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FDI150N10 N 沟道 PowerTrench[®] MOSFET 100 V, 57 A, 16 mΩ

特性

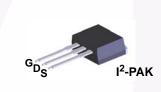
- $R_{DS(on)} = 12 \text{ m}\Omega \text{ (Typ.)} @V_{GS} = 10 \text{ V}, I_D = 49 \text{ A}$
- 快速开关速度
- 低栅极电荷
- 高性能沟道技术可实现极低的 R_{DS(on)}
- 高功率和高电流处理能力
- 符合 RoHS 标准

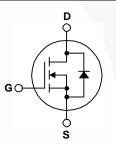
说明

此 N 沟道 MOSFET 采用飞兆半导体先进的 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。

应用

- 用于 ATX/ 服务器 / 电信 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





MOSFET 最大额定值 T_C = 25℃ 除非另有说明。

符号		参数		FDI150N10	单位
V _{DSS}	漏极一源极电压			100	V
V _{GSS}	栅极一源极电压		±20	V	
I _D	旧机中达	- 连续 (T _C = 25°C)		57	Α
	漏极电流	- 连续 (T _C = 100°C)		40	A
I _{DM}	漏极电流	- 脉冲	(说明1)	228	A
E _{AS}	单脉冲雪崩能量	单脉冲雪崩能量 (说明 2)		132	mJ
dv/dt	二极管恢复 dv/dt 峰值		(说明3)	7.5	V/ns
P _D	-++ ±r	(T _C = 25°C)		110	W
	功耗	- 降低至 25°C 以上		0.88	W/°C
T _J , T _{STG}	工作和存储温度范围			-55 至 +150	°C
TL	用于焊接的最大引线温度	,距离外壳 1/8",持续 5 秒		300	°C

热性能

符号	参数	FDI150N10	单位
$R_{ ext{ heta}JC}$	结至外壳热阻最大值	1.13	°C/W
$R_{ ext{ heta}JA}$	结至环境热阻最大值	62.5	0/10

