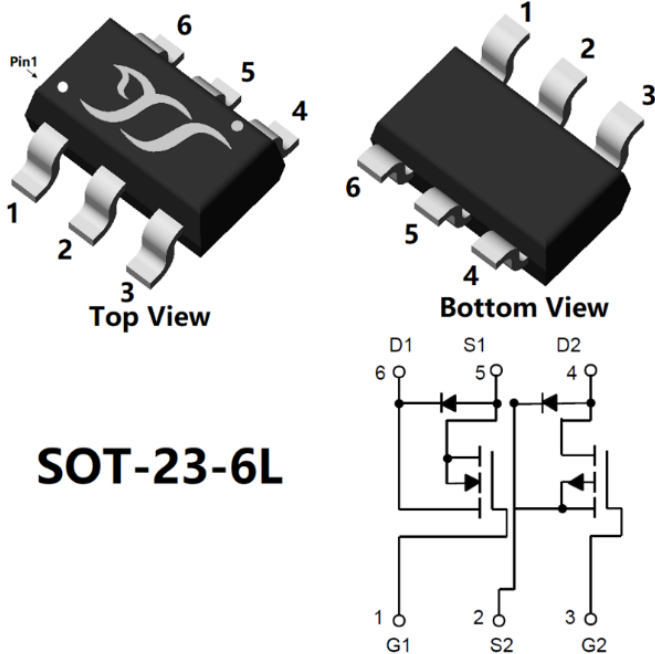


## N-Channel and P-Channel Complementary Power MOSFET



**SOT-23-6L**

### Product Summary

#### NMOS(Die1)

- $V_{DS}$  20V
- $I_D$  2.0A
- $R_{DS(ON)}$ ( at  $V_{GS}=4.5V$ ) <55 mohm
- $R_{DS(ON)}$ ( at  $V_{GS}=2.5V$ ) <75 mohm

#### PMOS(Die2)

- $V_{DS}$  -20V
- $I_D$  -1.5A
- $R_{DS(ON)}$ ( at  $V_{GS}=-4.5V$ ) <120 mohm
- $R_{DS(ON)}$ ( at  $V_{GS}=-2.5V$ ) <170 mohm

### General Description

- Trench Power LV MOSFET technology
- High Density Cell Design for Low  $R_{DS(ON)}$
- High Speed switching
- Part no. with suffix "Q" means AEC-Q101 qualified

### Applications

- Interfacing, Logic switch
- Load switch
- Power management

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

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-source Voltage		$V_{DS}$	20	-20	V
Gate-source Voltage		$V_{GS}$	$\pm 10$	$\pm 10$	V
Drain Current	$T_A=25^\circ C$	$I_D$	2.0	-1.5	A
	$T_A=100^\circ C$		1.3	-1.0	
Pulsed Drain Current <sup>A</sup>		$I_{DM}$	12	-12	A
Total Power Dissipation <sup>B</sup>	$T_A=25^\circ C$	$P_D$	595	568	mW
	$T_A=100^\circ C$		238	227	mW
Thermal Resistance Junction-to-Case @ Steady State <sup>C</sup>		$R_{\theta JA}$	210	220	$^\circ C/W$
Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~+150	-55~+150	$^\circ C$

### ■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJJ2429AQ	F2	2429	3000	30000	120000	7" reel



# YJJ2429AQ

## ■ N-MOS 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	20			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V			1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±10V, 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	0.5	0.75	1.1	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> =1A		38	55	mΩ
		V <sub>GS</sub> = 2.5V, I <sub>D</sub> =0.6A		50	75	
Diode Forward Voltage <sup>C</sup>	V <sub>SD</sub>	I <sub>S</sub> =1A, V <sub>GS</sub> =0V		0.85	1.2	V
Gate resistance	R <sub>G</sub>	f=1MHz	-	2.5		Ω
<b>Dynamic Parameters<sup>B</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHZ		186		pF
Output Capacitance	C <sub>oss</sub>			33		
Reverse Transfer Capacitance	C <sub>rss</sub>			27		
<b>Switching Parameters<sup>B</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, I <sub>D</sub> =2A		3.2		nC
Gate Source Charge	Q <sub>gs</sub>			0.8		
Gate Drain Charge	Q <sub>gd</sub>			0.8		
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>SD</sub> =2A, di/dt=80A/us		0.95		
Reverse Recovery Time	t <sub>rr</sub>			4.9		
Turn-on Delay Time	t <sub>D(on)</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, I <sub>D</sub> =2A, R <sub>g</sub> =3Ω		4.8		ns
Turn-on Rise Time	t <sub>r</sub>			28		
Turn-off Delay Time	t <sub>D(off)</sub>			15		
Turn-off Fall Time	t <sub>f</sub>			28		

