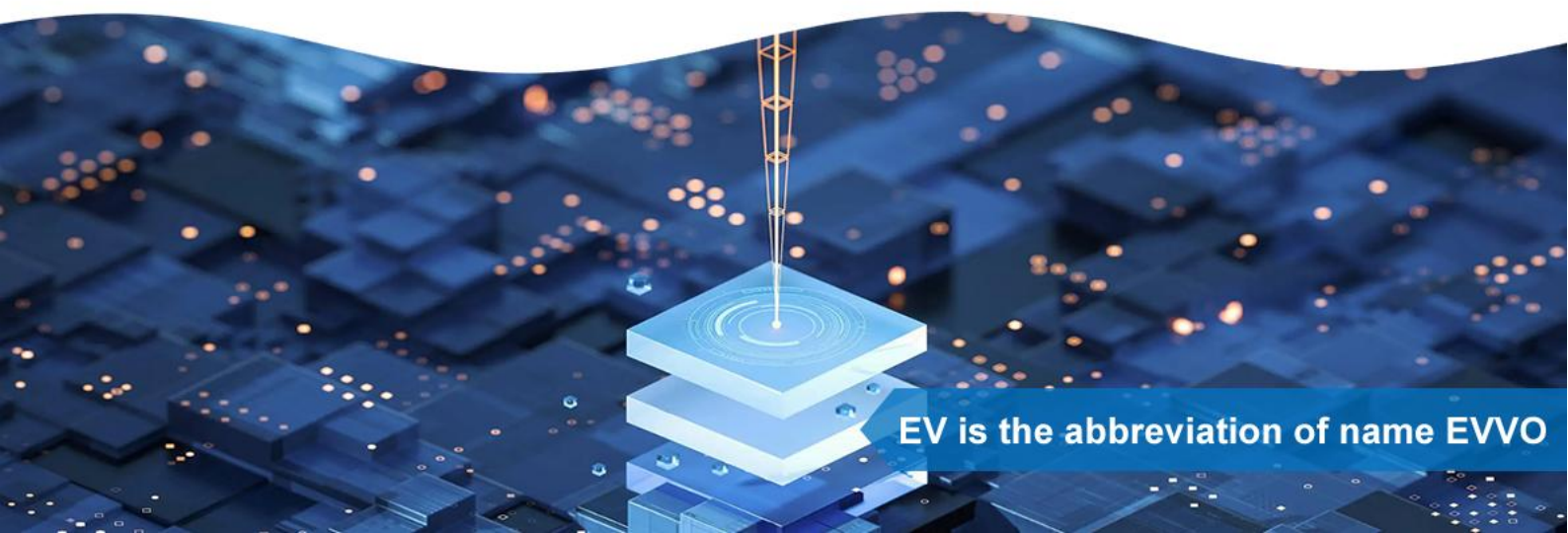
EVVOSEMI®
THINK CHANGE DO

ESD TVS MOS LDO Diode Sensor DC-DC

Product Specification

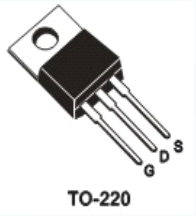
Domestic Part Number	4N65
Overseas Part Number	4N65
Equivalent Part Number	4N65



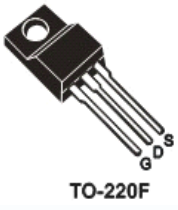
N-沟道功率 MOS 管

Features

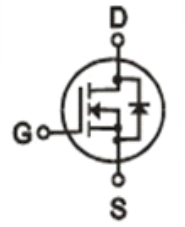
- $V_{DS\ (V)}$=650V
- I_D=4.0A
- $R_{DS(ON)}$ ≤ 2.7 Ω (V_{GS} = 10V)

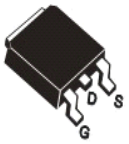


TO-220



TO-220F





TO-252(DPAK)