2014年1月

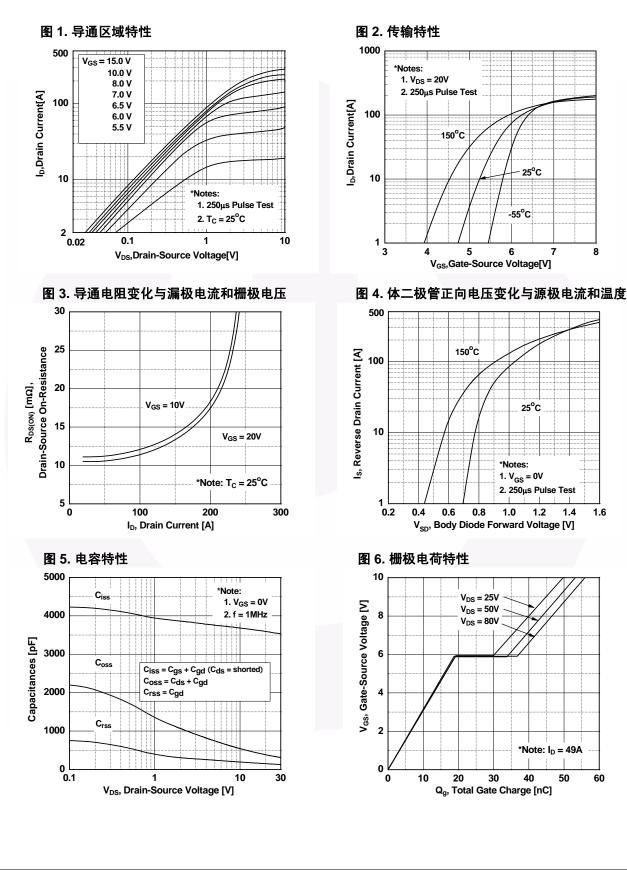
器件编号 顶标		封装	装 包装方法 卷尺寸	带宽		数量			
FDI150			I ² -PAK			不适用		50 个	
	N			I	L				
电气特性	E T _C = 25°C 除	非另有说明。							
符号	; 参数			测试条件		最小值	典型值	最大值	单位
关断特性									
BV _{DSS}	漏极一源极击穿电压			I _D = 250 μA, V _{GS} = 0 V, T _C = 25°C		100	-	-	V
ABV _{DSS}	击穿电压温度系数			I _D = 250 μA,参考温度为 25°C		-	0.1	-	V/°C
/ ∆T _J	山牙屯压温度示奴						0.1		0,0
DSS	零栅极电压漏极电流			$V_{DS} = 100 \text{ V}, \text{ V}_{GS} = 0 \text{ V}$		-	-	1	μA
			_	$V_{DS} = 100 \text{ V}, V_{GS} = 0 \text{ V}, T_{C} = 150^{\circ}\text{C}$		-	-	500 ±100	nA
GSS	栅极 - 体漏	电流	-	$V_{GS} = \pm 20 V, V_{DS} = 0$	J V	-	-	±100	ΠA
导通特性									
V _{GS(th)}	栅极阈值电压			$V_{GS} = V_{DS}, I_{D} = 250 \ \mu A$		2.5	-	4.5	V
R _{DS(on)}	漏极至源极静态导通电阻			V _{GS} = 10 V, I _D = 49 A		-	12	16	mΩ
9 _{FS}	正向跨导			V _{DS} = 20 V, I _D = 49 A		-	156	-	S
动态特性									
	榆入由交		_			-	3580	4760	рF
C _{iss}	输入电容		_	V _{DS} = 25 V, V _{GS} = 0	V,	-	3580 340	4760	pF pF
C _{iss} C _{oss}	输出电容	28	_	V _{DS} = 25 V, V _{GS} = 0 f = 1 MHz	V,	-		4760 450 210	pF pF pF
C _{iss} C _{oss} C _{rss}	=	容			V,	-	340	450	, pF
C _{iss} C _{oss} C _{rss}	输出电容	1容			V,	-	340	450	, pF
C _{iss} C _{oss} C _{rss} 开关特性	输出电容			f = 1 MHz		-	340 140 47	450 210 104	, pF
C _{iss} C _{oss} C _{rss} 开关特性	输出电容 反向传输电 导通延迟时 开通上升时	问		f = 1 MHz V _{DD} = 50 V, I _D = 49 /	4 ,	-	340 140 47 164	450 210 104 338	pF pF ns ns
C _{iss} C _{oss} C _{rss} 开关特性	输出电容 反向传输电 导通延迟时 开通上升时 关断延迟时	问 问 问		f = 1 MHz	Α, Ω	-	340 140 47 164 86	450 210 104 338 182	pF pF ns
C _{iss} C _{oss} C _{rss} 开关特性 t _{d(on)} t _r t _{d(off)}	输出电容 反向传输电 导通延迟时 开通上升时 关断延迟时 关断下降时	问 问 问		f = 1 MHz V _{DD} = 50 V, I _D = 49 /	4 ,	-	340 140 47 164 86 83	450 210 104 338 182 176	pF pF ns ns ns ns
Criss Coss Crss d(on) r d(off) f Q _{g(tot)}	输出电容 输出电容 反向传输电 导通延迟时 开通上升时 关断延迟时 关断下降时 10 V 的栅机	间 间 间 吸电荷总量		f = 1 MHz $V_{DD} = 50 V, I_D = 49 V$ $V_{GS} = 10 V, R_G = 25$ $V_{DS} = 80 V, I_D = 49 V$	À, Ω (说明 4)	-	340 140 47 164 86 83 53	450 210 104 338 182 176 69	pF pF ns ns ns ns nC
Criss Coss Crss d(on) r d(off) f Q _{g(tot)}	输出电容 反向传输电 导通延迟时 开通上升时 关断下降时 10 V 的栅机 栅极 - 源极	间 间 间 吸电荷总量 栅极电荷		f = 1 MHz V _{DD} = 50 V, I _D = 49 / V _{GS} = 10 V, R _G = 25	A, Ω (说明 4) A,	-	340 140 47 164 86 83 53 19	450 210 104 338 182 176	pF pF ns ns ns ns nC