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

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



# YJJ2429AQ

## ■ P-MOS 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	-20			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V, T <sub>C</sub> =25°C			-1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±10V, 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	-0.3	-0.65	-1.0	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = -4.5V, I <sub>D</sub> =-1A		86	120	mΩ
		V <sub>GS</sub> = -2.5V, I <sub>D</sub> =-0.6A		115	170	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-0.5A, V <sub>GS</sub> =0V			-1.2	V
Gate resistance	R <sub>G</sub>	f=1MHz	-	15	-	Ω
<b>Dynamic Parameters</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V, f=1MHz		70		pF
Output Capacitance	C <sub>oss</sub>			19		
Reverse Transfer Capacitance	C <sub>rss</sub>			14		
<b>Switching Parameters</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, I <sub>D</sub> =-1.2A		2.9		nC
Gate Source Charge	Q <sub>gs</sub>			0.65		
Gate Drain Charge	Q <sub>gd</sub>			0.7		
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>SD</sub> =-1.2A, di/dt=60A/us		0.9		
Reverse Recovery Time	t <sub>rr</sub>			5.4		
Turn-on Delay Time	t <sub>D(on)</sub>	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, I <sub>D</sub> =-1.2A, R <sub>g</sub> =3Ω		4.8		ns
Turn-on Rise Time	t <sub>r</sub>			22		
Turn-off Delay Time	t <sub>D(off)</sub>			21		
Turn-off Fall Time	t <sub>f</sub>			28		



