

20N50

主要参数 MAIN CHARACTERISTICS

I_D	20 A
V_{DS}	500 V
$R_{ds(on)} (V_{GS}=10V)$	$<0.3\Omega$

用途

- 负载开关
- 脉宽调制
- 电源管理

APPLICATIONS

- Load Switch
- PWM Application
- Power Management

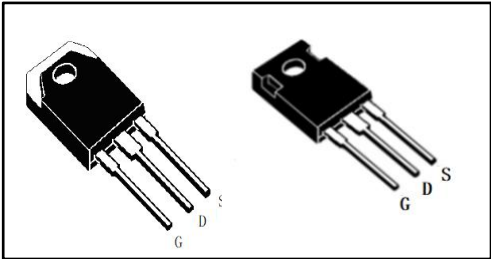
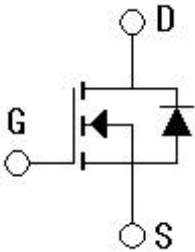
产品特性

- 符合环保标准
- 产品无卤素
- 湿敏等级3级

FEATURES

- RoHS and Reach Compliant
- Halogen and Antimony Free
- Moisture Sensitivity Level 3

封装 Package



产品中有害有害物质或元素的名称及含量

部件名称	有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
	≤0.1%	≤0.1%	≤0.01%	≤0.1%	≤0.1%	≤0.1%
引线框	○	○	○	○	○	○
塑封树脂	○	○	○	○	○	○
管芯	○	○	○	○	○	○
内引线	○	○	○	○	○	○
焊料	×	○	○	○	○	○
说明	○: 表示该元素的含量在 SJ/T11363-2006 标准的限量要求以下。 ×: 表示该元素的含量超出 SJ/T11363-2006 标准的限量要求。 目前产品的焊料中含有铅 (Pb) 成分, 但属于欧盟 RoHS 指令豁免范围。					

绝对最大额定值 **ABSOLUTE RATINGS** ($T_C=25^{\circ}\text{C}$)

项 目 Parameter	符 号 Symbol	数 值 Value	单 位 Unit
最高漏极-源极直流电压 Drain-Source Voltage	V_{DS}	500	V
连续漏极电流 Drain Current-continuous	I_D $T=25^{\circ}\text{C}$	20	A
最大脉冲漏极电流 Drain Current – pulse ^{Note 1}	I_{DM}	80	A
最高栅源电压 Gate-Source Voltage	V_{GS}	± 20	V
单脉冲雪崩能量 Single Pulsed Avalanche Energy Note 2	E_{AS}	960	mJ
耗散功率 Power Dissipation	P_D $T_C=25^{\circ}\text{C}$	350	W
最高结温及存储温度 Operating and Storage Temperature Range	T_J, T_{STG}	$-55\sim+150$	$^{\circ}\text{C}$

电特性 ELECTRICAL CHARACTERISTICS

项 目 Parameter	符 号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最大 Max	单位 Units
关态特性 Off –Characteristics						
漏—源击穿电压 Drain-Source Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V, T_J=25^{\circ}C$	500	-	-	V
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=500V, V_{GS}=0V, T_C=25^{\circ}C$	-	-	100	μA
正向栅极体漏电流 Gate-body leakage current, forward	I_{GSSF}	$V_{DS}=0V, V_{GS}=20V$	-	-	100	nA
反向栅极体漏电流 Gate-body leakage current, reverse	I_{GSSR}	$V_{DS}=0V, V_{GS}=-20V$	-	-	-100	nA
通态特性 On-Characteristics						
阈值电压 Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D=250\mu A$	2.0	-	4.0	V
静态导通电阻 Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=10A$	-	0.28	0.30	Ω
跨导 Forward Transconductance	gfs	$V_{DS}=25V, I_D=10A$	-	30	-	S
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C_{iss}	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$	-	2270	-	pF
输出电容 Output capacitance	C_{oss}		-	282	-	pF
反向传输电容 Reverse transfer capacitance	C_{rss}		-	13	-	pF