C _{iss} C _{oss} C _{rss} 开关特性 d(on) dr d(off) dr Q _{g(tot)} Q _{gs}	输出电容 反向传输电 导通延迟时 开通上升时 关断下降时 10 V 的栅机 栅极 - 源极	间 间 间 吸电荷总量		f = 1 MHz $V_{DD} = 50 V, I_D = 49 V$ $V_{GS} = 10 V, R_G = 25$ $V_{DS} = 80 V, I_D = 49 V$	À, Ω (说明 4)	-	340 140 47 164 86 83 53	450 210 104 338 182 176 69	pF pF ns ns ns ns nC
C _{iss} C _{oss} C _{rss} 开关特性 td(on) tr td(off) tr Q _{g(tot)} Q _{gs} Q _{gd}	输出电容 反向传输电 导通延迟时 开通上升时 关断下降时 10 V 的栅机 栅极 - 源极	间 间 间 回 吸电荷总量 栅极电荷 " 米勒 " 电荷		f = 1 MHz $V_{DD} = 50 V, I_D = 49 V$ $V_{GS} = 10 V, R_G = 25$ $V_{DS} = 80 V, I_D = 49 V$	A, Ω (说明 4) A,	-	340 140 47 164 86 83 53 19	450 210 104 338 182 176 69	pF pF ns ns ns ns nC
Ciss Coss Crss H关特性 d(on) f Q _{g(tot}) Q _{gs} Q _{gd} 漏极 - 源权	输出电容 反向传输电 导通延迟时时 关断下降时 10 V 的栅极 栅极 - 源极 极二极管特性	i间 i间 t间 吸电荷总量 栅极电荷 " 米勒 " 电荷		f = 1 MHz $V_{DD} = 50 V, I_D = 49 V$ $V_{GS} = 10 V, R_G = 25$ $V_{DS} = 80 V, I_D = 49 V$	A, Ω (说明 4) A,	-	340 140 47 164 86 83 53 19	450 210 104 338 182 176 69	pF pF ns ns ns ns nC
Ciss Coss Crss H关特性 d(on) r d(off) f Q _{g(tot)} Q _{gs} Q _{gd} 漏极 - 源材 S	输出电容 反向传输电 导通延迟时时 关断下的时时 10 V 的栅极 栅极 - 源极 极二极管特性 漏极 - 源极	间 		f = 1 MHz $V_{DD} = 50 V, I_D = 49 V$ $V_{GS} = 10 V, R_G = 25$ $V_{DS} = 80 V, I_D = 49 V$	A, Ω (说明 4) A,	- - - - - - - - - - -	340 140 47 164 86 83 53 19 15	450 210 104 338 182 176 69 - -	pF pF ns ns ns nC nC
C _{iss} C _{oss} C _{rss} 开关特性 ^t d(on) t _r t _d (off) t _f Q _{g(tot)} Q _{gg} Q _{gd} 漏极 - 源极 I _S	输出电容 输出电容 反向传输电 导通延迟时 开通上升时 关断下路地区降时 10 V 的栅极 栅极 - 源极 人、一极管特性 漏极 - 源极 漏极 - 源极	i间 i间 t间 吸电荷总量 栅极电荷 " 米勒 " 电荷		f = 1 MHz $V_{DD} = 50 V, I_D = 49 V$ $V_{GS} = 10 V, R_G = 25$ $V_{DS} = 80 V, I_D = 49 V$	A, Ω (说明 4) A, (说明 4)	- - - - - - - - - - -	340 140 47 164 86 83 53 19 15	450 210 104 338 182 176 69 - - - 57	pF pF ns ns ns nc nC nC
C _{iss} C _{oss} C _{rss} 开关特性 t _{d(on)} t _r t _{d(off)} t _f Q _{g(tot)} Q _{gs} Q _{gd} 漏极 - 源材	输出电容 输出电容 反向传输电 导通延迟时 开通上升时 关断下路地区降时 10 V 的栅极 栅极 - 源极 人、一极管特性 漏极 - 源极 漏极 - 源极	1间 1间 1间 处电荷总量 栅极电荷 "米勒"电荷 走 二极管最大正向连续 二极管最大正向脉冲 二极管正向电压		f = 1 MHz $V_{DD} = 50 V, I_D = 49 V$ $V_{GS} = 10 V, R_G = 25$ $V_{DS} = 80 V, I_D = 49 V$ $V_{GS} = 10 V$	A, Ω (说明 4) A, (说明 4)		340 140 47 164 86 83 53 19 15	450 210 104 338 182 176 69 - - - 57 228	pF pF ns ns ns nC nC nC A A

