

## P-Channel Enhancement Mode Field Effect Transistor

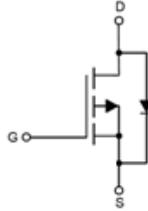


Top View



Bottom View

DFN1006-3L



### Product Summary

- $V_{DS}$  -60V
- $I_D$  -0.22A
- $R_{DS(ON)}$ ( at  $V_{GS}=-10V$ )  $< 5\Omega$
- $R_{DS(ON)}$ ( at  $V_{GS}=-5V$ )  $< 6\Omega$
- ESD Level(HBM) H0

### General Description

- Low  $R_{DS(ON)}$
- Low gate charge
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

### Applications

- Video monitor
- Power management

### Limiting Values

Parameter	Conditions		Symbol	Min	Max	Unit
Drain-source Voltage			$V_{DS}$	-	-60	V
Gate-source Voltage			$V_{GS}$	-20	20	
Continuous Drain Current (Note 1,2)	Steady-State	$T_A=25^\circ\text{C}, V_{GS}=-10V$	$I_D$	-	-0.22	A
		$T_A=100^\circ\text{C}, V_{GS}=-10V$		-	-0.14	
Pulsed Drain Current	$T_A=25^\circ\text{C}, t_p \leq 10\mu\text{s}$		$I_{DM}$	-	-0.88	
Maximum Body-Diode Continuous Current	$T_A=25^\circ\text{C}$		$I_S$		-0.22	
Total Power Dissipation (Note 1,2)	Steady-State	$T_A=25^\circ\text{C}$	$P_D$	-	0.47	W
		$T_A=100^\circ\text{C}$		-	0.18	
Junction and Storage Temperature Range			$T_J, T_{STG}$	-55	150	$^\circ\text{C}$

### Thermal Resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient (Note 2)	Steady-State	$R_{\theta JA}$	-	265	$^\circ\text{C}/\text{W}$



# YJA5K0P06A

## ■ Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A, T_j=25^\circ C$	-60	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-60V, V_{GS}=0V, T_j=25^\circ C$	-	-	-1	$\mu A$
		$V_{DS}=-60V, V_{GS}=0V, T_j=125^\circ C$	-	-	-100	
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V, T_j=25^\circ C$	-	-	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A, T_j=25^\circ C$	-0.9	-1.4	-2	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-0.1A, T_j=25^\circ C$	-	2.8	5	$\Omega$
		$V_{GS}=-5V, I_D=-0.1A, T_j=25^\circ C$	-	3.2	6	$\Omega$
Diode Forward Voltage	$V_{SD}$	$I_S=-0.115A, V_{GS}=0V, T_j=25^\circ C$	-	-0.84	-1.2	V
Gate Resistance	$R_G$	$f=1MHz, T_j=25^\circ C$	-	40	-	$\Omega$
<b>Dynamic Parameters</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-30V, V_{GS}=0V, f=1MHz, T_j=25^\circ C$	-	22.9	-	$\mu F$
Output Capacitance	$C_{oss}$		-	2.9	-	
Reverse Transfer Capacitance	$C_{rss}$		-	1.56	-	
<b>Switching Parameters</b>						
Total Gate Charge	$Q_g$	$V_{GS}=-10V, V_{DS}=-30V, I_D=-0.19A, T_j=25^\circ C$	-	2.7	-	nC
Gate-Source Charge	$Q_{gs}$		-	0.6	-	
Gate-Drain Charge	$Q_{gd}$		-	0.9	-	
Reverse Recovery Charge	$Q_{rr}$	$I_F=-0.19A, di/dt=100A/\mu s, V_{GS}=0V, V_R=-30V, T_j=25^\circ C$	-	4.4	-	nC
Reverse Recovery Time	$t_{rr}$		-	12	-	ns
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=-10V, V_{DS}=-30V, I_D=-0.19A, R_{GEN}=3\Omega, T_j=25^\circ C$	-	4.3	-	ns
Turn-on Rise Time	$t_r$		-	5.8	-	
Turn-off Delay Time	$t_{D(off)}$		-	7	-	
Turn-off Fall Time	$t_f$		-	46.1	-	

