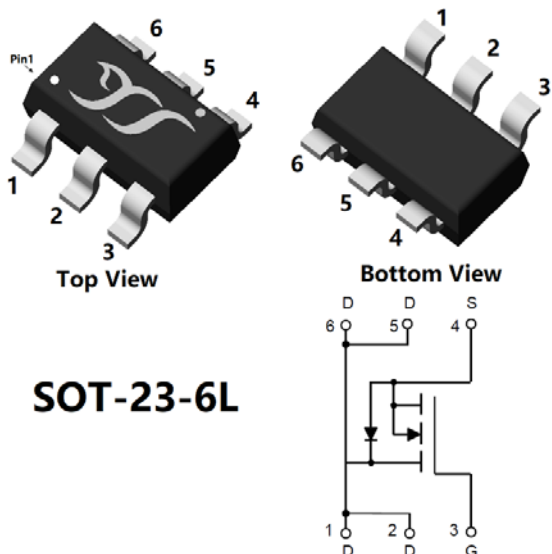


## N-Channel Enhancement Mode Field Effect Transistor



### Product Summary

• $V_{DS}$	60V
• $I_D$	5.0A
• $R_{DS(ON)}$ ( at $V_{GS}=10V$ )	<43m $\Omega$
• $R_{DS(ON)}$ ( at $V_{GS}=4.5V$ )	<47m $\Omega$

### General Description

- Low  $R_{DS(on)}$  & FOM
- Extremely low switching loss
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Part no. with suffix "Q" means AEC-Q101 qualified
- Halogen Free

### Applications

- Power management
- Portable equipment

### ■ Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source Voltage	$V_{DS}$	60	V
Gate-source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current	$I_D$	$T_A=25^\circ\text{C}$	5
		$T_A=100^\circ\text{C}$	3
Pulsed Drain Current <sup>A</sup>	$I_{DM}$	20	A
Total Power Dissipation <sup>C</sup>	$P_D$	$T_A=25^\circ\text{C}$	1.25
		$T_A=100^\circ\text{C}$	0.5
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 <sup>D</sup>	$R_{\theta JA}$	80	100	$^\circ\text{C/W}$

### ■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJJ05N06AQ	F2	0605.	3000	30000	120000	7" reel



# YJJ05N06AQ

## ■ Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	60	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V	-	-	1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V			± 100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.5	2.5	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =5A		27	43	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =4A		30	47	mΩ
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =5A, V <sub>GS</sub> =0V		0.85	1.2	V
Gate resistance	R <sub>G</sub>	f=1MHz	-	10	-	Ω
<b>Dynamic Parameters</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f=1MHz	-	1170	-	pF
Output Capacitance	C <sub>oss</sub>		-	64.4	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	54.9	-	
<b>Switching Parameters</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =30V, I <sub>D</sub> =5A	-	23.4	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	2.1	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	6.1	-	
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =5A, di/dt=100A/us	-	44.7	-	nC
Reverse Recovery Time	t <sub>rr</sub>		-	19.0	-	ns
Turn-on Delay Time	t <sub>D(on)</sub>	V <sub>GS</sub> =10V, V <sub>DD</sub> =30V, I <sub>D</sub> =5A R <sub>GEN</sub> =3Ω	-	3.0	-	ns
Turn-on Rise Time	t <sub>r</sub>		-	28.2	-	
Turn-off Delay Time	t <sub>D(off)</sub>		-	25.6	-	
Turn-off fall Time	t <sub>f</sub>		-	2.53	-	

A. Repetitive rating; pulse width limited by max. junction temperature.

B. P<sub>d</sub> is based on max. junction temperature, using junction-case and junction-ambient thermal resistance.

C. The value of R<sub>θJA</sub> is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in the still air environment with T<sub>A</sub> =25°C. The maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.