注意:

1. 重复额定值: 脉冲宽度受限于最大结温。 2: L=0.11 mH, I_{AS}=49 A, V_{DD}=50 V, R_G=25 Ω, 开始 T_J=25°C。 3: I_{SD} ≤ 49 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。

FDI150N10 — N 沟道 PowerTrench[®] MOSFET

典型性能特征



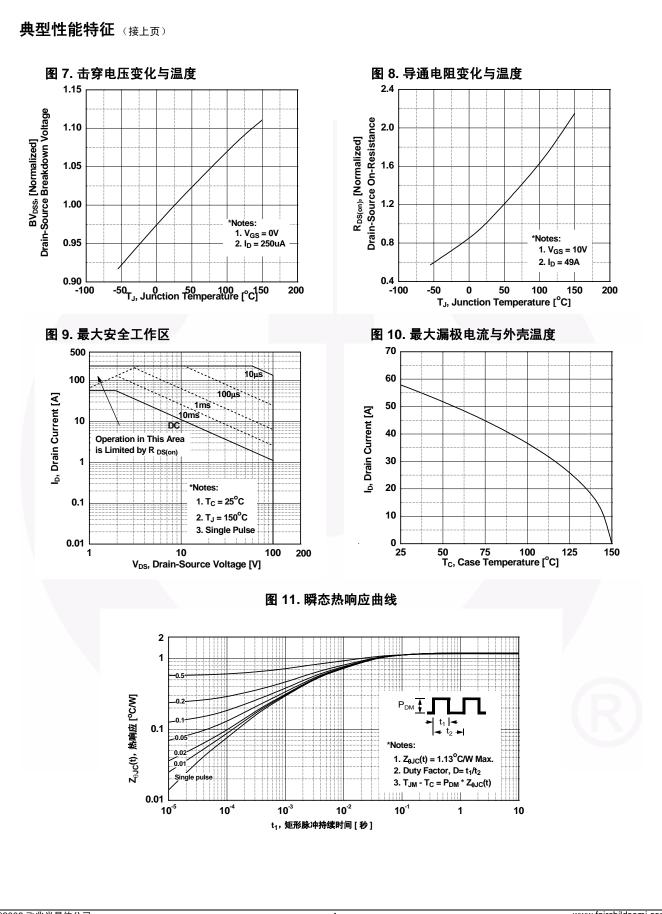
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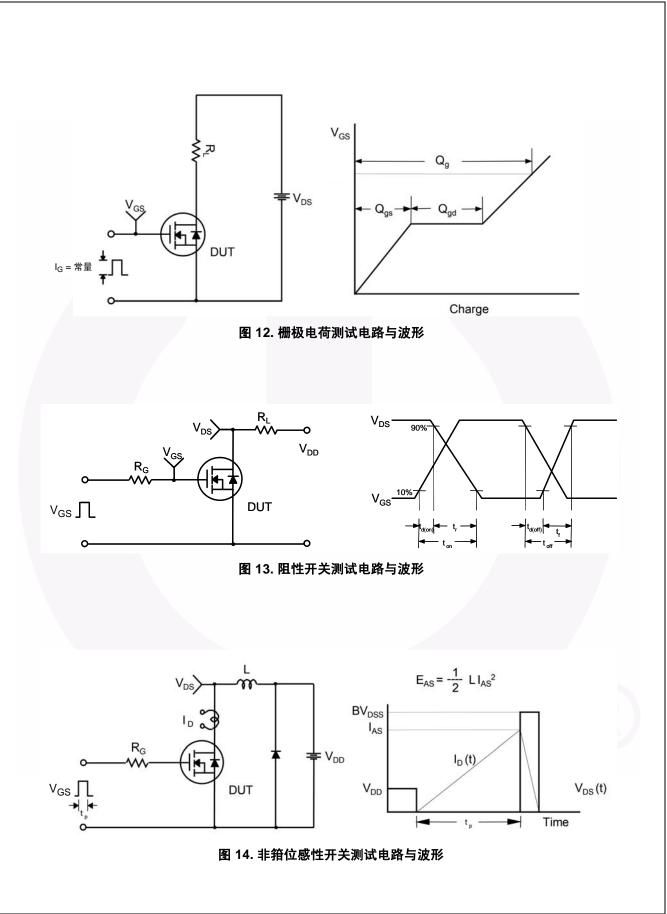
1.6

