

**描述 / Descriptions**

P 沟道 TO-220AB封装场效应管。

P-CHANNEL MOSFET in a TO-220AB Plastic Package

**特征 / Features**

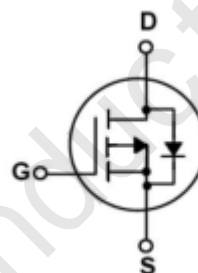
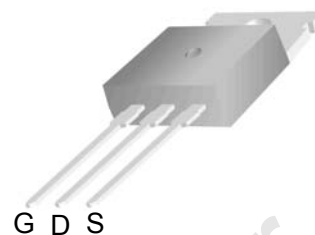
大电流输出能力。无卤产品。

High Current Capability. HF Product.

**用途 / Applications**

交流负载开关, 蓄电池充电/放电保护。

AC-in load switch, Battery protection charge/discharge.


**极限参数 / Absolute Maximum Ratings(Ta=25°C)**

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Drain-Source Voltage	$V_{DSS}$	-60	V
Drain Current	$I_D(T_c=25^\circ\text{C})$	-20	A
Drain Current - Pulsed	$I_{DM}$	-80	A
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Avalanche Current	$I_{AS}$	13.8	A
Avalanche energy L=0.5mH	$E_{AS}$	65	mJ
Power Dissipation	$P_D(T_c=25^\circ\text{C})$	20	W
	$P_D(T_c=100^\circ\text{C})$	10	W
Junction and Storage Temperature Range	$T_j, T_{stg}$	-55~150	$^\circ\text{C}$
Maximum Junction-to-Ambient	$R_{\theta JA}$	$t \leq 10\text{s}$	30
Maximum Junction-to-Ambient		Steady-State	60
Maximum Junction-to-Case	$R_{\theta JC}$	Steady-State	7.5

**电性能参数 / Electrical Characteristics (Ta=25°C)**

参数 Parameter	符号 Symbol	测试条件 Test Conditions	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V$ $I_D=-250\mu A$	-60	-70		V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-60V$ $V_{GS}=0V$			-1.0	$\mu A$
		$V_{DS}=-60V$ $V_{GS}=0V$ $T_J=55^\circ C$			-5.0	$\mu A$
Gate-Body Leakage Current Forward	$I_{GSS}$	$V_{GS}=\pm 20V$ $V_{DS}=0V$			$\pm 0.1$	$\mu A$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	-1	-1.7	-2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)1}$	$V_{GS}=-10V$ $I_D=-20A$		87	92	m $\Omega$
	$R_{DS(on)2}$	$V_{GS}=-4.5V$ $I_D=-10A$		98	102	m $\Omega$
Diode Forward Voltage	$V_{SD}$	$I_S=-1A$ $V_{GS}=0V$		-0.7	-1.2	V

参数 Parameter	符号 Symbol	测试条件 Test Conditions	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
Input Capacitance	$C_{iss}$	$V_{DS}=-25V$ $V_{GS}=0V$ $f=1.0MHz$		1650		pF
Output Capacitance	$C_{oss}$			330		
Reverse Transfer Capacitance	$C_{rss}$			205		
Gate resistance	$R_g$	$V_{GS}=0V$ $V_{DS}=0V$ $f=1MHz$		6.4		$\Omega$
Total Gate Charge	$Q_g(10V)$	$V_{GS}=-10V$ $V_{DS}=-30V$ $I_D=-12A$		7.5		nC
Total Gate Charge	$Q_g(4.5V)$			3.8		
Gate Source Charge	$Q_{gs}$			1.2		
Gate Drain Charge	$Q_{gd}$			1.9		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=-10V$ $V_{DS}=-30V$ $R_L=2.5\Omega$ $R_{GEN}=3\Omega$		4.2		ns
Turn-On Rise Time	$t_r$			3.4		
Turn-Off Delay Time	$t_{d(off)}$			16		
Turn-Off Fall Time	$t_f$			2		
Body Diode Reverse Recovery Time	$t_{rr}$	$I_F=-12A$ $di/dt=500A/ms$		27		ns
Body Diode Reverse Recovery Charge	$Q_{rr}$	$I_F=-12A$ $di/dt=500A/ms$		30		nC

