

400V N 沟道 MOS 场效应管

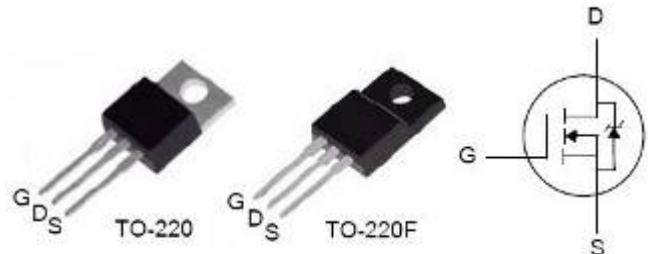
产品特点

- 低的导通电阻
- 低的栅极电荷(典型值为18.6nC)
- 开关速度快
- 100%雪崩测试
- 符合RoHS标准/无铅封装

产品应用

- 高效开关电源
- 适配器/充电器
- 有源功率因数校正
- 液晶面板电源

BV_{DSS}	$R_{DS(ON)}$ (Max.)	I_D
400V	1.0 Ω	5.5A



订购代码

器件型号	封装形式	标识
FTP06N40	TO-220	FTP06N40
FTA06N40	TO-220F	FTA06N40

极限值

除非另有说明，均指 $T_C=25^\circ\text{C}$

符号	参数描述	FTP06N40	FTA06N40	单位
V_{DSS}	漏极-源极电压 ^[1]	400		V
I_D	漏极电流连续值 ($T_C=25^\circ\text{C}$)	5.5	5.5*	A
$I_{D@100^\circ\text{C}}$	漏极电流连续值 ($T_C=100^\circ\text{C}$)	Figure 3		
I_{DM}	漏极电流脉冲值 ^[2]	Figure 6		
P_D	功耗 ($T_C=25^\circ\text{C}$)	95	25	W
	功耗降额因子 ($T_C > 25^\circ\text{C}$)	0.76	0.2	W/ $^\circ\text{C}$
V_{GS}	栅极-源极电压	± 30		V
E_{AS}	单脉冲雪崩能量 $L=18\text{mH}$, $I_D=5.5\text{A}$	270		mJ
dv/dt	二极管反向恢复 dv/dt 尖峰值 ^[3]	4.5		V/ns
T_L	焊接温度	300		$^\circ\text{C}$
	(距离管壳1.6mm处, 10秒)			
T_J 和 T_{STG}	结温和储存温度	-55 to 150		

*漏极电流受最高结温的限制。

注意：施加的电的或热的应力大于“极限值”表中所列参数值，可能导致器件永久的损坏。

热特性

符号	参数描述	FTP06N40	FTA06N40	单位
$R_{\theta JC}$	结-管壳热阻	1.32	5.0	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	结-环境热阻	65	65	

电特性

关断特性

 除非另有说明, 均指 $T_C = 25^\circ\text{C}$

符号	参数描述	最小值	典型值	最大值	单位	测试条件
BV_{DSS}	漏极-源极击穿电压	400	--	--	V	$V_{GS}=0V, I_D=250\mu A$
$\Delta BV_{DSS}/\Delta T_J$	击穿电压温度系数	--	0.6	--	$V/^\circ\text{C}$	以 25°C 为参考, $I_D=250\mu A$
I_{DSS}	漏极-源极泄漏电流	--	--	12	μA	$V_{DS}=400V, V_{GS}=0V$
		--	--	100		$V_{DS}=320V, V_{GS}=0V,$ $T_C=125^\circ\text{C}$
I_{GSS}	栅极-源极泄漏电流	--	--	100	nA	$V_{GS}=+30V$
		--	--	-100		$V_{GS}=-30V$

导通特性

 除非另有说明, 均指 $T_C = 25^\circ\text{C}$

符号	参数描述	最小值	典型值	最大值	单位	测试条件
$R_{DS(ON)}$	漏极-源极导通电阻	--	0.8	1.0	Ω	$V_{GS}=10V, I_D=3.3A^{[4]}$
$V_{GS(TH)}$	栅极阈值电压	2.0	--	4.0	V	$V_{DS} = V_{GS}, I_D=250\mu A$
gfs	正向跨导	--	5.7	--	S	$V_{DS} = 15V, I_D=5.5A^{[4]}$

动态特性

基本上与工作温度无关

符号	参数描述	最小值	典型值	最大值	单位	测试条件
C_{ISS}	输入电容	--	622	--	pF	$V_{GS}=0V$ $V_{DS}=25V$ $f=1.0MHz$ Figure 14
C_{OSS}	输出电容	--	65	--		
C_{RSS}	反向传输电容	--	13.3	--		
Q_G	栅极总电荷	--	18.6	--	nC	$V_{DD}=200V$ $I_D=5.5A$ Figure 15
Q_{GS}	栅极-源极电荷	--	1.7	--		
Q_{GD}	栅极-漏极(密勒)电荷	--	6.8	--		