电特性 ELECTRICAL CHARACTERISTICS

开关特性 Switching Characteristics							
延迟时间 Turn-On delay time	$t_d(\text{on})$	$V_{DD}=250V, I_D=10A, R_G=25\Omega$ $V_{GS}=10V$	-	35	-	ns	
上升时间 Turn-On rise time	t_r		-	76	-	ns	
延迟时间 Turn-Off delay time	$t_d(\text{off})$		-	96	-	ns	
下降时间 Turn-Off Fall time	t_f		-	86	-	ns	
栅极电荷总量 Total Gate Charge	Q_g	$V_{DS}=250V$, $I_D=10A$ $V_{GS}=10V$	-	46	-	nC	
栅-源电荷 Gate-Source charge	Q_{gs}		-	9	-	nC	
栅-漏电荷 Gate-Drain charge	Q_{gd}		-	20	-	nC	
漏-源二极管特性及最大额定值 Drain-Source Diode Characteristics and Maximum Ratings							
正向最大连续电流 Maximum Continuous Drain -Source Diode Forward Current	I_S		-	-	20	A	
正向压降 Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V$, $I_S=10A$	-	-	1.2	V	
反向恢复时间 Reverse Recovery Time	T_{RR}	$V_{GS}=0V$, $I_S=10A, dI_F/dt=100A/\mu s$	-	550	-	ns	
反向恢复电荷 Reverse Recovery Charge	Q_{RR}		-	5.8	-	μC	

热特性 THERMAL CHARACTERISTIC

项 目 Parameter	符号 Symbol	值 Value	单位 Unit
结到管壳的热阻 Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.54	$^{\circ}C/W$
结到环境的热阻 Thermal Resistance, Junction-to-Ambient	$R_{th(j-A)}$	62.5	$^{\circ}C/W$

NOTES:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $L = 5mH$, $V_{DD} = 30V$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}C$
3. Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 1\%$

特征曲线 ELECTRICAL CHARACTERISTICS

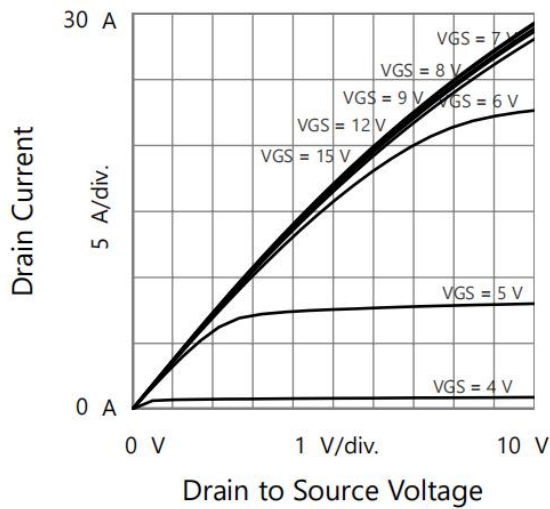
Figure 1. Output Characteristics ($T_J = 25^\circ\text{C}$)