## 电参数曲线图 / Electrical Characteristic Curve

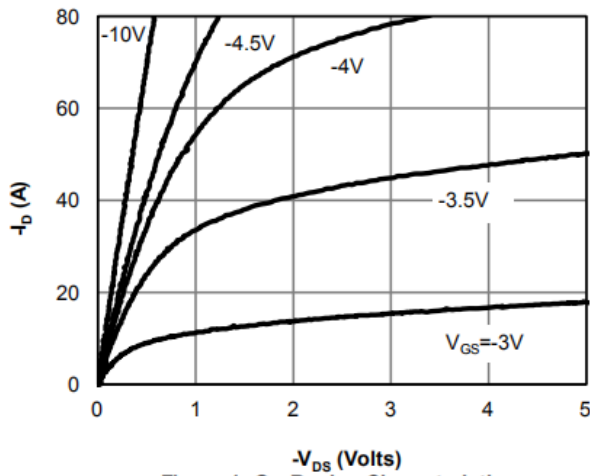


Figure 1: On-Region Characteristics

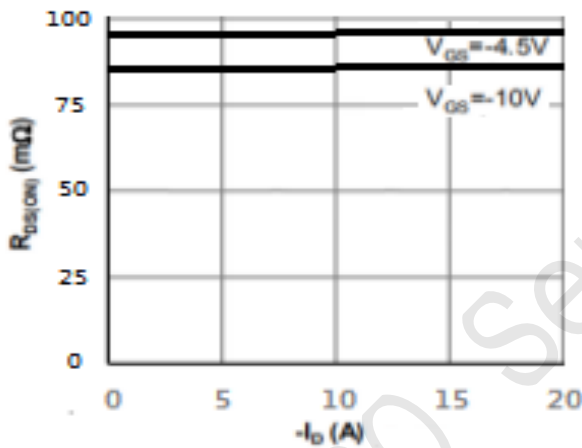
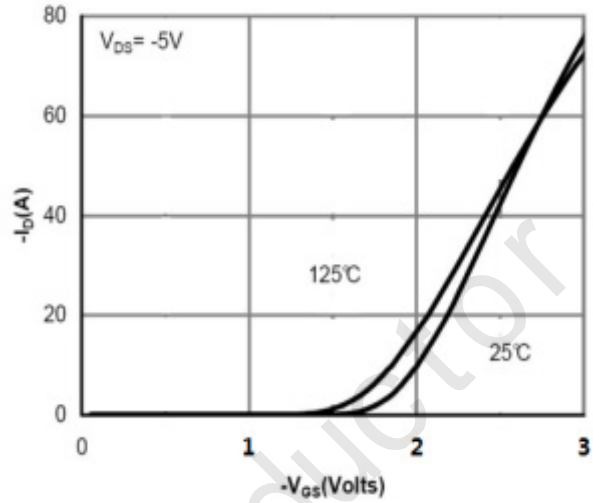