开关特性

基本上与工作温度无关

符号	参数描述	最小值	典型值	最大值	单位	测试条件
$t_{d(ON)}$	开启延迟时间	--	17	--	ns	$V_{DD}=200V$ $I_D=5.5A$ $V_{GS}=10V$ $R_G=20\Omega$
t_{rise}	上升时间	--	61	--		
$t_{d(OFF)}$	关断延迟时间	--	26	--		
t_{fall}	下降时间	--	36	--		



体二极管特性

除非另有说明，均指 $T_C = 25^\circ\text{C}$

符号	参数描述	最小值	典型值	最大值	单位	测试条件
I_{SD}	体二极管连续电流	--	--	5.5	A	Integral P-N diode in MOSFET
I_{SM}	体二极管最大脉冲电流	--	--	22	A	
V_{SD}	体二极管正向压降	--	--	1.2	V	$I_S=5.5\text{A}, V_{GS}=0\text{V}$
t_{rr}	反向恢复时间	--	208	--	ns	$V_{GS}=0\text{V}$ $I_F=5.5\text{A}, di/dt=100\text{A}/\mu\text{s}$
Q_{rr}	反向恢复电荷	--	1000	--	nC	

注意:

- [1] $T_J = +25^\circ\text{C}$ to $+150^\circ\text{C}$
- [2] 重复性极限值，脉冲宽度受最高结温限制
- [3] $I_{SD}=5.5\text{A}, di/dt \leq 100\text{A}/\mu\text{s}, V_{DD} \leq BV_{DSS}, T_J = +150^\circ\text{C}$
- [4] 脉冲宽度 $\leq 380\mu\text{s}$; 占空比 $\leq 2\%$.

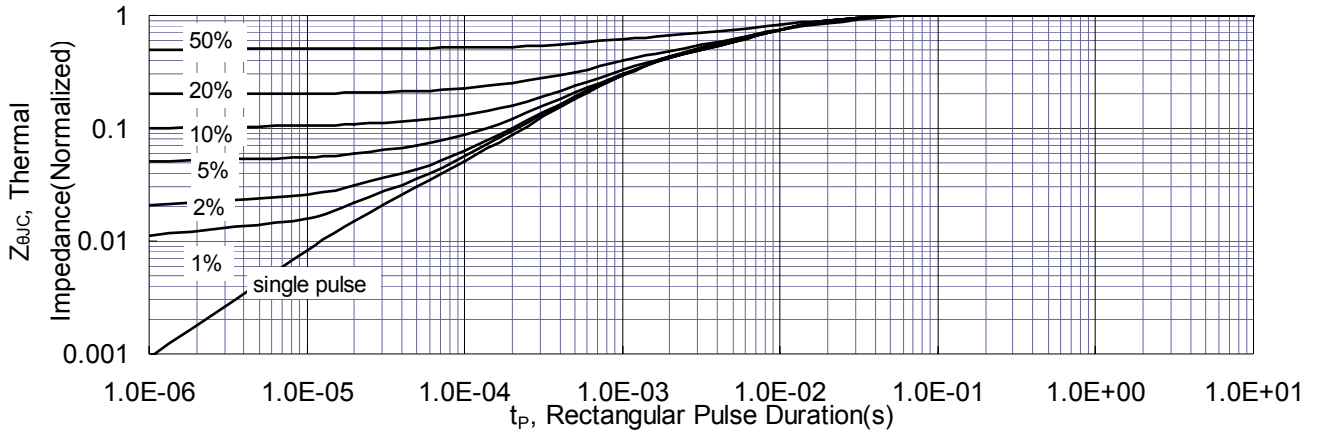
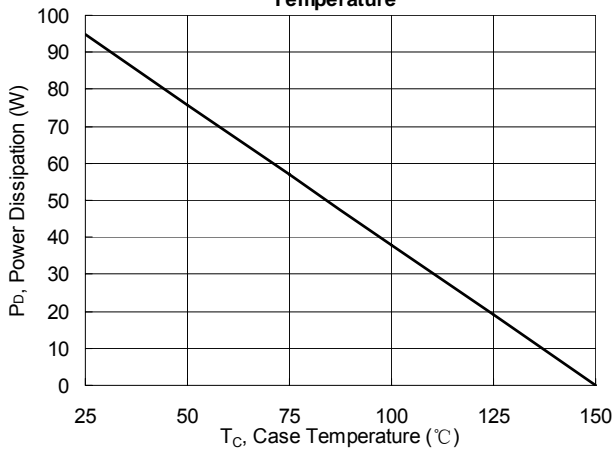
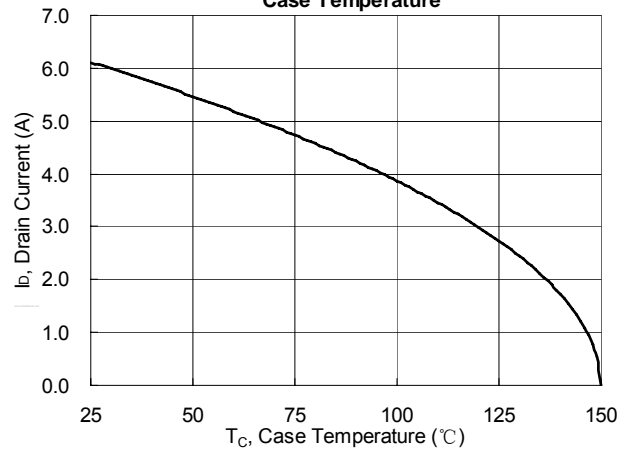
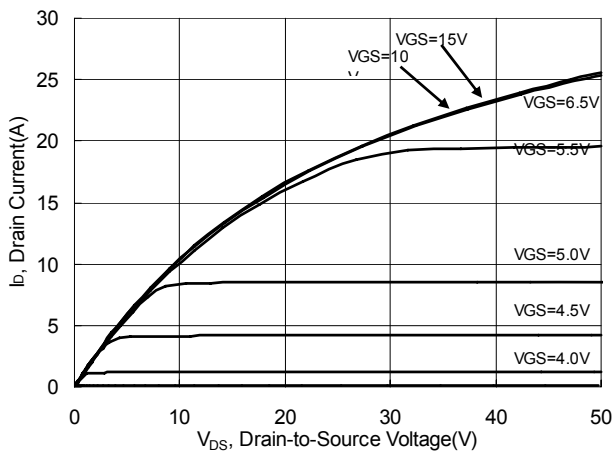
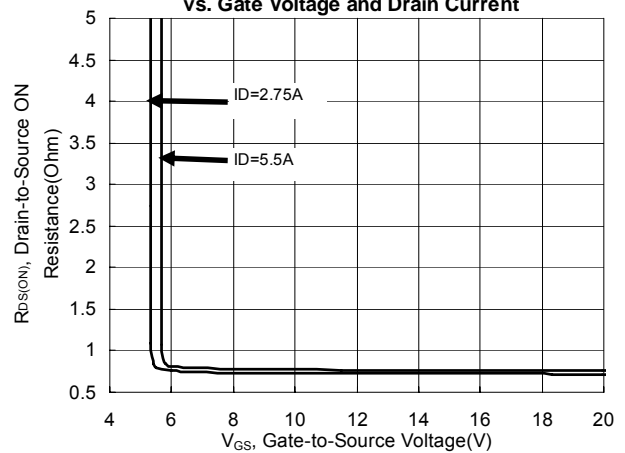
Figure 1. Maximum Effective Thermal Impedance, Junction-to-Case