●最大额定值（Tc=25°C）

●Absolute Maximum Ratings（Tc=25°C） TO-220/220F/TO-252

参数 PARAMETER	符号 SYMBOL	额定值 VALUE	单位 UNIT
- 漏 源电压 Drain-source Voltage	V_{DS}	650	V
- 栅 源电压 gate-source Voltage	V_{GS}	30±	V
漏极电流 Continuous Drain Current TC=25℃	I_D	4.0	A
漏极电流 Continuous Drain Current TC=100℃	I_D	2.5	A
最大脉冲电流 Drain Current －Pulsed ①	I_{DM}	16	A
耗散功率 Power Dissipation	P_{tot}	TO-220:100 TO-220F:33	W
最高结温 Junction Temperature	Tj	150	℃
存储温度 Storage Temperature	T_{STG}	-55-150	℃
单脉冲雪崩能量 Single Pulse Avalanche Energy ②	E_{AS}	128	mJ

N-沟道功率 MOS 管

●电特性（Tc=25 C）

●Electronic Characteristics（Tc=25°C）

参数 PARAMETER	符号 SYMBOL	测试条件 TEST CONDITION	最小值 MIN	典型值 TYP	最大值 MAX	单位 UNIT
- 漏 源击穿电压 Drain-source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	650			V
击穿电压温度系数 Breakdown Voltage Temperature Coefficient	$BV_{\Delta DSS/\Delta Tj}$	I_D=250uA, Referenced to 25°C		0.6		V/°C
栅极开启电压 Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS}=V_{DS}, I_D=250μA	2.0		4.0	V
源漏电流 Drain-source Leakage Current	I_{DSS}	V_{DS} =650V, V_{GS} =0V, Tj=25°C			25	μA
		V_{DS} =520V, V_{GS} =0V, Tj=125°C			250	μA
跨导 Forward Transconductance	gfs	V_{DS} =40V, I_D=2.0A ③		2.5		S

N-沟道功率 MOS 管

参数 PARAMETER	符号 SYMBOL	测试条件 TEST CONDITION	最小值 MIN	典型值 TYP	最大值 MAX	单位 UNIT
栅极漏电流 Gate-body Leakage Current (V_{DS} = 0)	I_{GSS}	V_{GS} =±30V			±100	nA
- 漏 源导通电阻 Static Drain-source On Resistance	$R_{DS(ON)}$	V_{GS} =10V, I_D=2.0A ③		2. 3	2. 7	Ω
输入电容 Input Capacitance	Ciss	V_{GS} = 0V, V_{DS} = 25V F = 1.0MHZ		500		pF
关断延迟 Turn -Off Delay Time	Td(off)	V_{DD}=325V, I_D =4.0A R_G=25Ω ③		40		ns
栅极电荷 Total Gate Charge	Qg	I_D =4.0A, V_{DS} =520V V_{GS} = 10V ③		15.8		nC
栅源电荷 Gate-to-Source Charge	Qgs			3.5		nC
栅漏电荷 Gate-to-Drain Charge	Qgd			6.0		nC
二极管正向电流 Continuous Diode Forward Current	I_S				4.0	A
二极管正向压降 Diode Forward Voltage	V_{SD}	Tj=25°C, Is=4.0A V_{GS} =0V ③			1.4	V
反向恢复时间 Reverse Recovery Time	trr	Tj=25°C, If=4.0A di/dt=100A/μs ③		390		ns
反向恢复电荷 Reverse Recovery Charge	Qrr			1.5		uC

●热特性

●Thermal Characteristics

参数 PARAMETER	符号 SYMBOL	最大值 MAX			单位 UNIT
		TO-220	TO-220F		
热阻结-壳 Thermal Resistance Junction-case	Rth_{JC}	1.25	3.79		/W℃
- 热阻结 环境 Thermal Resistance Junction-ambient	Rth_{JA}	62.5	62.5		/W℃

注释(Notes):

