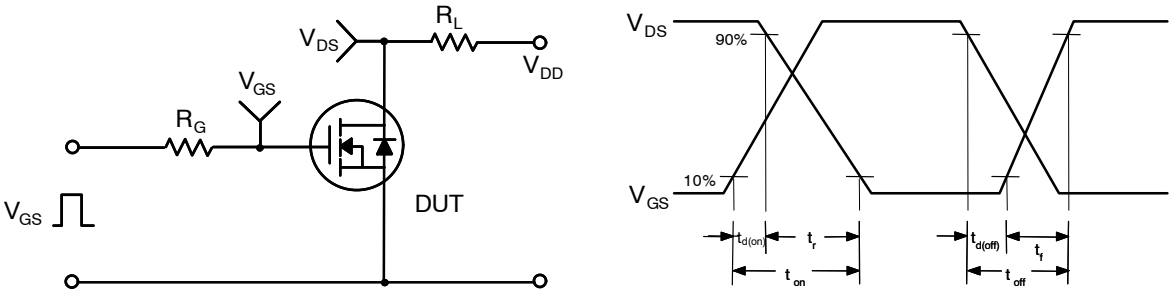


图 13. 阻性开关测试电路与波形

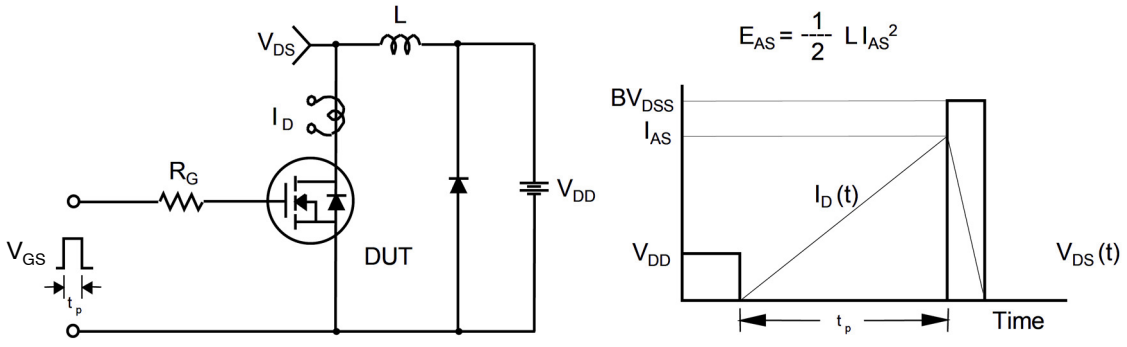


图 14. 非箝位感性开关测试电路与波形

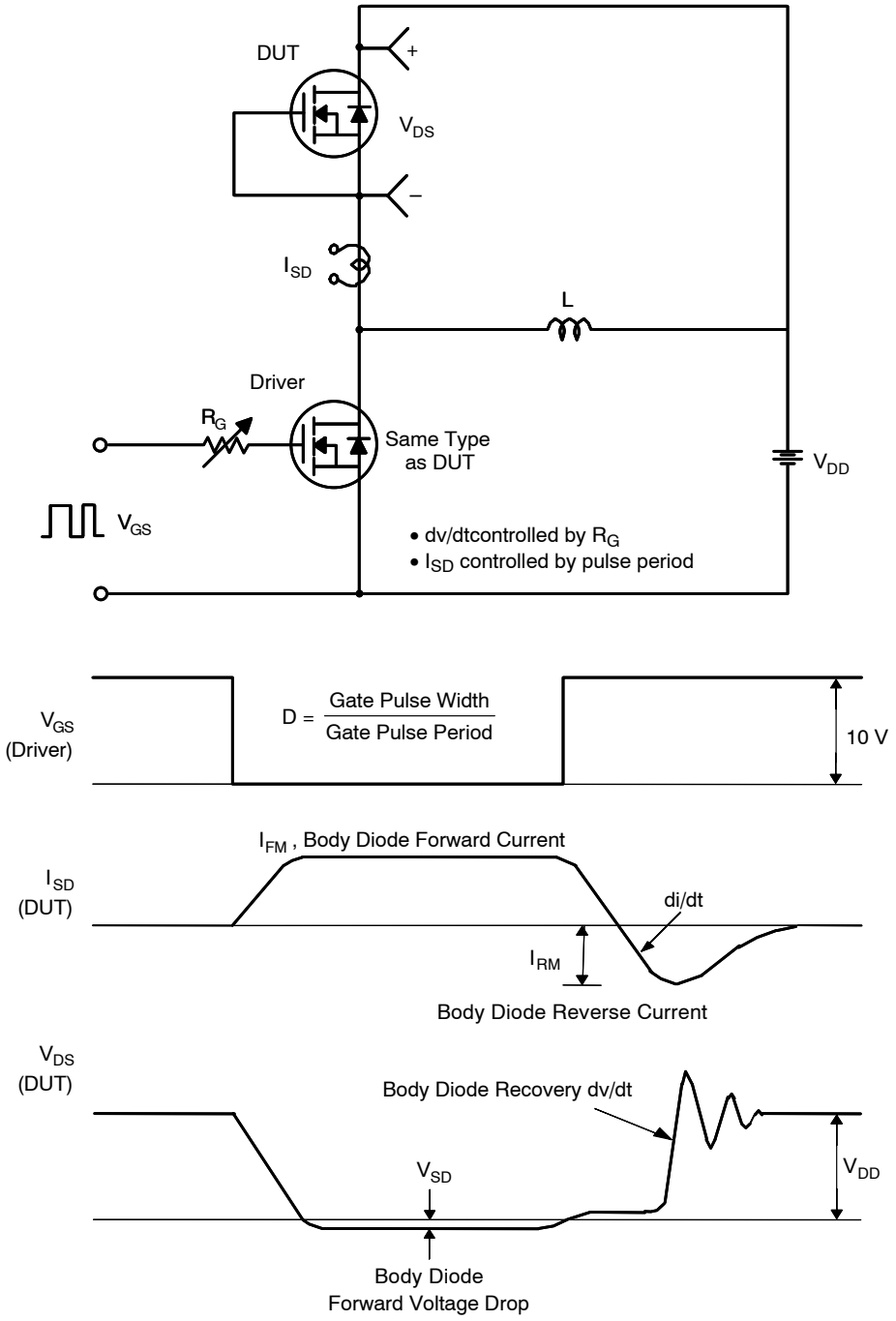