Figure 2. Maximum Power Dissipation vs. Case Temperature

Figure 3. Maximum Continuous Drain Current vs Case Temperature

Figure 4. Typical Output Characteristics

Figure 5. Typical Drain-to-Source ON Resistance vs. Gate Voltage and Drain Current


Figure 6. Maximum Peak Current Capability

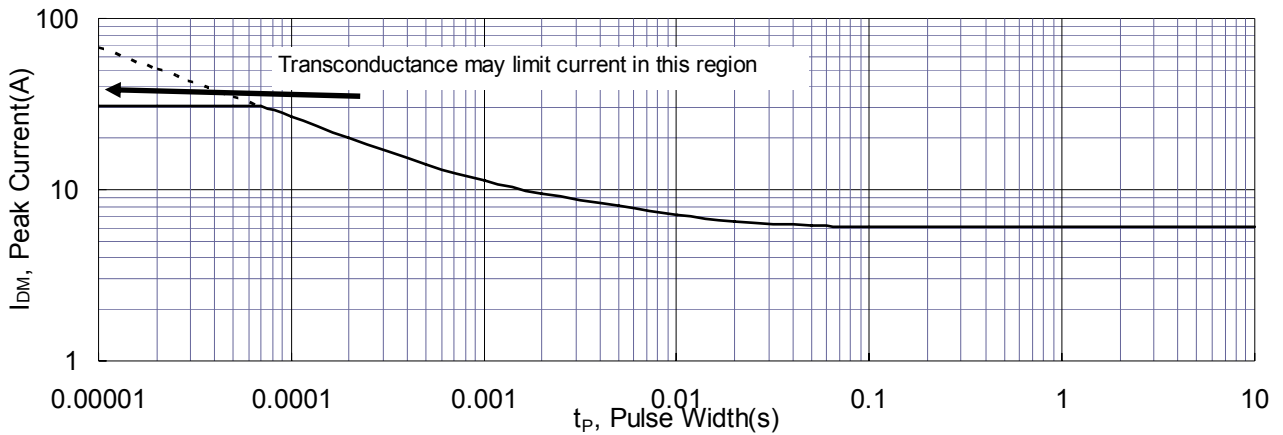


Figure 7. Typical Transfer Characteristics

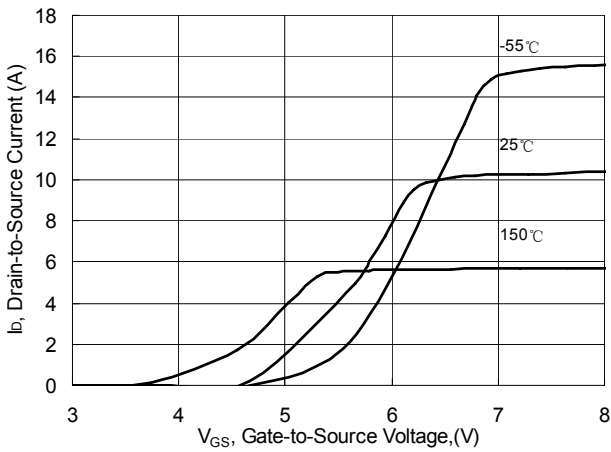


Figure 8. Unclamped Inductive Switching Capability

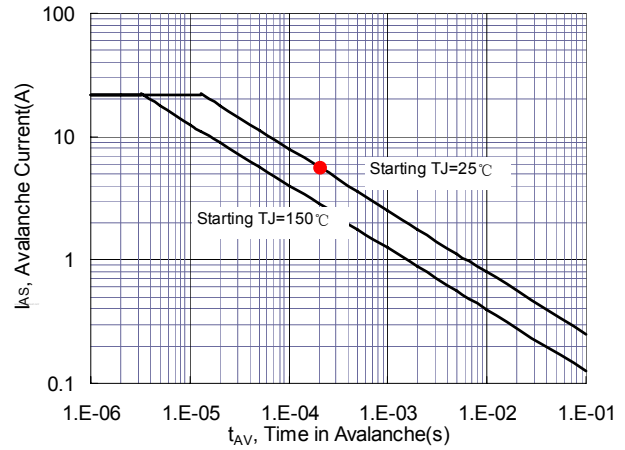


Figure 9. Typical Drain-to-Source ON Resistance

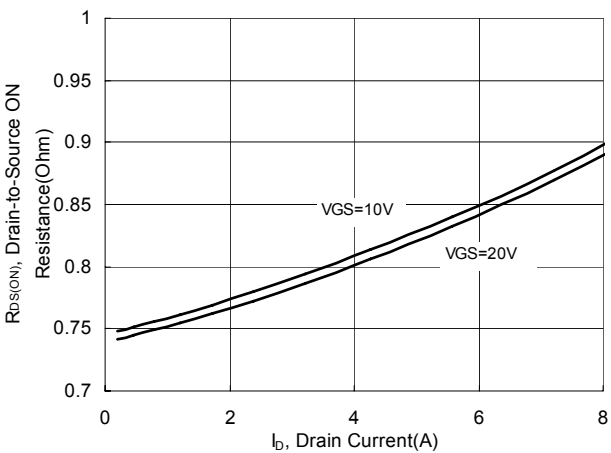