### Note:

- The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
- The value of  $R_{\theta JA}$  is measured with the device mounted on the 40mm\*40mm\*1.1mm single layer FR-4 PCB board with 1 in<sup>2</sup> pad of 2oz. Copper, in the still air environment with  $T_A=25^\circ C$ . The maximum allowed junction temperature of 150 $^\circ C$ . The value in any given application depends on the user's specific board design.



## Typical Electrical and Thermal Characteristics Diagrams

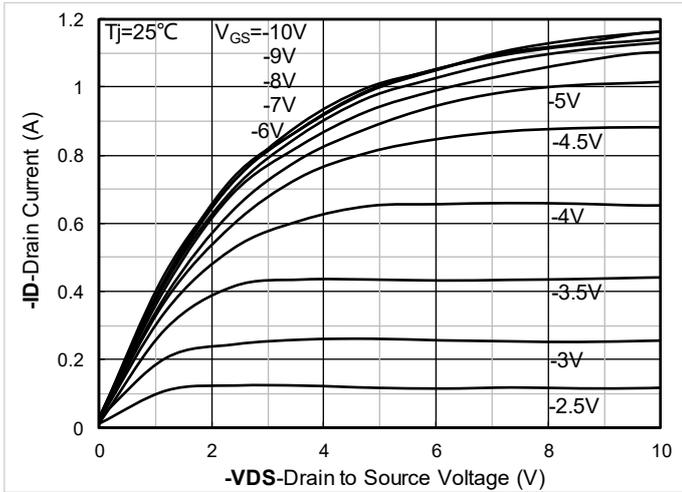


Figure 1. Output Characteristics; typical values