① 脉冲宽度：以最高结温为限制

Repetitive rating: Pulse width limited by maximum junction temperature

② 初始结温=25°C, V_{DD} =50V, L=25mH, R_G =25Ω, I_{AS}=4.0A

Starting Tj=25°C, V_{DD} =50V, L=25mH, R_G =25Ω, I_{AS}=4.0A

③ 脉冲测试：脉冲宽度 ≤ 300μs ， 占空比≤ 2 %

Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%

● 特性曲线

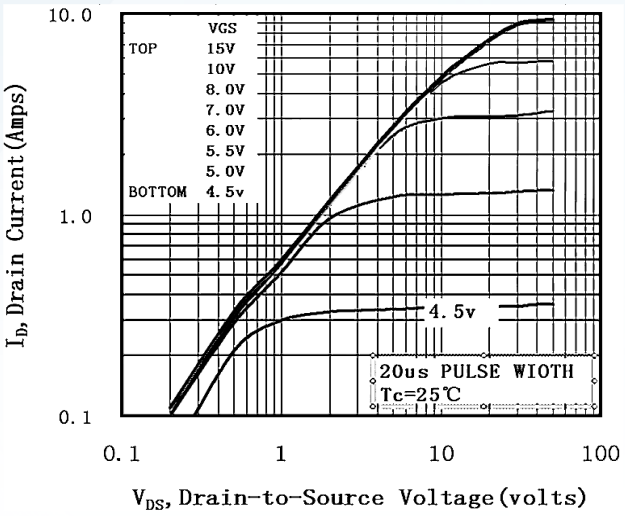


图 1 输出特性曲线, Tc=25℃

Fig1 Typical Output Characteristics, Tc=25℃

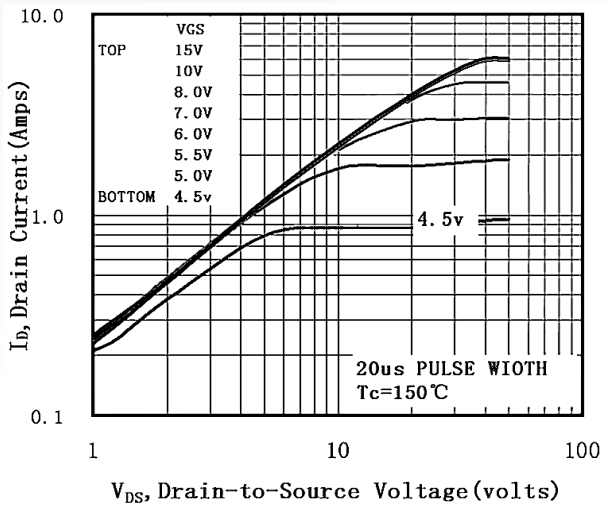


图 2 输出特性曲线, Tc=150℃

Fig2 Typical Output Characteristics, Tc=150℃