Figure 10. Typical Drain-to-Source On Resistance vs. Junction Temperature

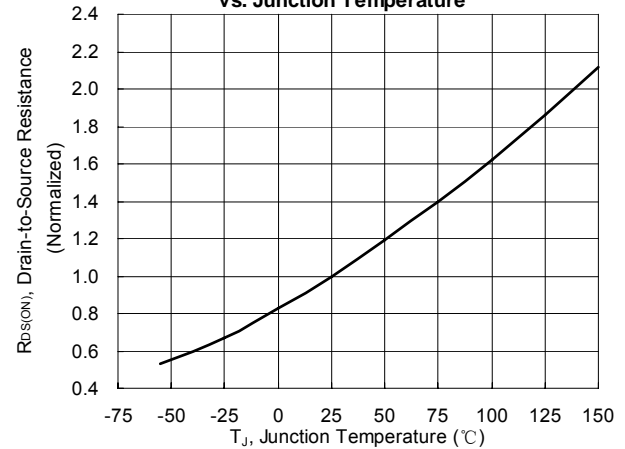


Figure 11. Typical Breakdown Voltage vs. Junction Temperature

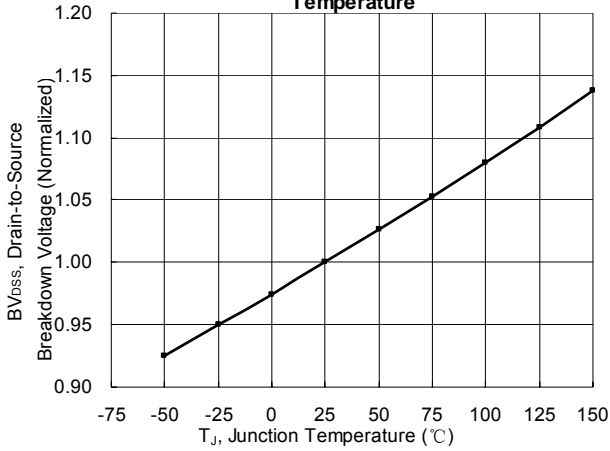


Figure 12. Typical Threshold Voltage vs. Junction Temperature

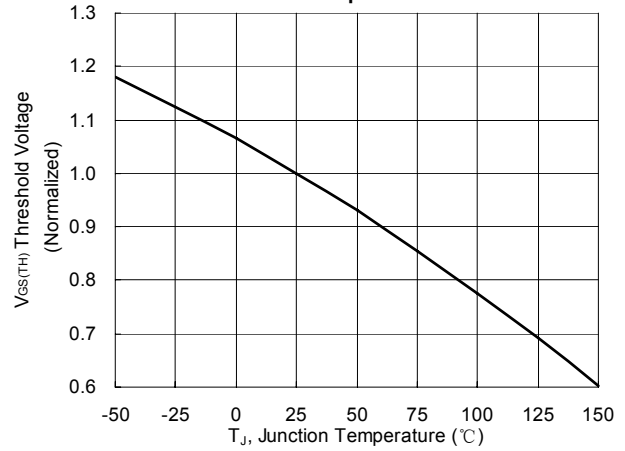


Figure 13. Maximum Forward Safe Operation Area

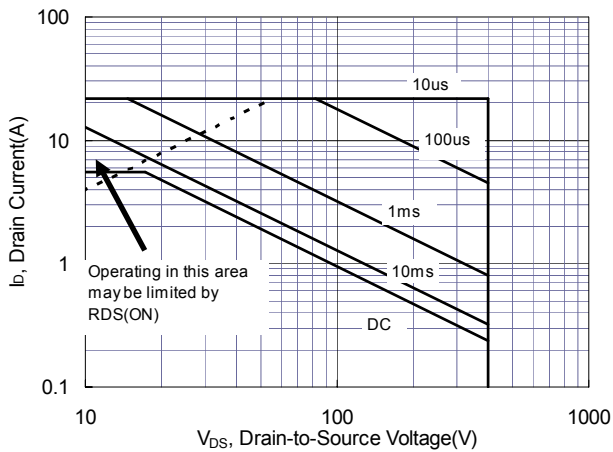


Figure 14. Typical Capacitance vs. Drain-to-Source Voltage

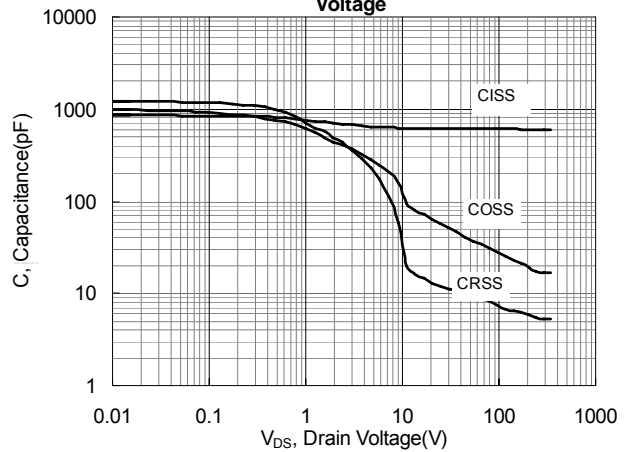


Figure 15. Typical Gate Charge vs. Gate-to-Source Voltage

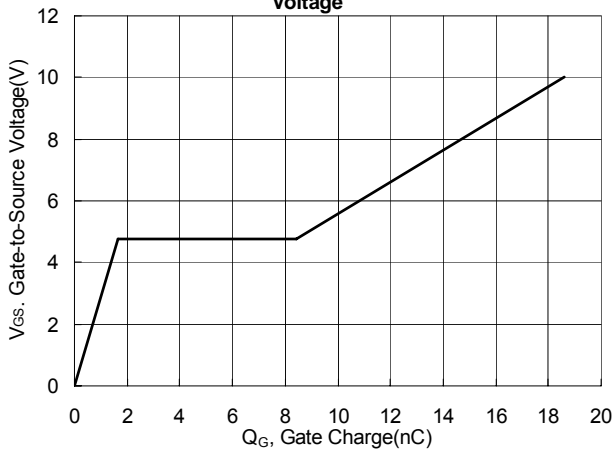
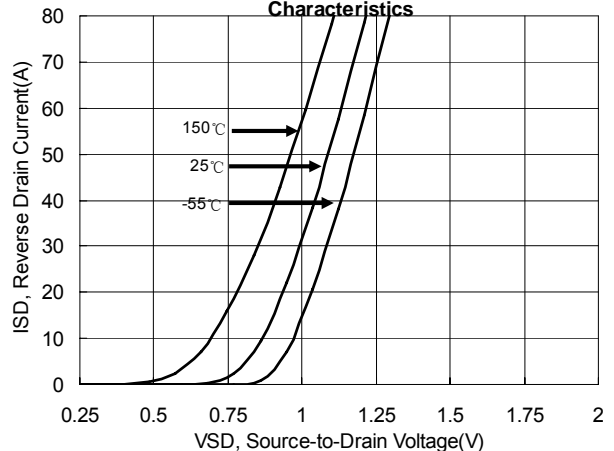