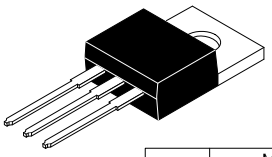


图 15. 峰值二极管恢复 dv/dt 测试电路与波形

封装标识与定购信息

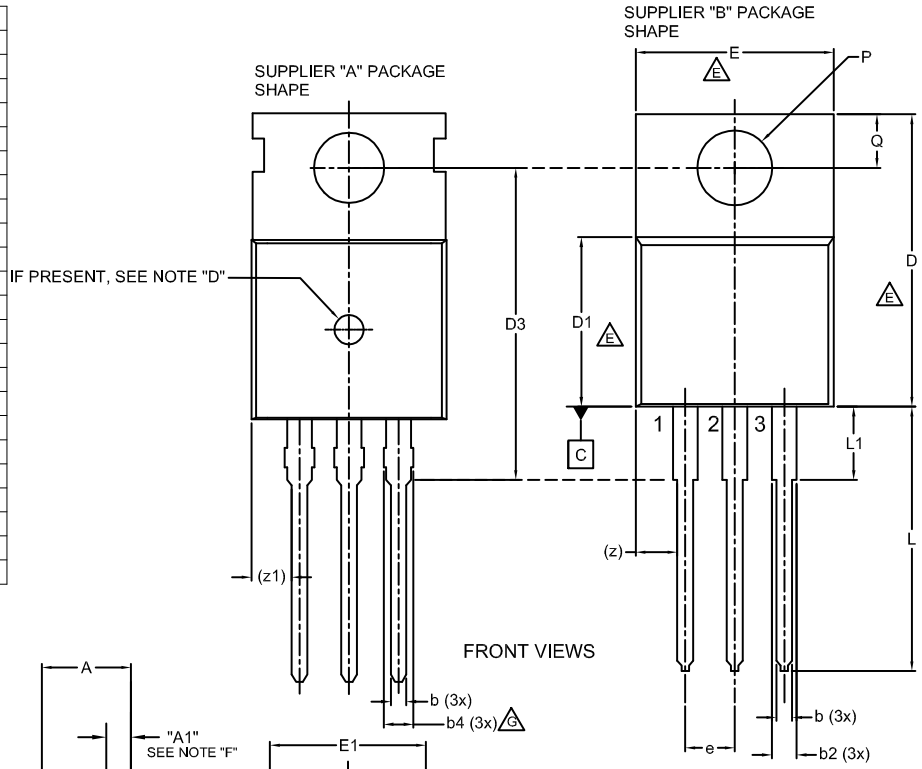
器件编号	顶标	封装	数量
FDP090N10	FDP090N10	TO−220	800 个 / 塑料管