# YJJ05N06AQ

## Typical Electrical and Thermal Characteristics Diagrams

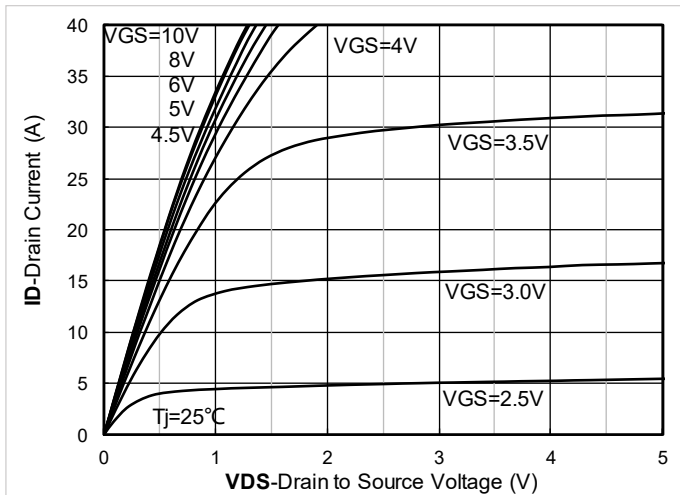


Figure 1. Output Characteristics

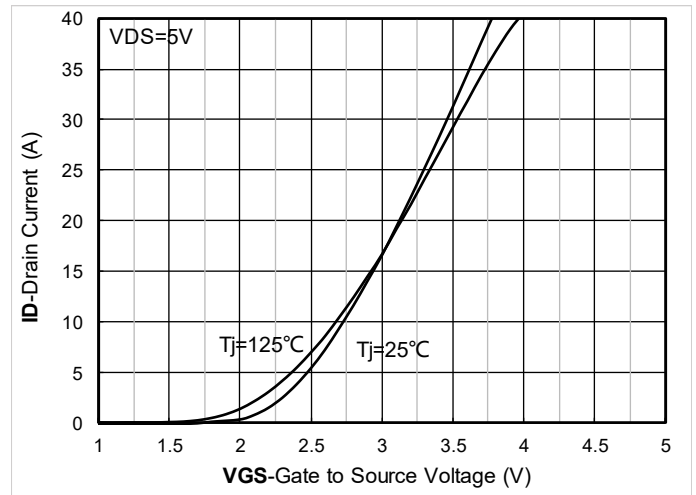


Figure 2. Transfer Characteristics

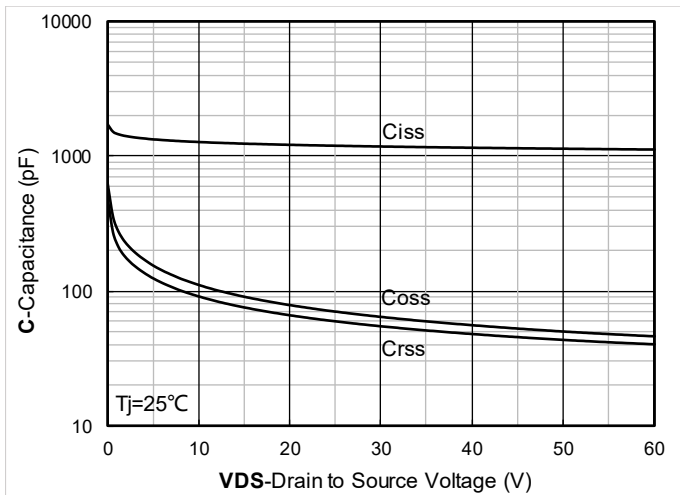


Figure 3. Capacitance Characteristics

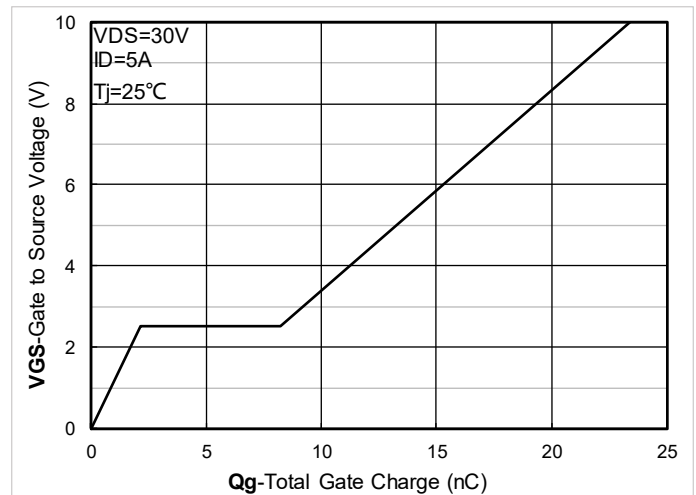


Figure 4. Gate Charge

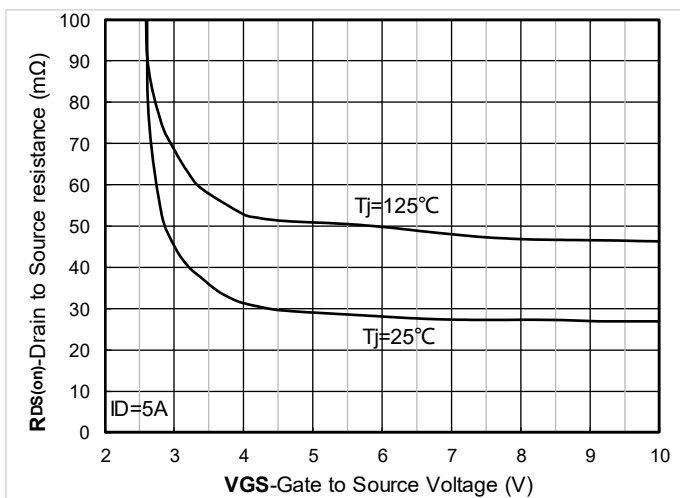