Figure 16. Typical Body Diode Transfer Characteristics



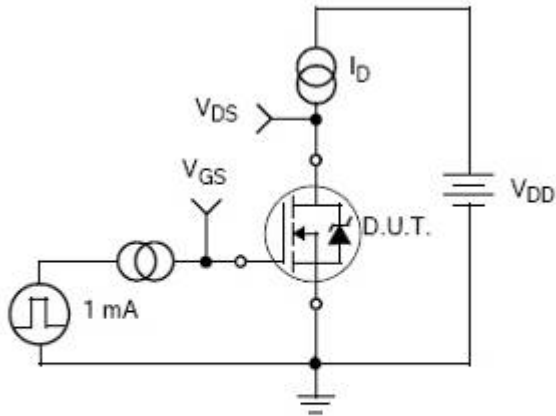
测试电路


Figure 17. Gate Charge Test Circuit

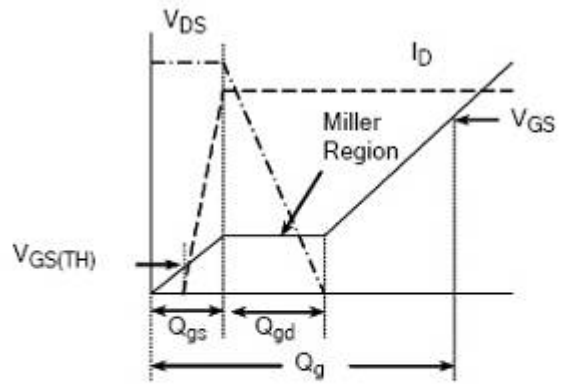


Figure 18. Gate Charge Waveform

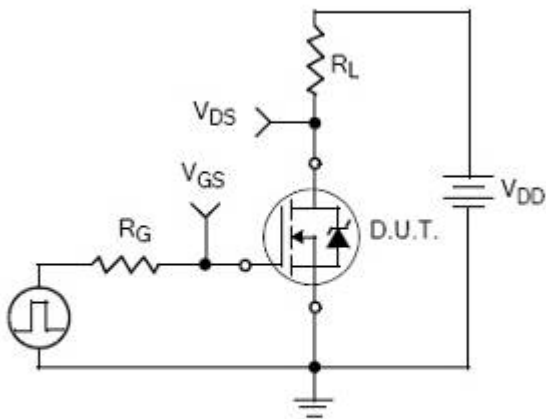


Figure 19. Resistive Switching Test Circuit

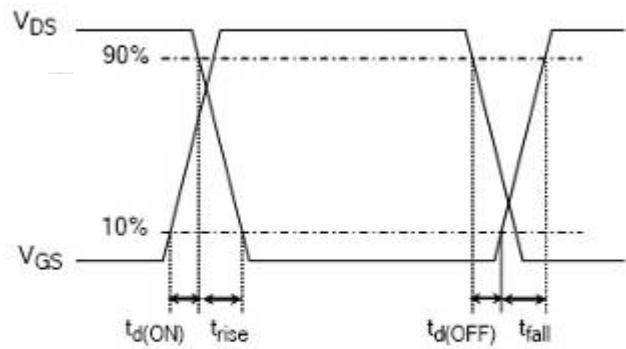


Figure 20. Resistive Switching Waveforms