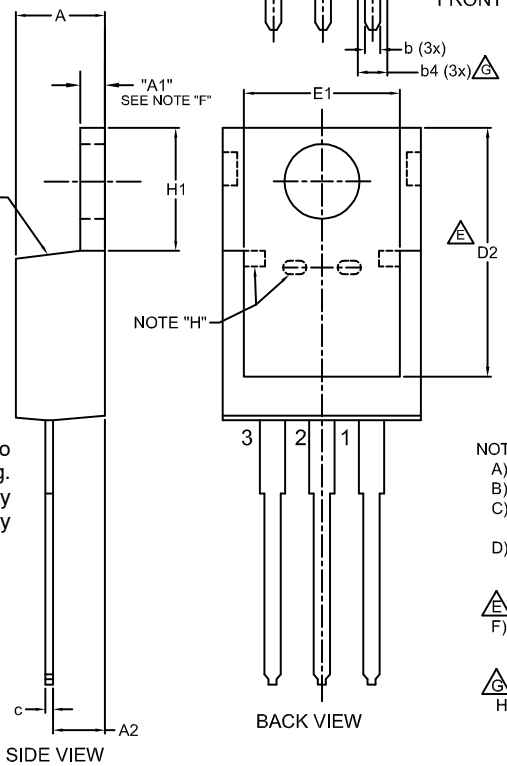


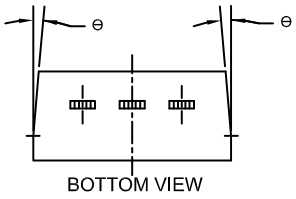
TO−220−3LD
CASE 340AT
ISSUE B

DATE 08 AUG 2022

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	4.00	--	4.70
A1	SEE NOTE "F"		
A2	2.10	--	2.85
b	0.55	--	1.00
b2	1.10	--	1.62
b4	1.42	--	1.62
c	0.36	--	0.60
D	13.90	--	16.30
D1	8.13	--	9.40
D2	11.50	--	14.30
D3	15.42	--	16.51
E	9.65	--	10.67
E1	7.59	--	8.65
e	2.40	--	2.67
H1	6.06	--	6.69
L	12.70	--	14.04
L1	2.70	--	4.10
P	3.50	--	4.00
Q	2.50	--	3.40
z	2.13 REF		
z1	2.06 REF		
Θ	3°	–	5°







GENERIC MARKING DIAGRAM*

XXXX = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
ZZ = Assembly Lot Code

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.

NOTES:
A) REFERENCE JEDEC, TO-220, VARIATION AB
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSIONS COMMON TO ALL PACKAGE SUPPLIERS EXCEPT WHERE NOTED [ ].
D) LOCATION OF MOLDED FEATURE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE)
E) DOES NOT COMPLY JEDEC STANDARD VALUE.
F) "A1" DIMENSIONS AS BELOW:
SINGLE GAUGE = 0.51 - 0.61
DUAL GAUGE = 1.10 - 1.45
G) PRESENCE IS SUPPLIER DEPENDENT
H) SUPPLIER DEPENDENT MOLD LOCKING HOLES IN HEATSINK.

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