## ■ N-MOS Typical Performance Characteristics

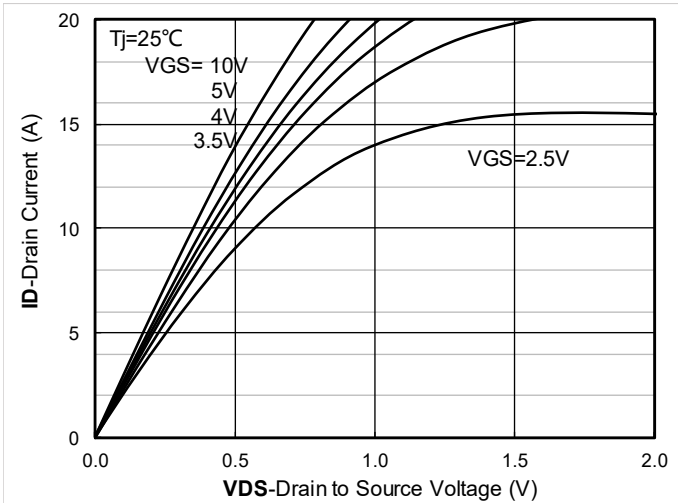


Figure1. Output Characteristics

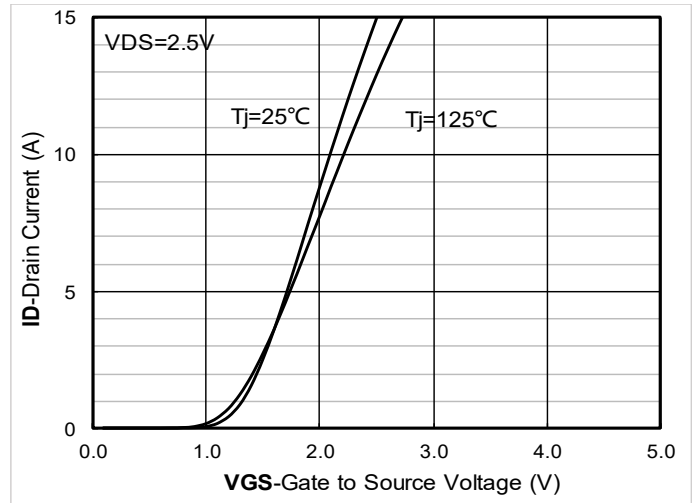


Figure2. Transfer Characteristics

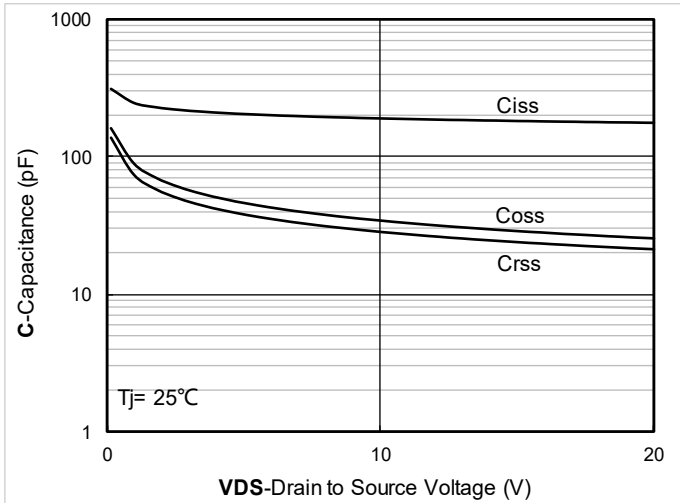


Figure3. Capacitance Characteristics

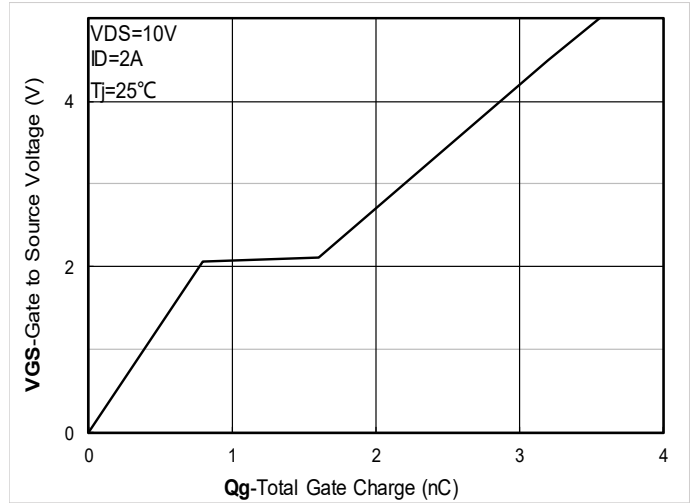


Figure4. Gate Charge

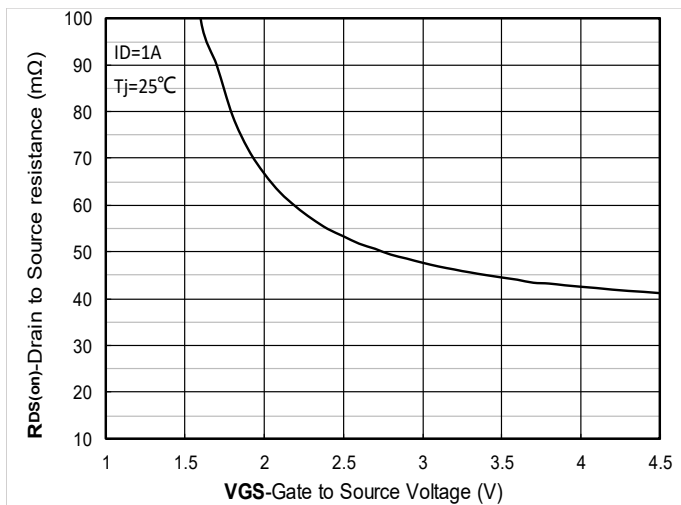