Figure 2. Transfer Characteristics

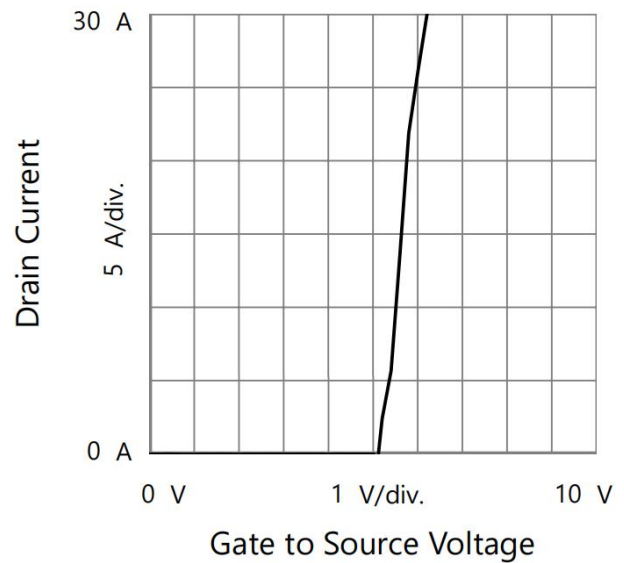


Figure 3. Drain to Source Resistance vs. Drain Current

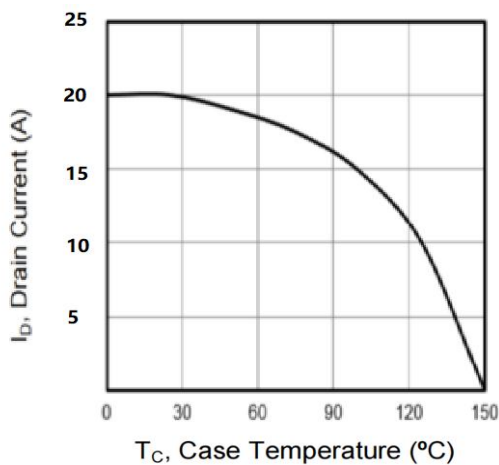


Figure 4. BVDSS Variation vs. Temperature

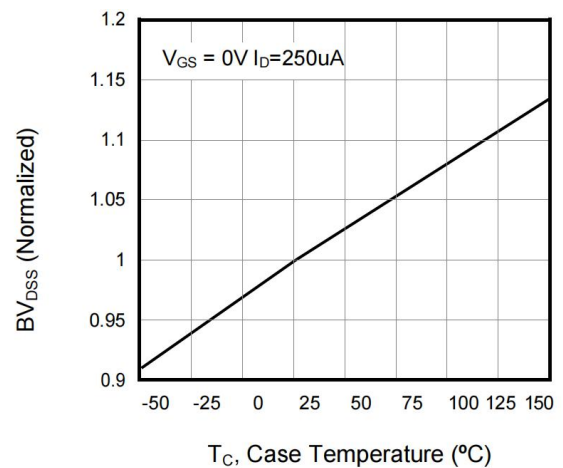


Figure 5. Drain to Source Voltage vs. Gate to Source Voltage

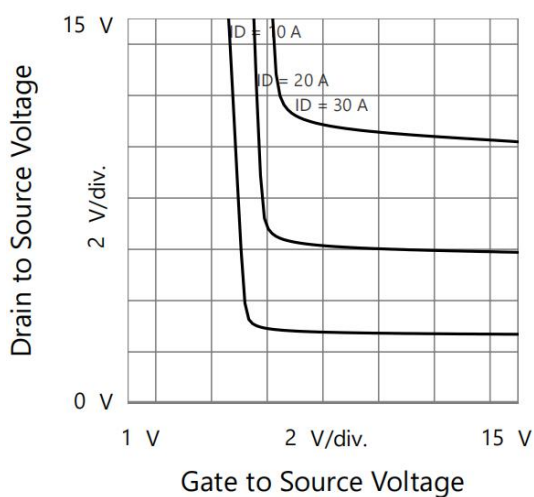
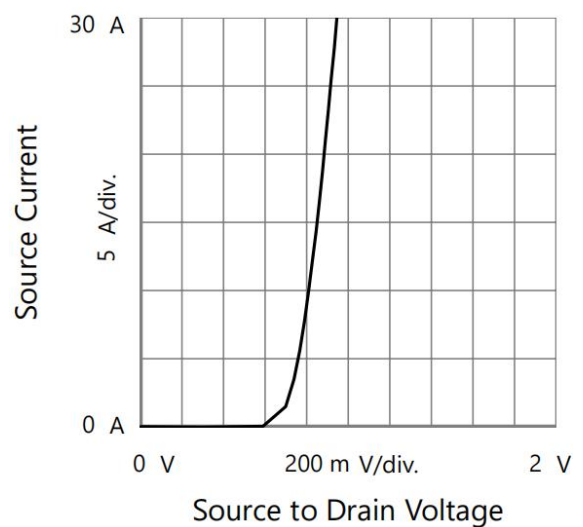