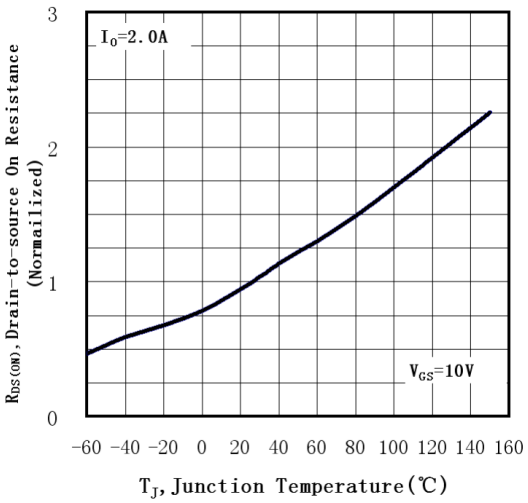


图 3 导通电阻与温度曲线

Fig3 Normalized On-Resistance Vs.Temperature

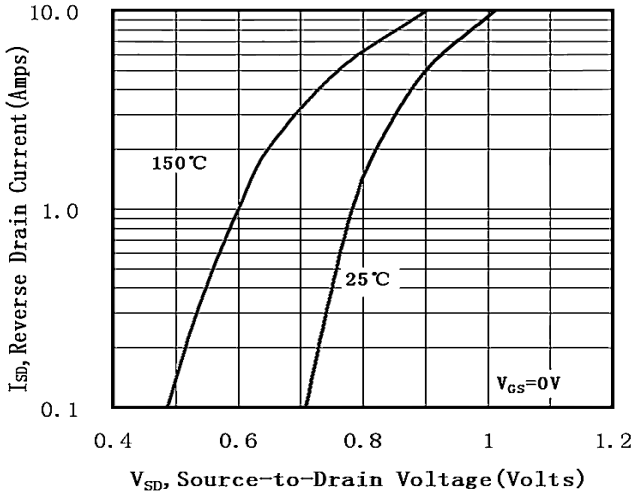


图 4 二极管正向电压曲线

Fig4 Typical Source-Drain Diode Forward Voltage

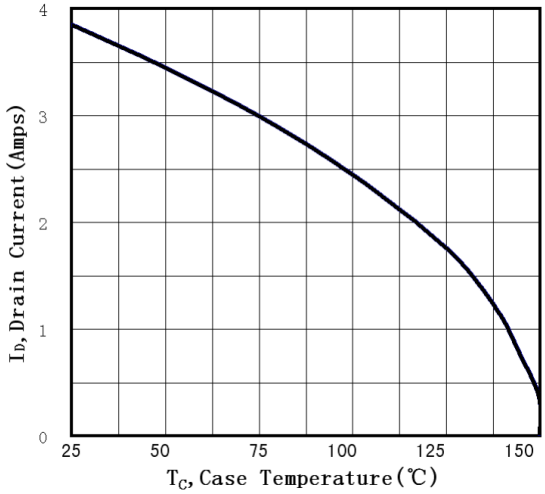


图 5 最大漏极电流与壳温曲线

Fig5 Maximum Drain Current Vs.Case Temperature

● **特性曲线**

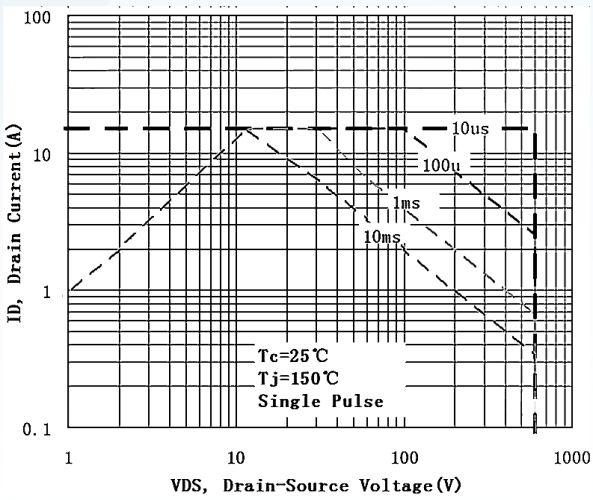


图 6-1 4N65(TO-220)

最大安全工作区曲线

Fig6-1 Maximum Safe Operating Area

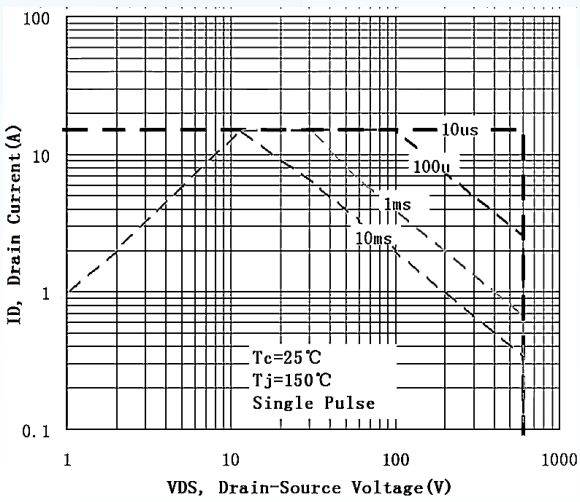


图 6-2 4N65(TO-220F)