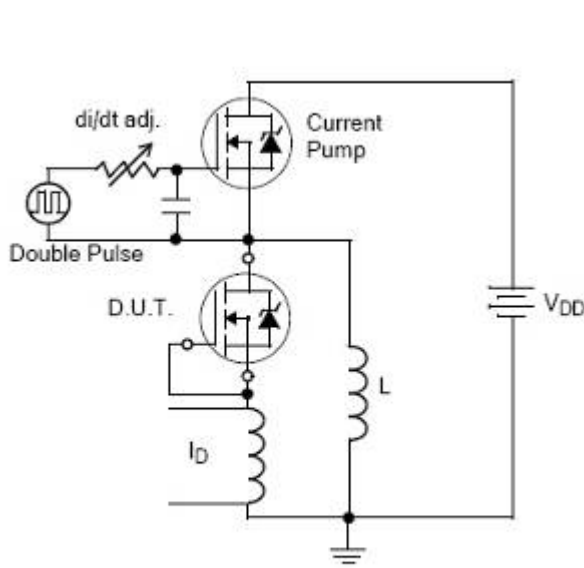


Figure 21. Diode Reverse Recovery Test Circuit

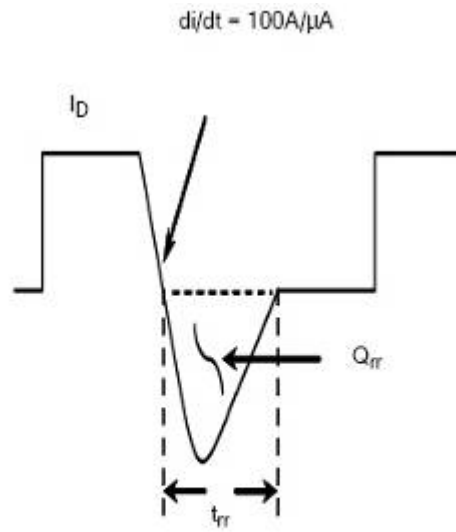


Figure 22. Diode Reverse Recovery Waveform

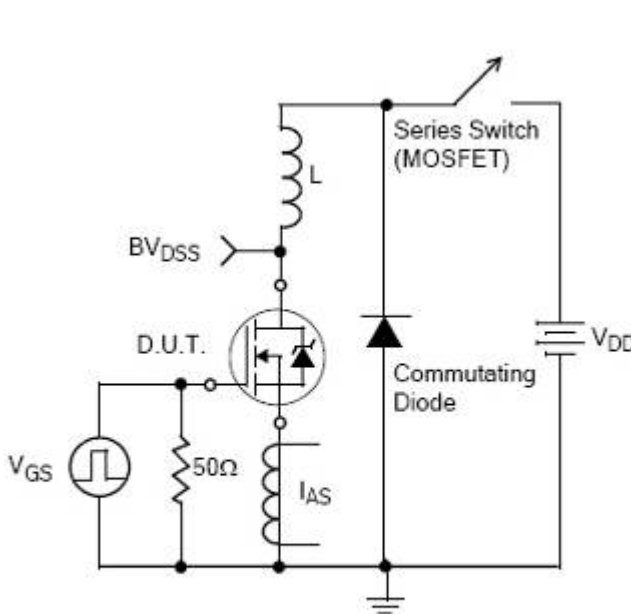


Figure 23. Unclamped Inductive Switching Test Circuit

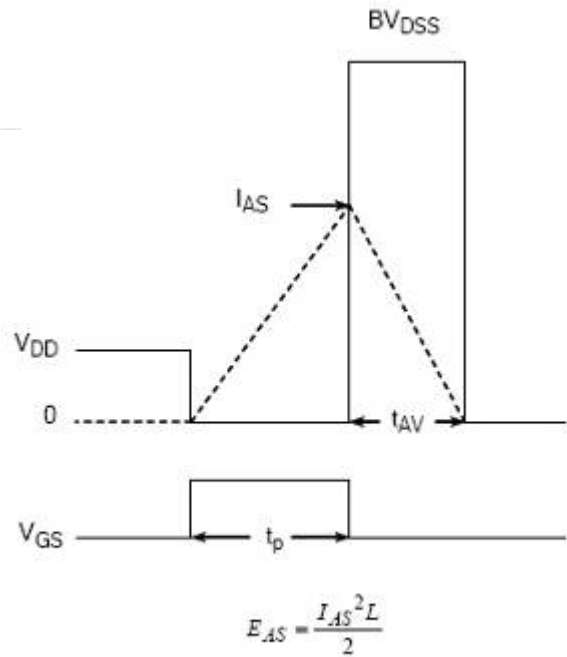
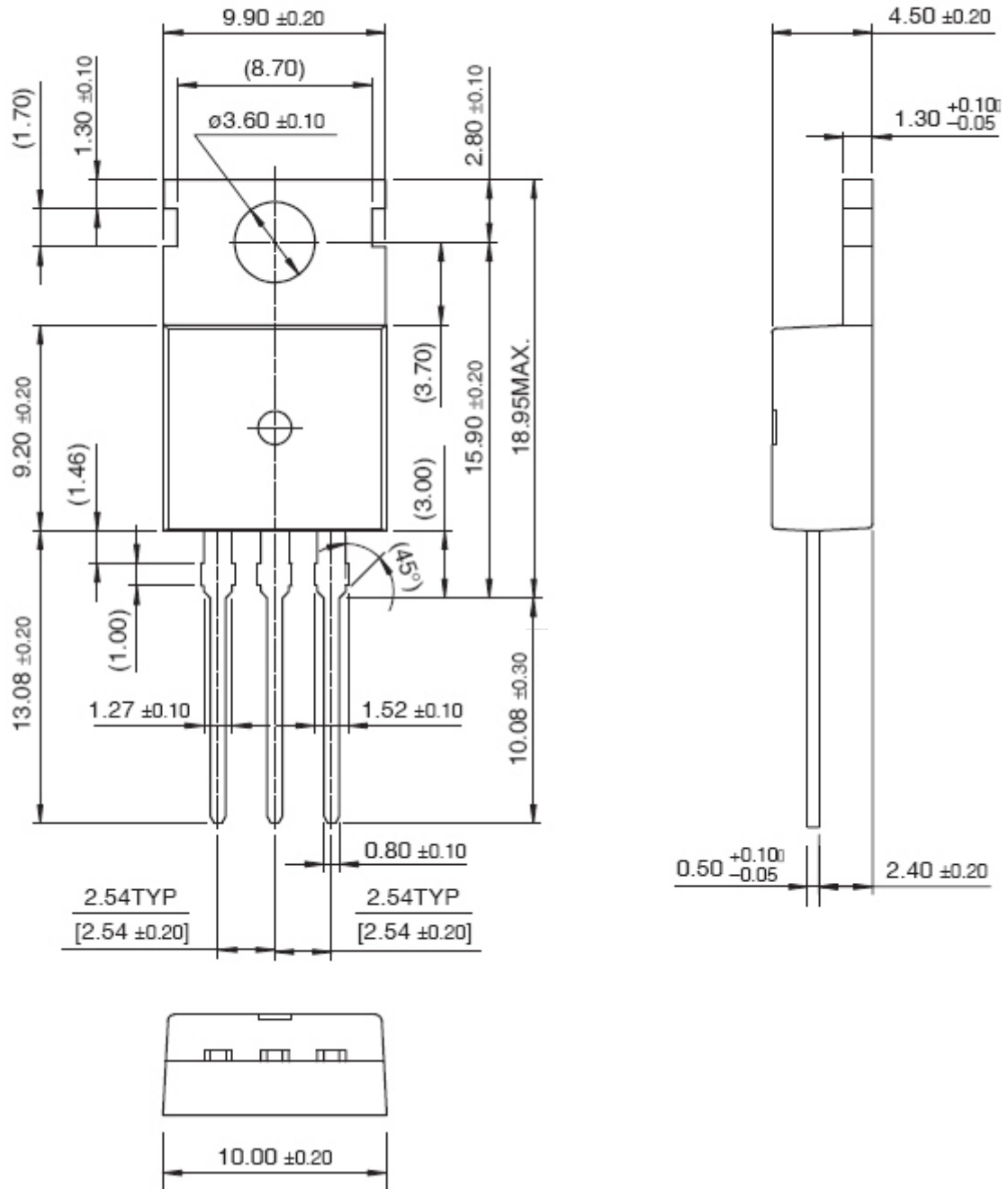