Figure 6. Body Diode Forward Characteristics



特征曲线 ELECTRICAL CHARACTERISTICS

Figure 7. Capacitance

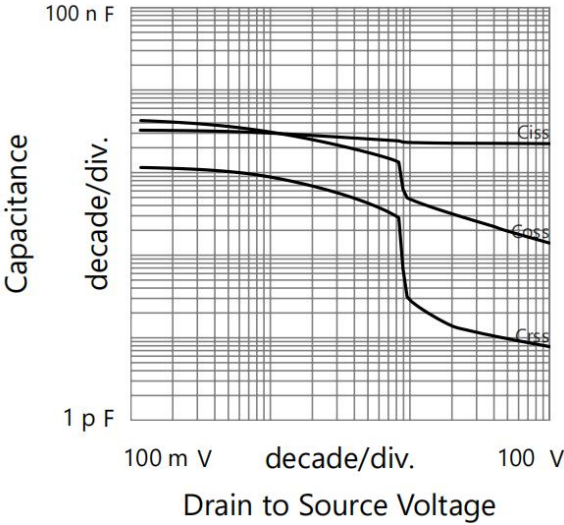


Figure 8. Gate Charge

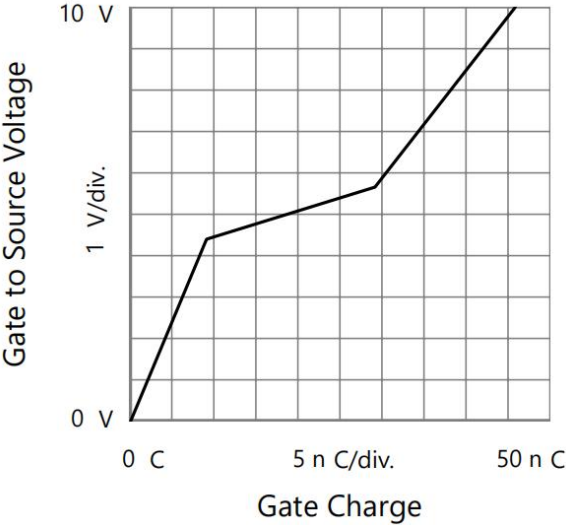
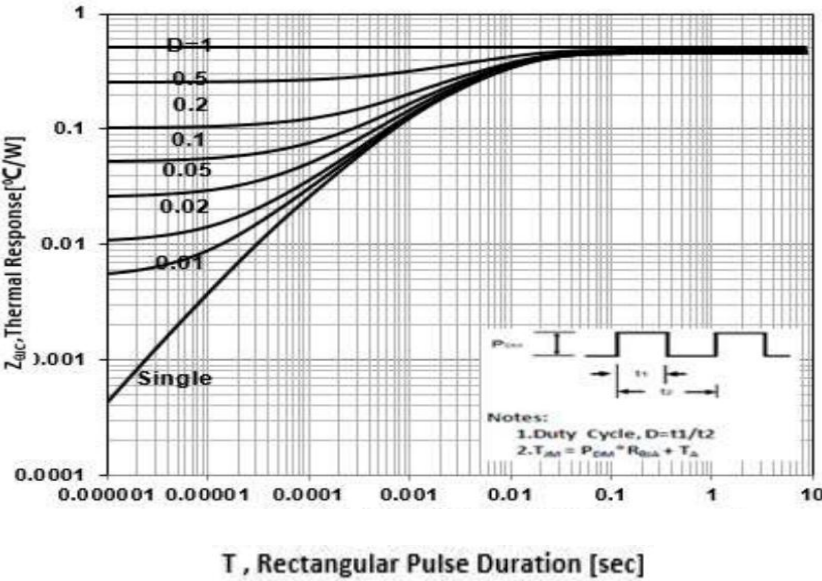
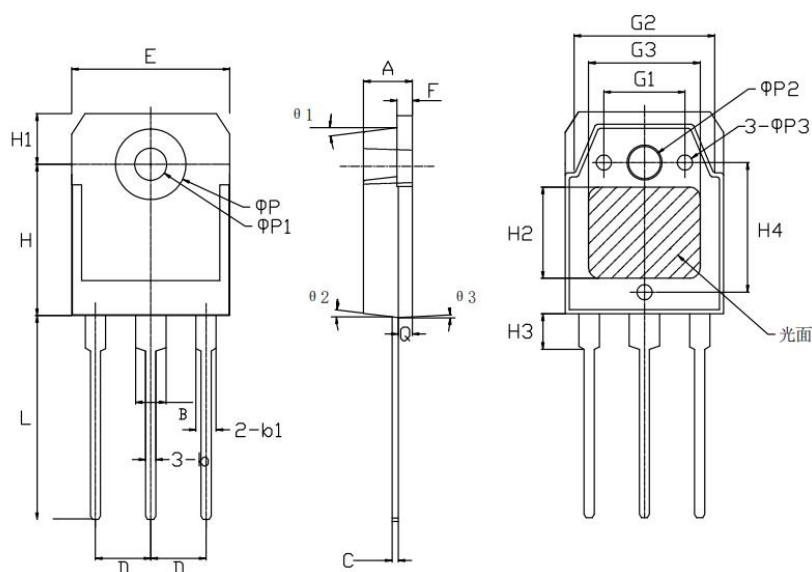