最大安全工作区曲线

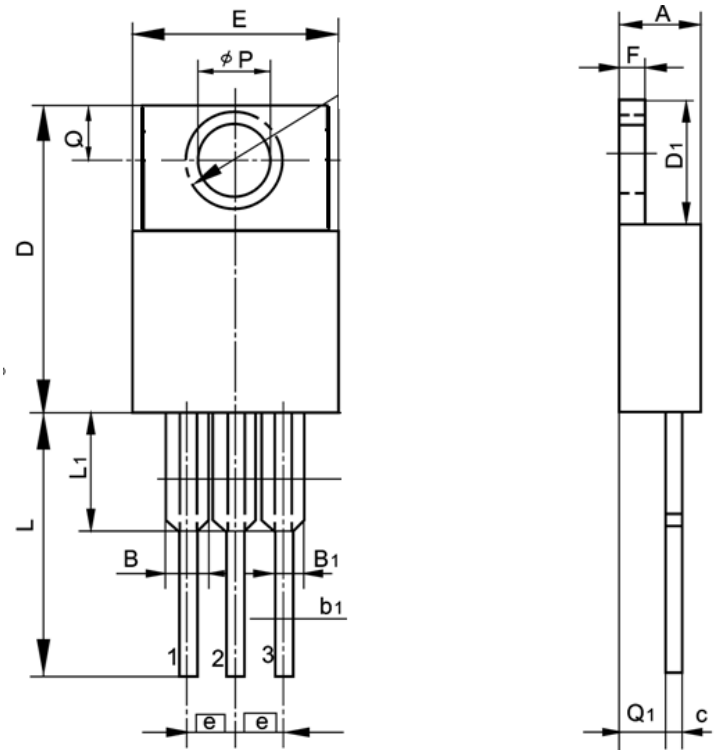
Fig6-2 Maximum Safe Operating Area

N-沟道功率 MOS 管

TO-220 封装

单位：毫米/UNIT：mm

符号 SYMBOL	最小值 min	典型值 nom	最大值 max	符号 SYMBOL	最小值 min	典型值 nom	最大值 max
A	4.00		4.80	E	9.90		10.70
B	1.20		1.50	e		2.54	
B1	1.00		1.40	F	1.10		1.45
b1	0.65		1.00	L	12.50		14.50
c	0.35		0.75	L1	3.00	3.50	4.00
D	15.00		16.50	Q	2.50		3.00
D1	5.90		6.90	Q1	2.00		3.00
				ϕP	3.60		3.90

