XT09R5N04C

TO-252

N沟道40V/50A功率MOS管

40V/50A N Channel Advanced Power MOSFET

Product Summary产品概述	
VDS	40V
ID	50A
RDSON (Typ@10V)	7.0mΩ
RDSON(Typ@4.5V)	10mΩ

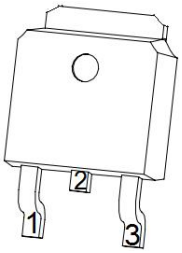
Features特征

- Low Rds(on)@V_{GS}= 10V 低的导通电阻
- 100% UIS Tested 100%雪崩能量测试
- Halogen-free、RoHS Compliant 无卤、RoHS认证

Applications应用

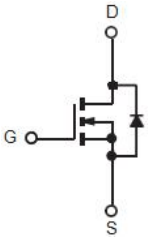
- Battery Protection and Load Switch 电源保护和负载开关
- Voltage Regulator Modules 电压调节模块
- Point-of-Load (POL) Modules 荷载点模块
- Brushed and Brushless Motor Control 有刷/无刷马达控制

Pin Definition脚位定义



1. Gate
2. Drain
3. Source

Equivalent circuit等效电路



Order Information订货信息

Product型号	Marking印字	Package封装	Packing包装规格	Min Unit Quantity最小包装数量
XT09R5N04C	XZT09R5N04C	TO-252	2500 PCS/Reel	2500 PCS

Maximum Ratings & Thermal Characteristics (Ratings at 25℃ ambient temperature unless otherwise specified.)

极限值和温度特性(TA = 25℃ 除非另有规定)

Parameters参数	Symbol符号	Value数值	Unit单位
Drain-Source Voltage漏源电压	V_{DS}	40	V
Gate-Source Voltage栅源电压	V_{GS}	±20	V
Continuous Drain Current漏极连续电流	I_D	50	A
Pulsed Drain Current (note 1)漏极脉冲电流	I_{DM}	200	A
Maximum Power Dissipation最大功耗	P_D	50	W
Avalanche Energy, Single Pulsed(note 2)单脉冲雪崩能量	E_{AS}	150	mJ
Thermal Resistance from Junction to Ambient 结环热阻	$R_{\theta JA}$	100	℃/W
Thermal Resistance from Junction to Case (note 2)结壳热阻	$R_{\theta Jc}$	2.1	℃/W
Maximum Junction Temperature最大结温	T_J	150	℃
Junction and Storage Temperature存储温度	T_{STG}	-50~+150	℃

Electrical Characteristics (Ratings at 25℃ ambient temperature unless otherwise specified).

电特性 (TA = 25℃ 除非另有规定)