Figure 5. On-Resistance vs Gate to Source Voltage

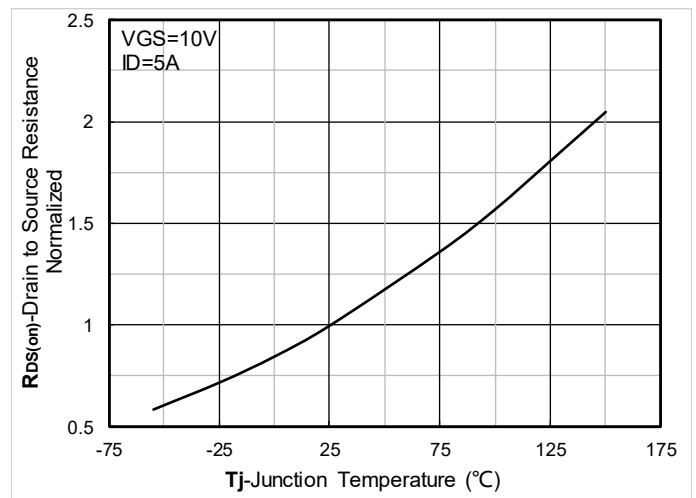


Figure 6. Normalized On-Resistance



# YJJ05N06AQ

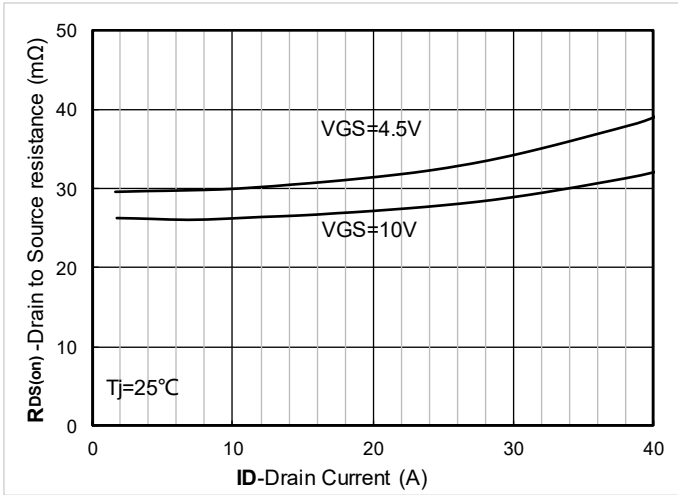


Figure 7.  $R_{DS(on)}$  VS Drain Current

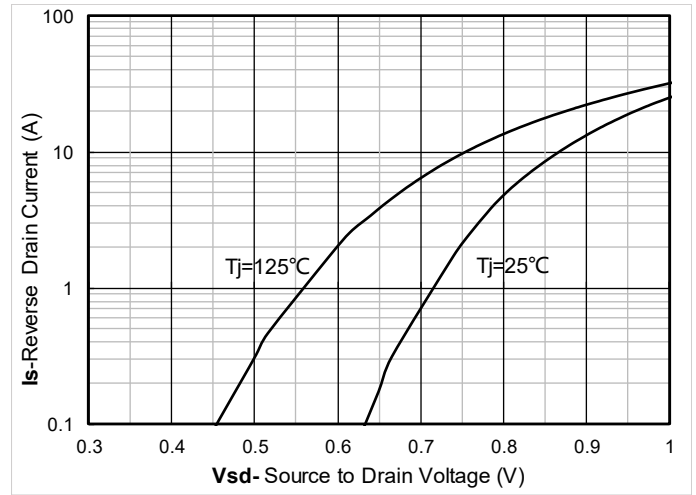


Figure 8. Forward characteristics of reverse diode

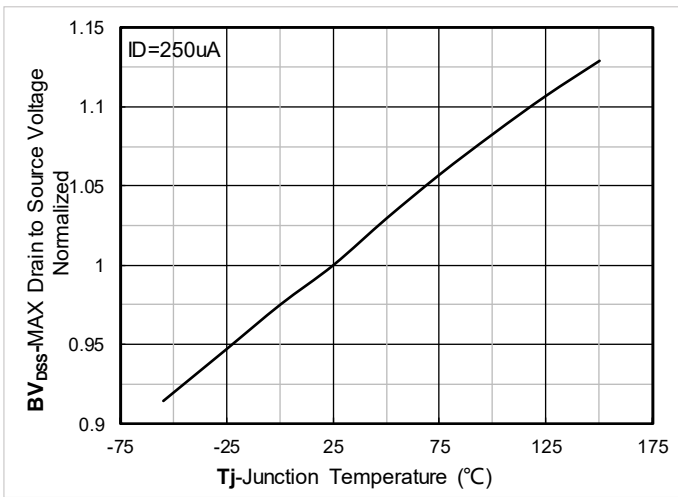


Figure 9. Normalized breakdown voltage

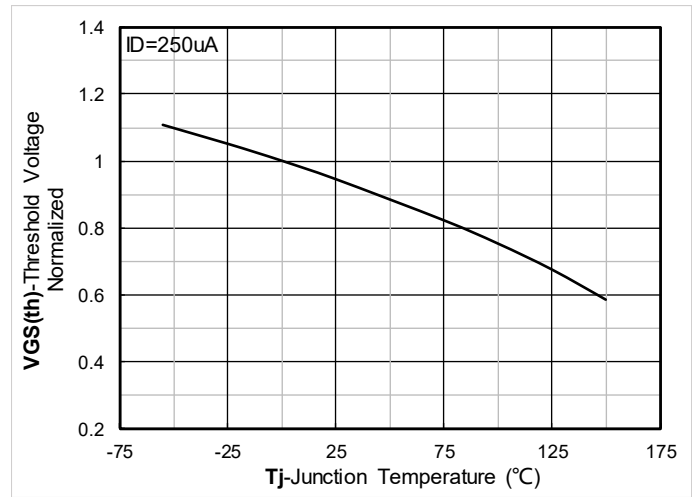