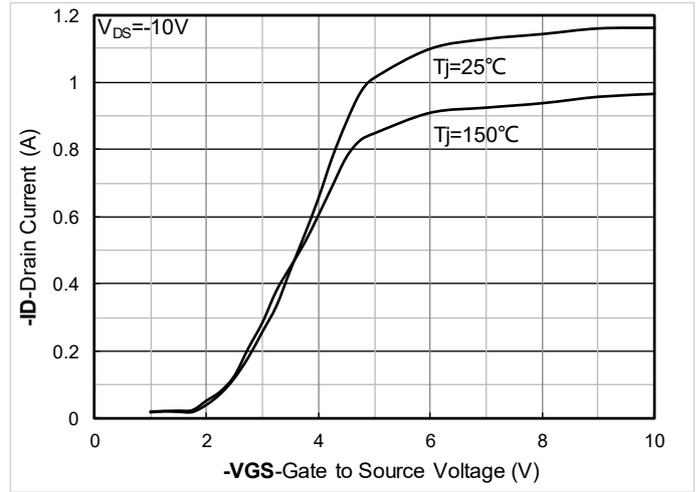


Figure 2. Transfer Characteristics; typical values

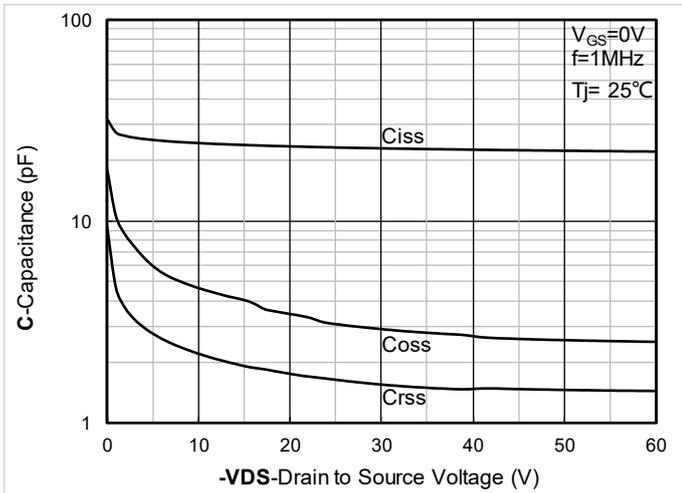


Figure 3. Capacitance Characteristics; typical values

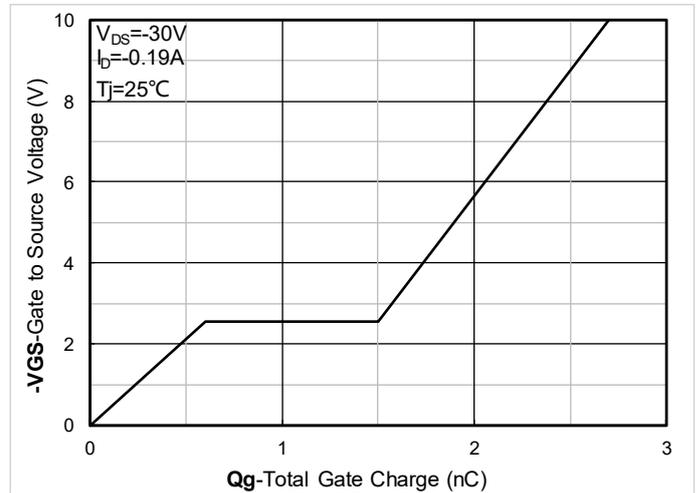


Figure 4. Gate Charge; typical values

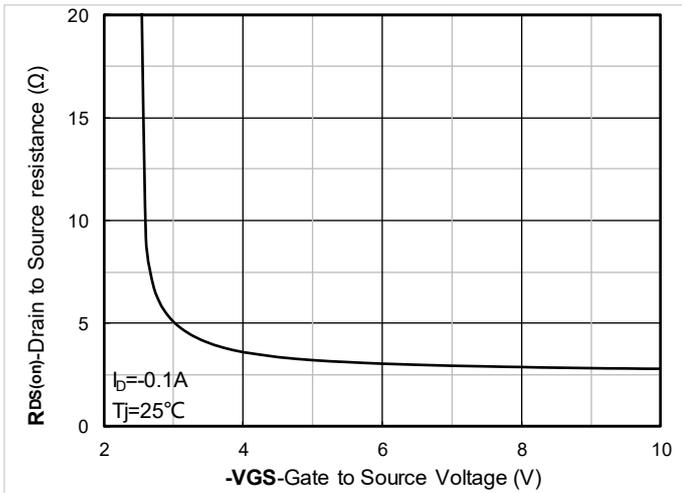


Figure 5. On-Resistance vs Gate to Source Voltage; typical values

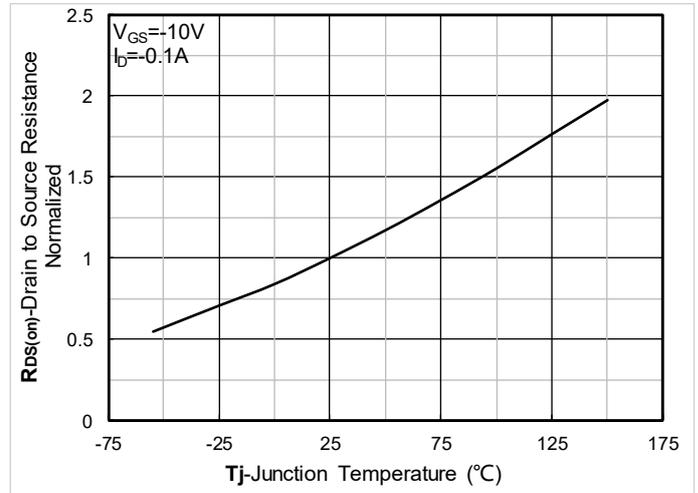


Figure 6. Normalized On-Resistance



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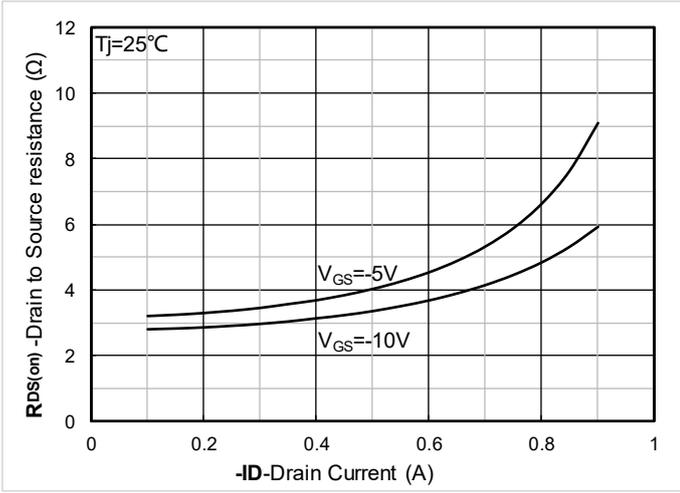