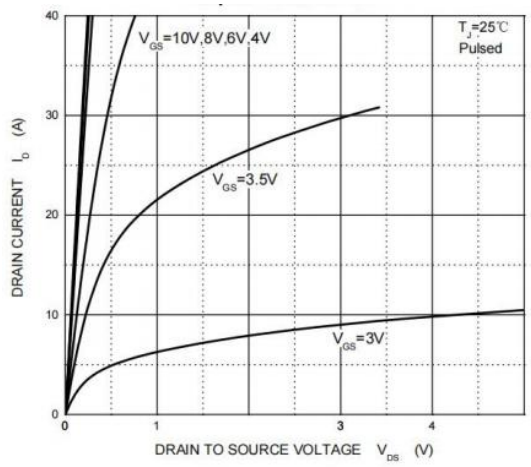
Parameters 参数	Symbol 符号	Test Condition 测试条件	Min 最小值	Typ 典型值	Max 最大值	Unit 单位
Static Characteristics静态特性						
Drain-source breakdown voltage 漏源击穿电压	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	40	--	--	V
Zero gate voltage drain current 零栅压漏极电流	I_{DSS}	V_{DS} =40V,V_{GS} = 0V	--	--	1	μA
Gate-body leakage current栅源漏电流	I_{GSS}	V_{GS} = ± 20V, V_{DS} = 0V	--	--	±100	nA
Gate threshold voltage栅源阈值电压	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D = 250μA	1.0	1.5	2.5	V
Drain-source on-resistance (note 3) 漏源极导通电阻	$R_{DS(on)}$	V_{GS} = 10V, I_D = 10A	--	7.0	9.5	mΩ
		V_{GS} = 4.5V, I_D = 10A	--	10	16	mΩ
Diode forward voltage (note 3) 二极管正向电压	V_{SD}	I_S=20A, V_{GS} = 0V	--	0.8	1.2	V
Dynamic Characteristics动态特性						
Input Capacitance输入电容	Ciss	V_{DS}= 25V,V_{GS}=0V, f =1MHz		1800		pF
Output Capacitance输出电容	Coss			165		pF
Reverse Transfer Capacitance 反向传输电容	Crss			145		pF
Gate Resistance栅极电阻	R_g	f=1MHz		2.5		Ω
Total Gate Charge总栅极电荷	Q_g	V_{DS}= 25V,I_D=30A, V_{GS}=10V		41		nC
Gate-Source Charge栅源电荷	Qgs			4.5		nC
Gate-Drain Charge栅漏电荷	Qgd			10.2		nC
Switching Characteristics开关特性						
Turn-on delay time开启延迟时间	td(on)	V_{DD}= 15V,I_D=30A,R_G= 3Ω, V_{GS}= 10V	--	18	--	ns
Turn-on rise time开启上升沿时间	tr		--	37	--	ns
Turn-off delay time关断延迟时间	td(off)		--	51	--	ns
Turn-off fall time关断下降沿时间	tf		--	15	--	ns

***Notes :**

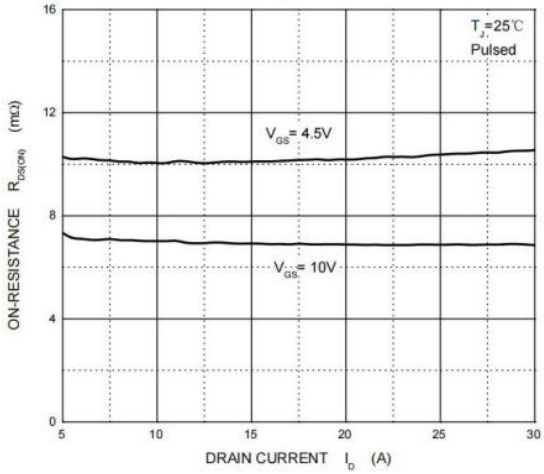
1. Pulse width limited by maximum allowable junction temperature.
2. Limited by TJmax, Part not recommended for use above this value.
3. Pulse test : Pulse width≤300μs, duty cycle≤2%.