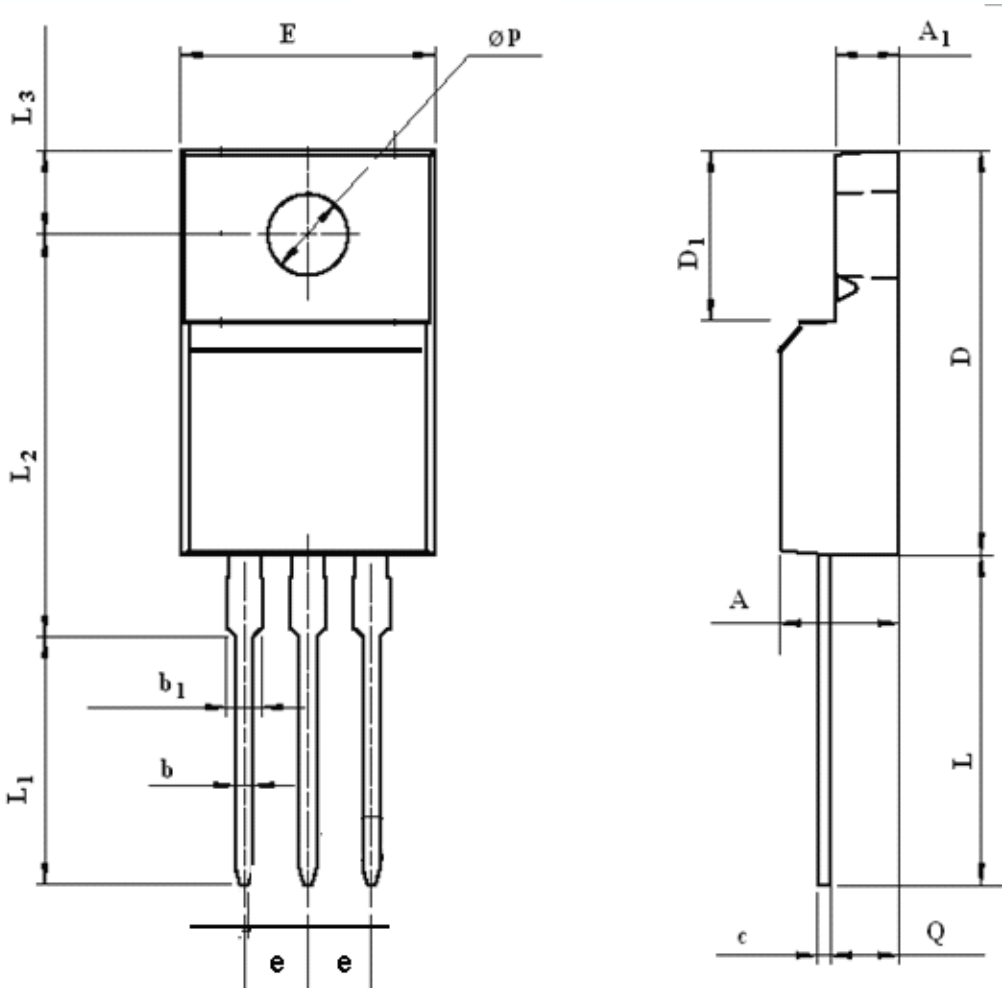


N-沟道功率 MOS 管

TO-220F 封装

单位:毫米/UNIT：mm

符号 SYMBOL	最小值 min	典型值 nom	最大值 max	符号 SYMBOL	最小值 min	典型值 nom	最大值 max
A	**4.40**		**4.95**	e		2.54	
A_1	2.30		2.90	L	12.50		14.30
b	0.45		0.90	L_1	9.10		10.05
b_1	1.10		1.70	L_2	15.00		16.00
c	0.35		0.90	L_3	3.00		4.00
D	14.50		17.00	øp	3.00		3.50
D1	6.10		9.00	Q	2.30		2.80
E	9.60		10.30				

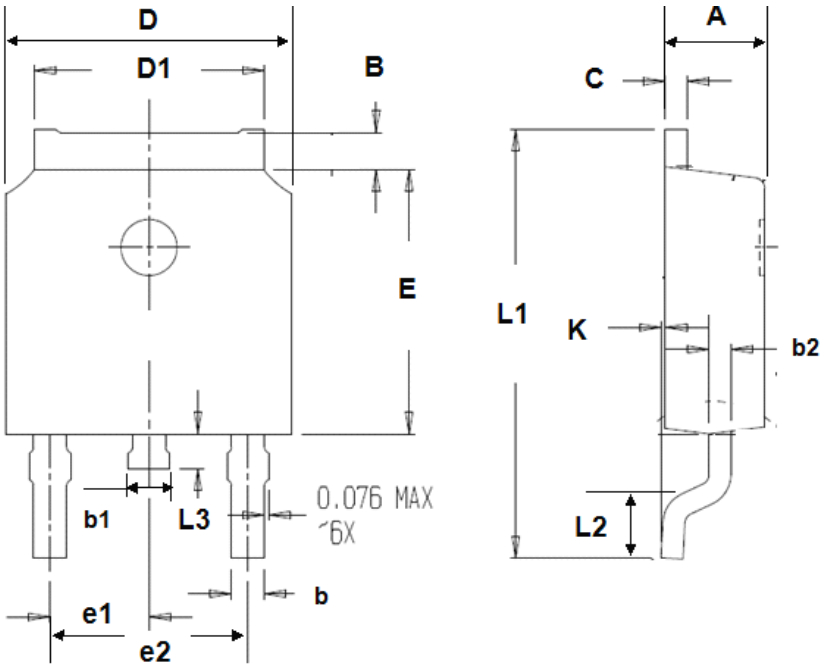


N-沟道功率 MOS 管

TO-252 封装机械尺寸
TO-252 MECHANICAL DATA

单位:毫米/UNIT：mm

符号 SYMBOL	最小值 min	最大值 max	符号 SYMBOL	最小值 min	最大值 max
A	2.10	2.50	B	0.85	1.25
b	0.50	0.80	b1	0.50	0.90
b2	0.45	0.70	C	0.45	0.70
D	6.30	6.75	D1	5.10	5.50
E	5.30	6.30	e1	2.25	2.35
L1	9.20	10.60	e2	4.45	4.75
L2	0.90	1.75	L3	0.60	1.10
K	0.00	0.23			



N-沟道功率 MOS 管

Ordering information

Order code	Package	Baseqty	Deliverymode
4N65L	TO-252	2500	Tape and reel
4N65	TO-220	1000	Tube and box
4N65F	TO-220F	1000	Tube and box

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