Figure 7. RDS(on) VS Drain Current; typical values

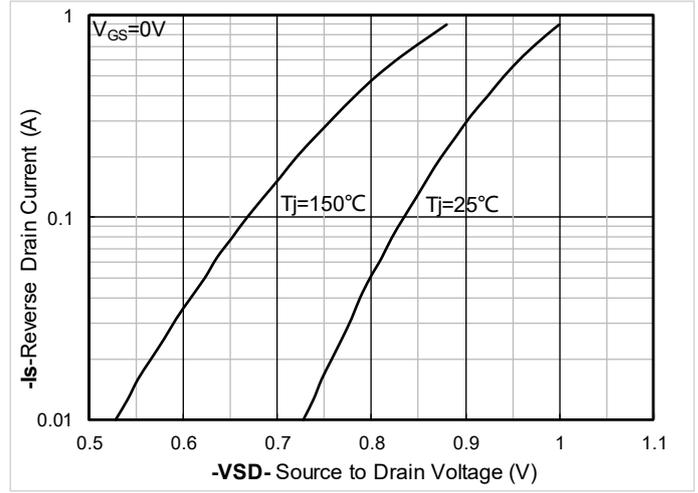


Figure 8. Forward characteristics of reverse diode; typical values

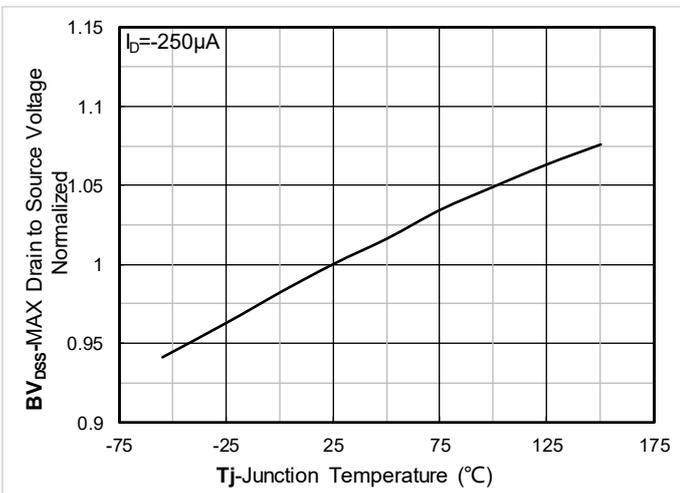


Figure 9. Normalized breakdown voltage

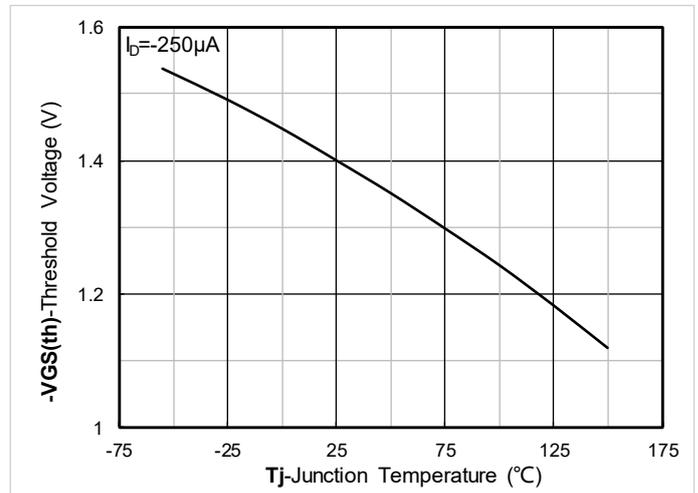