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

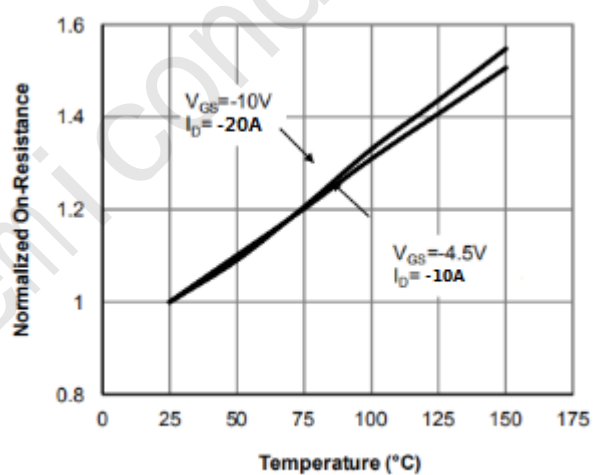


Figure 4: On-Resistance vs. Junction Temperature

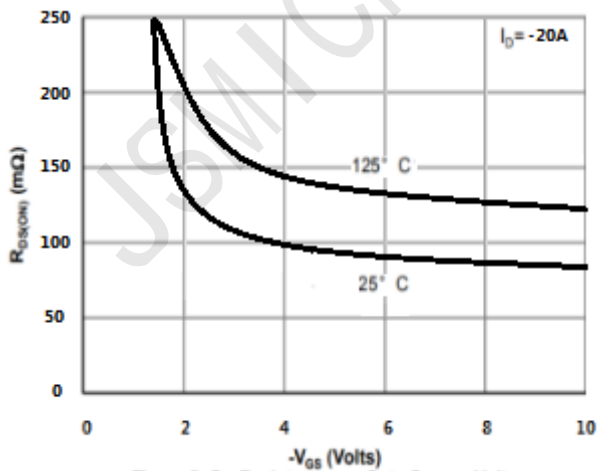


Figure 5: On-Resistance vs. Gate-Source Voltage

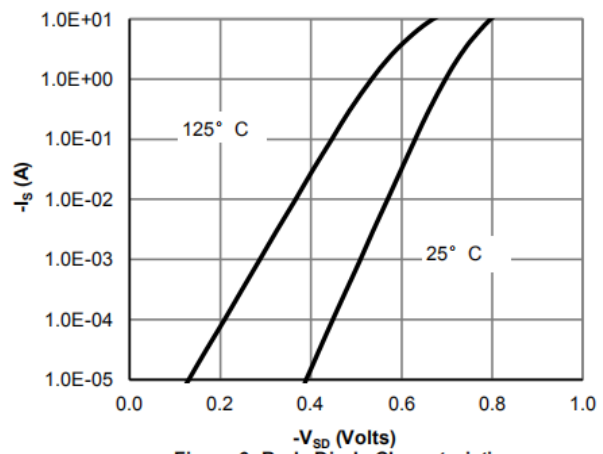


Figure 6: Body-Diode Characteristics

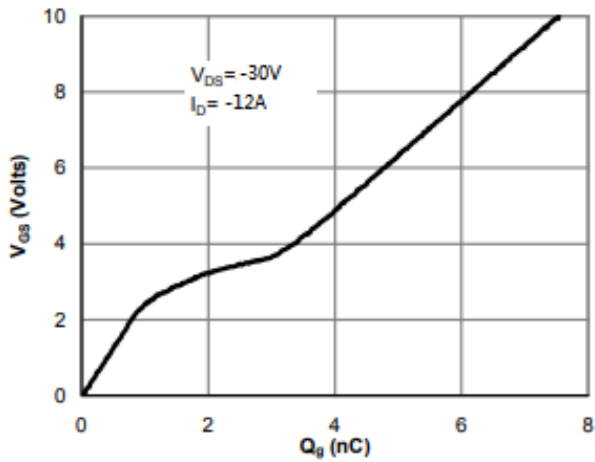


Figure 7: Gate-Charge Characteristics

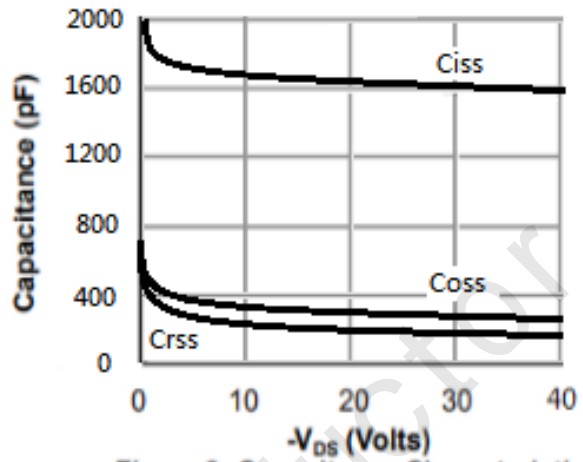


Figure 8: Capacitance Characteristics

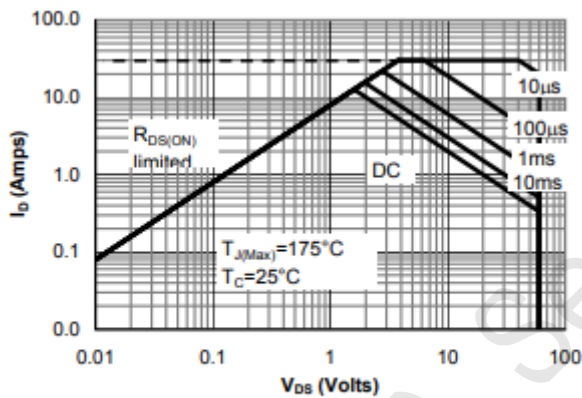