Figure 24. Unclamped Inductive Switching Waveforms

封装尺寸

TO-220





声明

ARK Microelectronics Co., Ltd. reserves the right to make change without notice in order to improve reliability, function or design and to discontinue any product or service without notice. Customers should obtain the latest relevant information before orders and should verify that such information is current and complete. All products are sold subject to ARK Microelectronics Co., Ltd's terms and conditions supplied at the time of order acknowledgement.

ARK Microelectronics Co., Ltd. warrants performance of its hardware products to the specifications at the time of sale, Testing, reliability and quality control are used to the extent ARK Microelectronics Co., Ltd deems necessary to support this warrantee. Except where agreed upon by contractual agreement, testing of all parameters of each product is not necessary performed.

ARK Microelectronics Co., Ltd. does not assume any liability arising from the use of any product or circuit designs described herein. Customers are responsible for their products and applications using ARK Microelectronics Co., Ltd's components. To minimize risk, customers must provide adequate design and operating safeguards.

ARK Microelectronics Co., Ltd. does not warrant or convey any license either expressed or implied under its patent rights, nor the rights of others. Reproduction of information in ARK Microelectronics Co., Ltd's data sheets or data books is permissible only if reproduction is without modification or alteration. Reproduction of this information with any alteration is an unfair and deceptive business practice. ARK Microelectronics Co., Ltd is not responsible or liable for such altered documentation.

Resale of ARK Microelectronics Co., Ltd's products with statements different from or beyond the parameters stated by ARK Microelectronics Co., Ltd. for the product or service voids all express or implied warranties for the associated ARK Microelectronics Co., Ltd's product or service and is unfair and deceptive business practice. ARK Microelectronics Co., Ltd is not responsible or liable for any such statements.

Life Support Policy:

ARK Microelectronics Co., Ltd's products are not authorized for use as critical components in life devices or systems without the expressed written approval of ARK Microelectronics Co., Ltd.

As used herein:

1. Life support devices or systems are devices or systems which:
 - a. are intended for surgical implant into the human body,
 - b. support or sustain life,
 - c. whose failure to perform when properly used in accordance with instructions for used provided in the labeling, can be reasonably expected to result in significant injury to the user.
 2. A critical component is any component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.
-

成都方舟微电子有限公司

四川省成都市武侯区人民南路四段 53 号嘉云台乙栋 11 楼 E 座

电话: +86-28-85232215

传真: +86-28-85256679