Figure 10. Normalized Threshold voltage

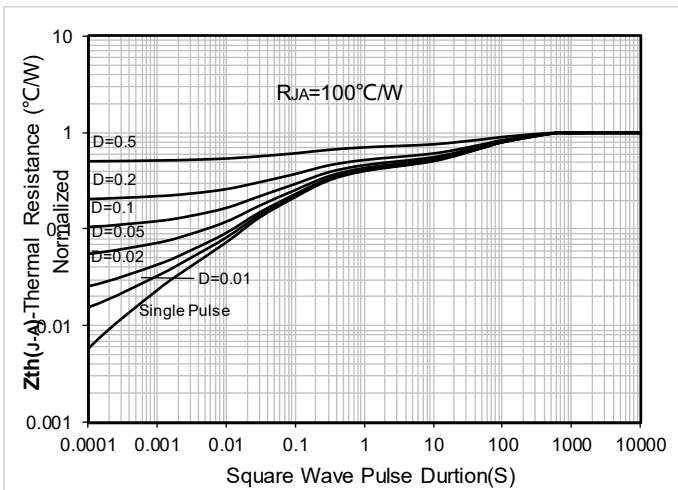


Figure 11. Maximum Transient Thermal Impedance

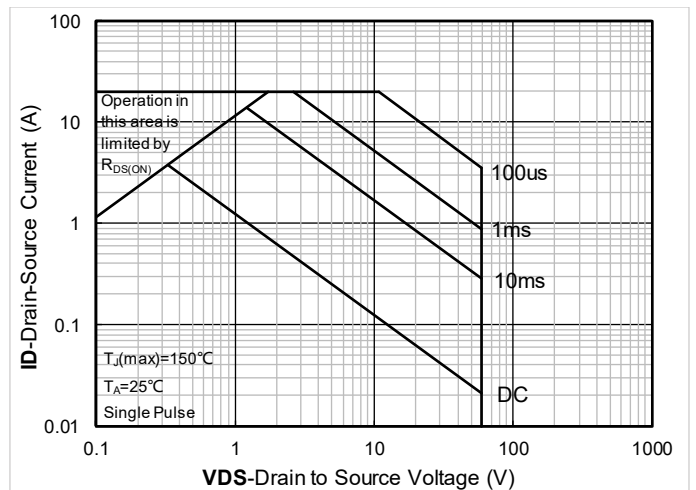
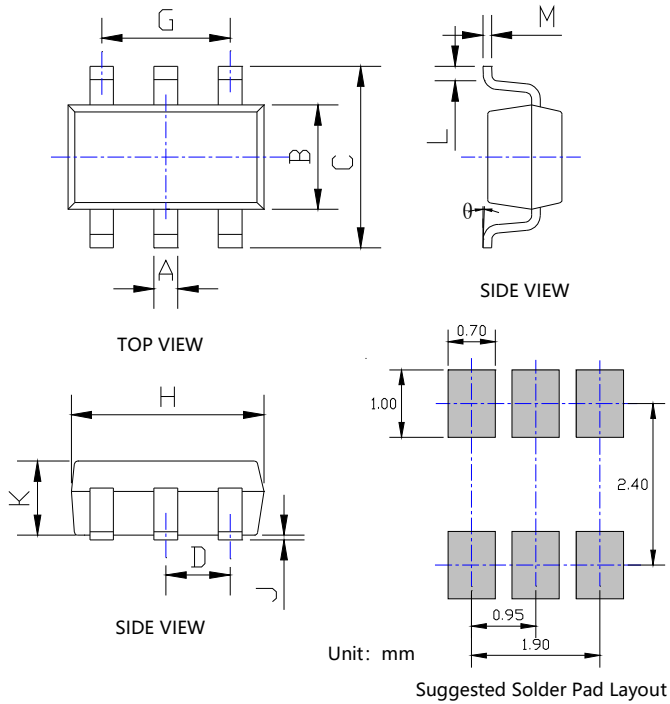


Figure 12. Safe Operation Area

## ■ SOT-23-6L Package information



SYMBOL	DIMENSIONS			
	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.012	0.020	0.300	0.500
B	0.059	0.067	1.500	1.700
C	0.104	0.116	2.650	2.950
D	0.037BSC		0.950BSC	
G	0.075BSC		1.900BSC	
H	0.111	0.119	2.820	3.020
J	0.000	0.004	0.000	0.100
K	0.041	0.045	1.050	1.150
L	0.012	0.024	0.300	0.600
M	0.004	0.008	0.100	0.200
$\theta$	0°	8°	0°	8°

**Note:**

1. Controlling dimension: in millimeters.
2. General tolerance: +/-0.05mm.
3. The pad layout is for reference purposes only.



## YJJ05N06AQ

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