Figure 9: Maximum Forward Biased Safe Operating Area

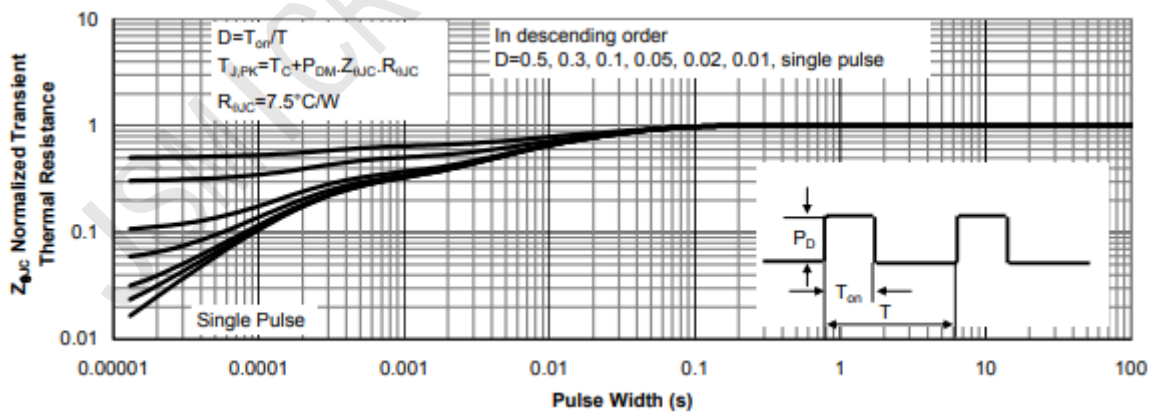
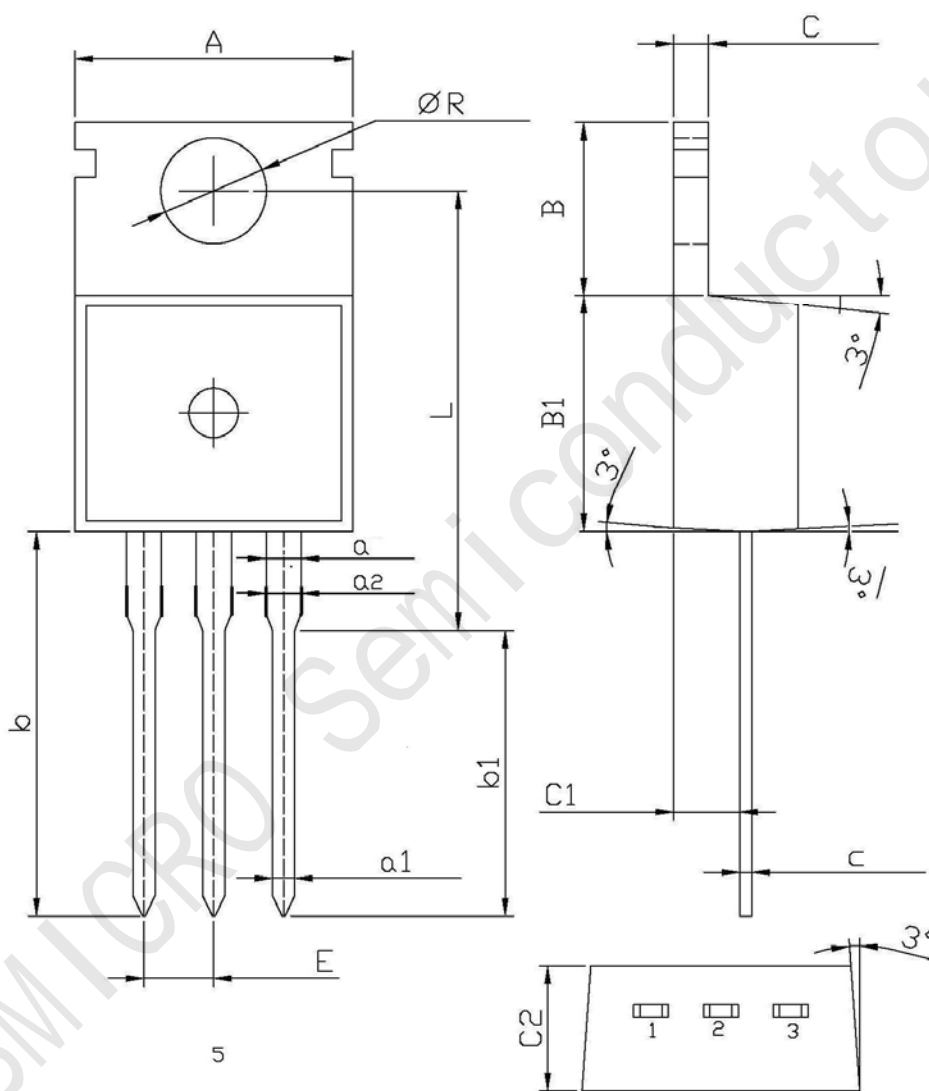


Figure 10 : Normalized Maximum Transient Thermal Impedance

外形尺寸图 / Package Dimensions

TO-220

单位: mm



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	9.8	10.2	C	1.2	1.4
R	3.56	3.64	B	6.3	6.7
L	15.7	16.1	B1	9.0	9.4
b	12.6	13.6	C1	2.2	2.6
b1	9.6	10.6	a1	0.7	0.9
a	1.22	1.32	c	0.4	0.6
E	2.34	2.74	C2	4.3	4.7
Q2	1.25	1.45			

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