Typical characteristics典型特性曲线

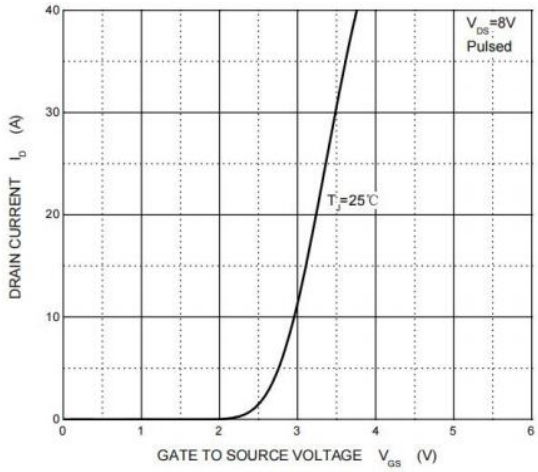
Output Characheristice



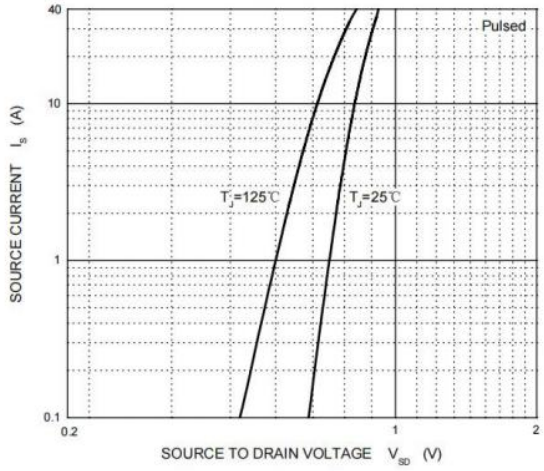
$R_{DS(ON)}$ - I_D



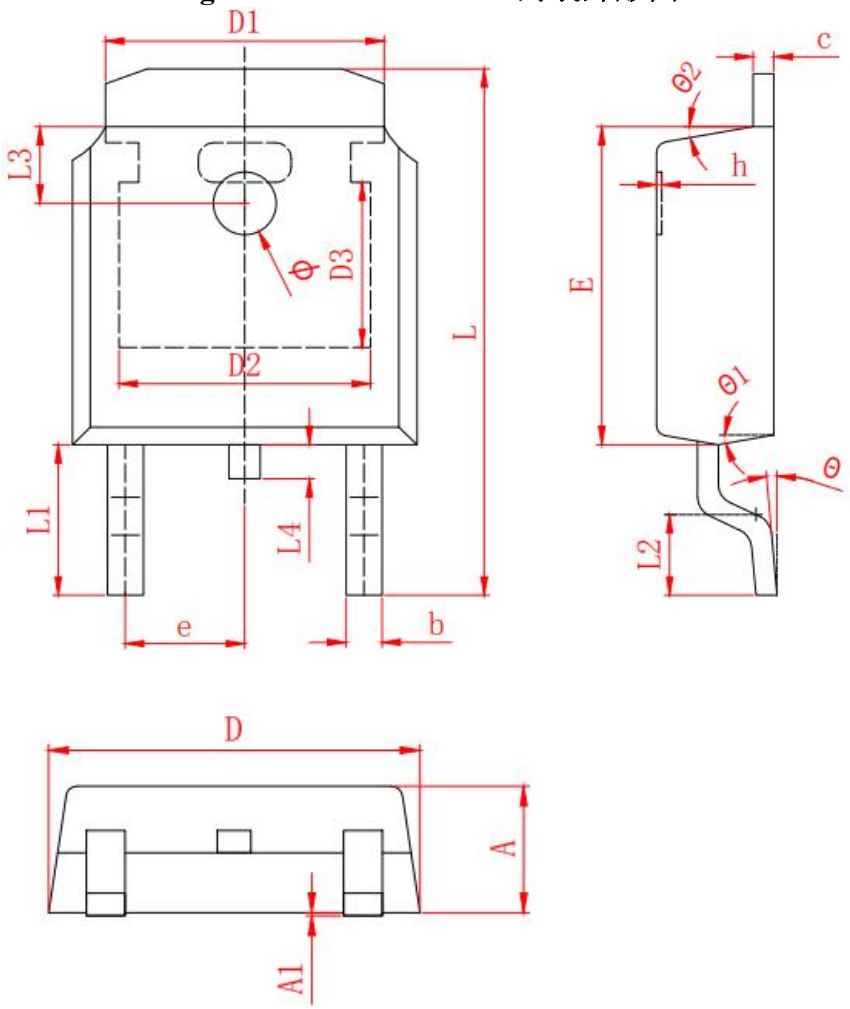
Transfer Characteristics



I_S - V_{SD}



TO-252 Package Outline Dimensions 封装外形图



SYMBOL	MILLIMETER		SYMBOL	MILLIMETER	
	MIN	MAX		MIN	MAX
A	2.200	2.400	h	0.000	0.200
A1	0.000	0.127	L	9.900	10.30
b	0.640	0.740	L1	2.888 REF	
c	0.460	0.580	L2	1.400	1.700
D	6.500	6.700	L3	1.600 REF	
D1	5.334 REF		L4	0.600	1.000
D2	4.826 REF		ϕ	1.100	1.300
D3	3.166 REF		θ	0°	8°
E	6.000	6.200	θ1	9° TYP2	
e	2.286 TYP		θ2	9° TYP	