Figure 10. Gate Threshold voltage; typical values

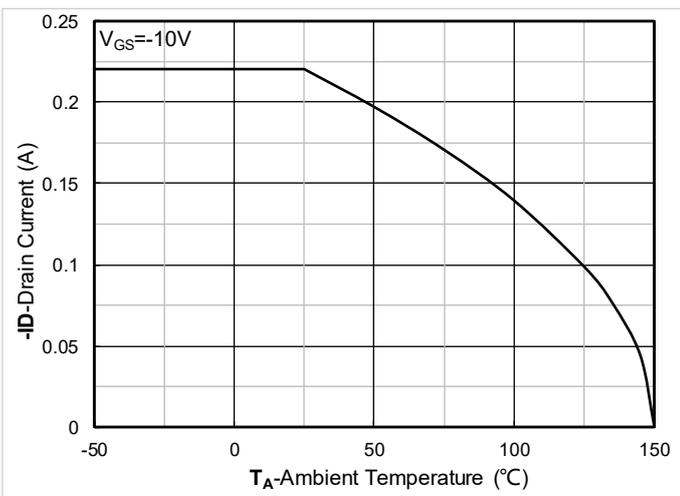


Figure 11. Current dissipation

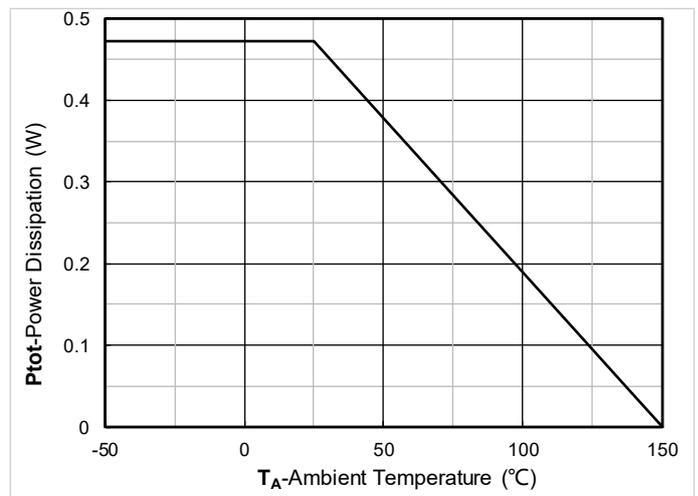


Figure 12. Power dissipation



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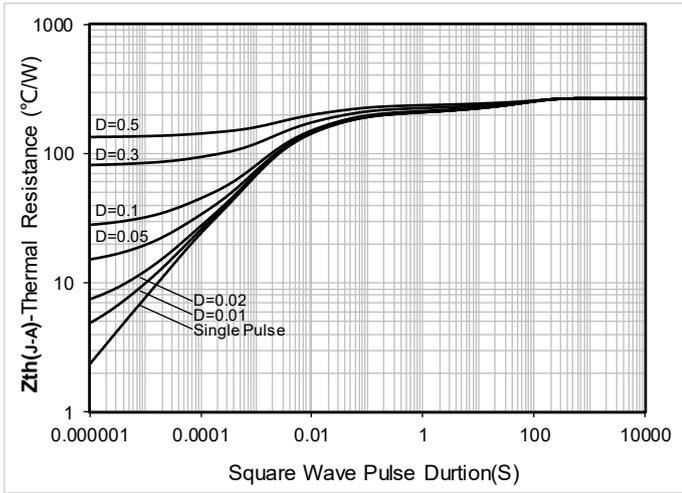