60

3

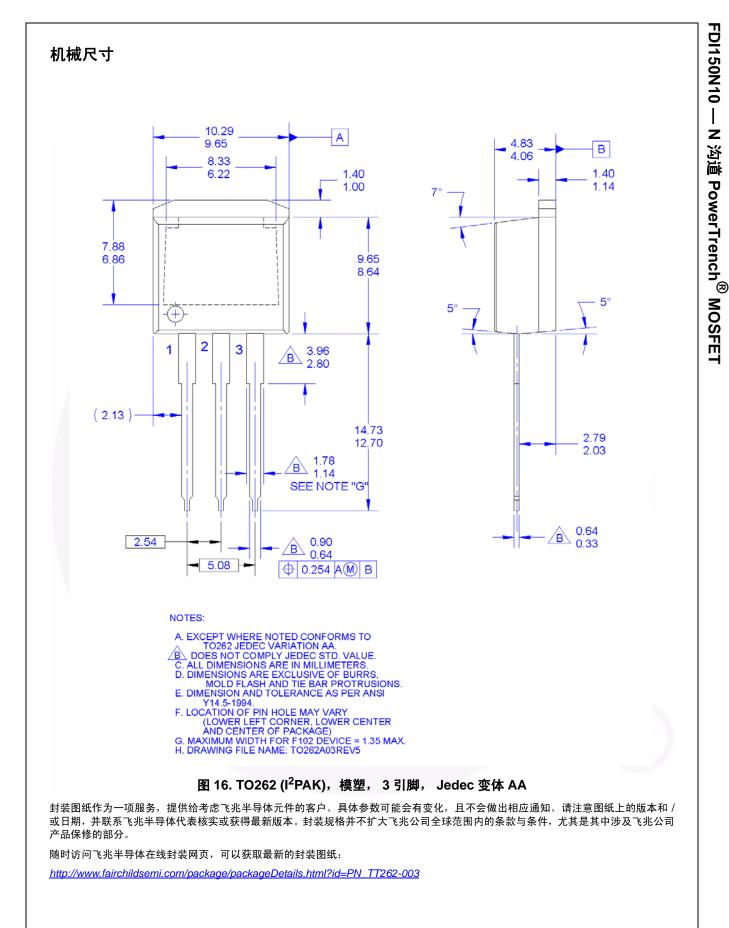


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DUT + V_{DS} a ۱_{sd} م L Driver R_G€ Same Type as DUT L F ∨_{DD} ∏∏ V_{GS} • dv/dt controlled by R_{G} • I_{SD} controlled by pulse period ſ Gate Pulse Width Gate Pulse Period V_{GS} D = 10V (Driver) I_{FM}, Body Diode Forward Current I _{SD} di/dt (DUT) I_{RM} Body Diode Reverse Current V_{DS} (DUT) Body Diode Recovery dv/dt V_{SD} V_{DD} Body Diode Forward Voltage Drop 图 15. 峰值二极管恢复 dv/dt 测试电路与波形





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