Figure 9. Transient Thermal Impedance



外形尺寸 PACKAGE MECHANICAL DATA

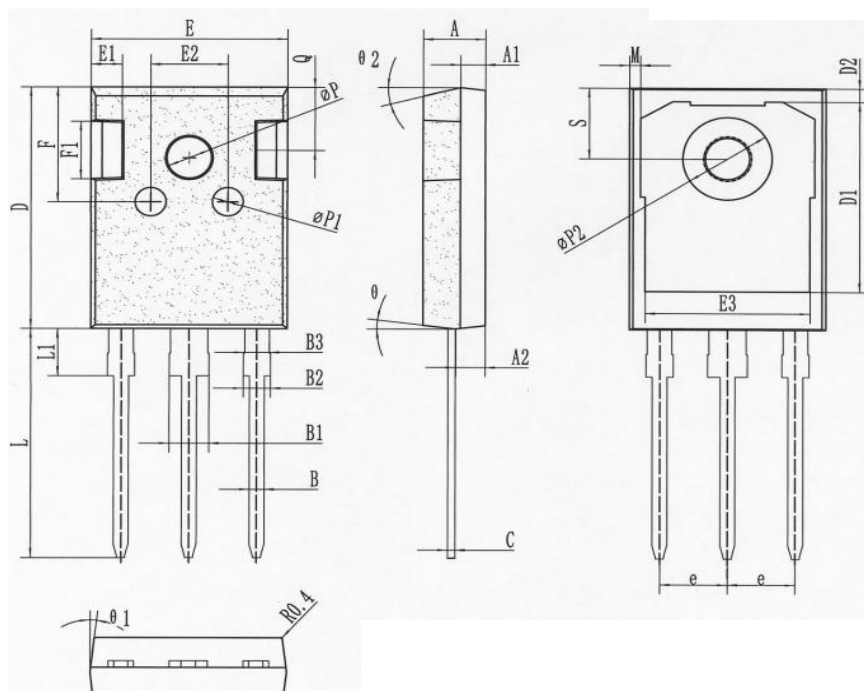
TO-3P



COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
A	4.75	4.80	4.85
B	3.00	3.10	3.20
C	0.55	0.60	0.65
D	5.35	5.45	5.55
E	15.55	15.75	15.95
F	1.40	1.50	1.60
G1	7.90	8.00	8.10
G2	13.20	13.40	13.60
G3	10.90	11.00	11.10
b	0.85	1.00	1.15
b1	1.95	2.05	2.15
L	20.00	20.15	20.30
H	14.80	14.90	15.00
H1	4.90	5.00	5.10
H2	8.90	9.00	9.10
H3	3.20	3.50	3.80
H4	12.66	12.76	12.86
ΦP	6.90	7.00	7.10
ΦP1	3.10	3.20	3.30
ΦP2	3.40	3.50	3.60
ΦP3	1.40	1.50	1.60
θ1	6°	7°	8°
θ2	6°	7°	8°
θ3	2°	3°	4°
Q	1.33	1.38	1.43

TO-247



SYMBOL	MM		
	MIN	NOM	MAX
A	4.90	5.00	5.10
A1	1.90	2.00	2.10
A2	2.30	2.40	2.50
B	1.15	1.20	1.25
B1	3.05	3.15	3.25
B2	2.00	2.10	2.20
B3	1.90	2.00	2.10
C	0.55	0.60	0.65
D	20.90	21.00	21.10
D1	16.35	16.55	16.75
D2	1.02	1.17	1.32
E	15.70	15.80	15.90
E1	2.40	2.50	2.60
E2	6.10	6.20	6.30
E3	13.10	13.30	13.50
F	9.80	10.00	10.20
F1	4.90	5.00	5.10
e	5.44 BSC		
L	19.72	19.92	20.12
L1	3.90	4.10	4.30
ΦP	3.50	3.60	3.70
ΦP1	2.40	2.50	2.60
ΦP2	7.10	7.20	7.30
S	6.05	6.15	6.25
M	0.45	—	0.95
Q	5.60	5.80	6.00
θ	5°	7°	9°
θ1	5°	7°	9°
θ2	13°	15°	17°