Figure 13. Maximum Transient Thermal Impedance

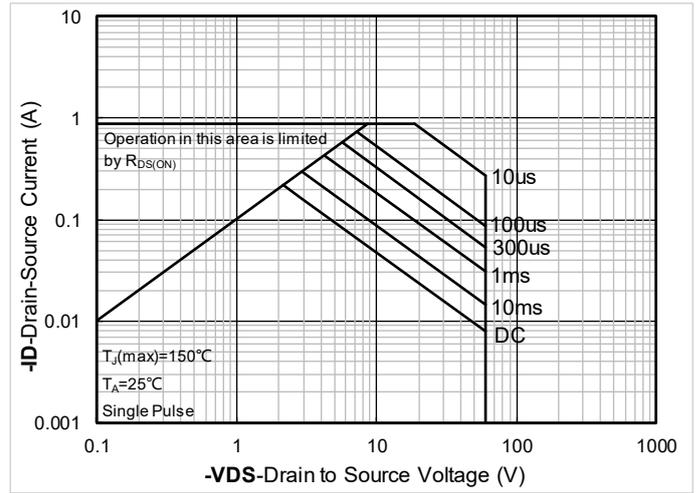
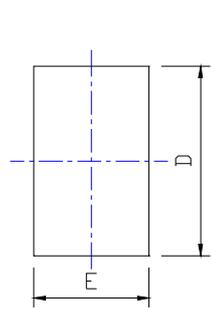


Figure 14. Safe Operation Area

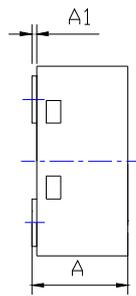


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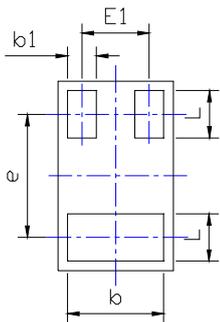
## DFN1006-3L Package information



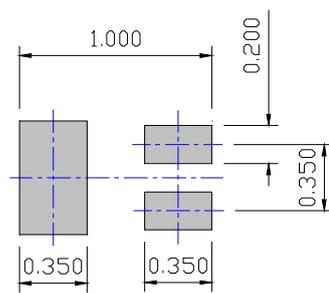
TOP VIEW



SIDE VIEW



BOTTOM VIEW



SUGGESTED SOLDER PAD LAYOUT

UNIT: mm

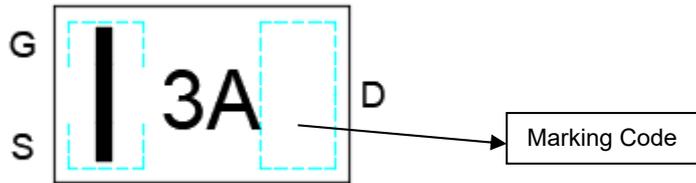
SYMBOL	DIMENSIONS		
	Millimeter		
	MIN.	NOM.	MAX.
A	0.42	---	0.55
A1	0.025REF		
b	0.45	0.50	0.55
b1	0.10	0.15	0.20
D	0.95	1.00	1.05
E	0.55	0.60	0.65
E1	0.35BSC		
e	0.65BSC		
L	0.20	0.25	0.30

### NOTE:

- 1.PACKAGE BODY SIZES EXCLUDE LEAD BURRS.
- 2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
- 3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.



■ Marking Information



Note:

1. All marking is at middle of the product body
2. All marking is in laser printing
3. 3A is marking code
4. Body color: Black



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### Disclaimer

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