Figure5. On-Resistance vs Gate to Source Voltage

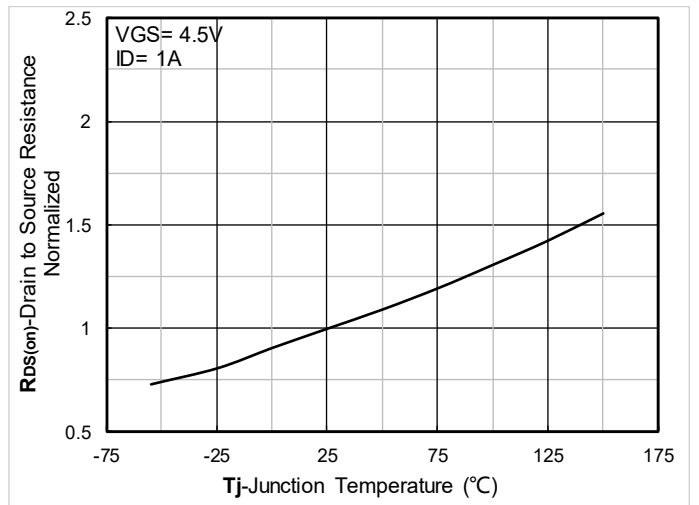


Figure6. Normalized On-Resistance

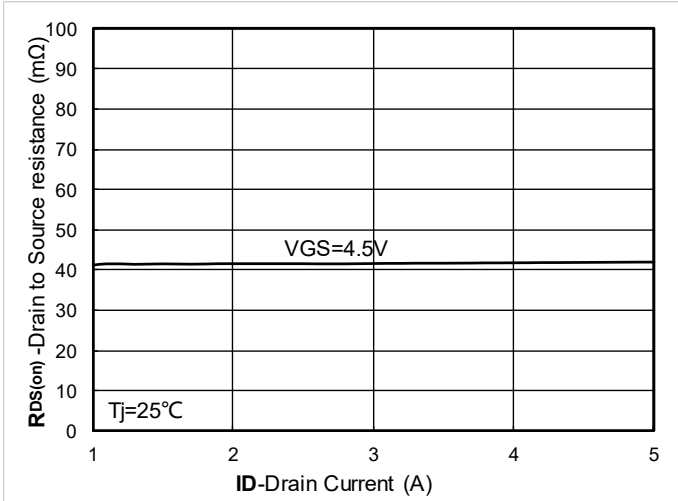


Figure 7. RDS(on) VS Drain Current

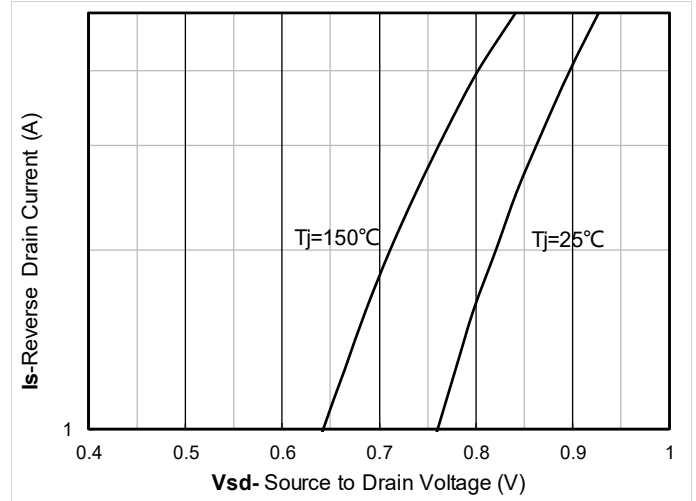


Figure 8. Forward characteristics of reverse diode

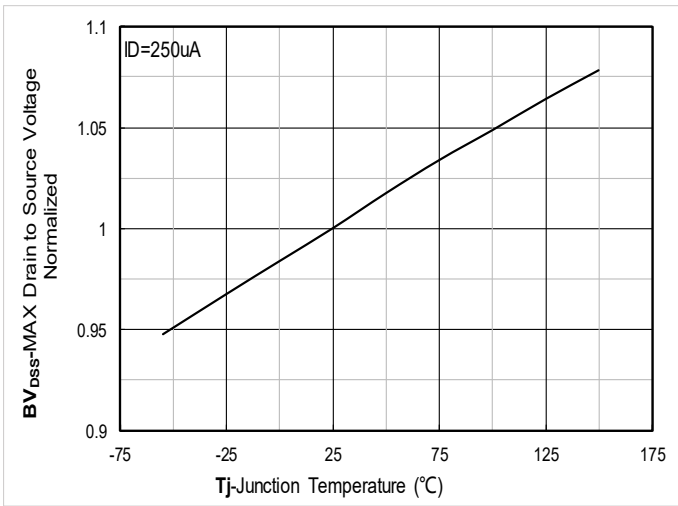


Figure 9. Normalized breakdown voltage

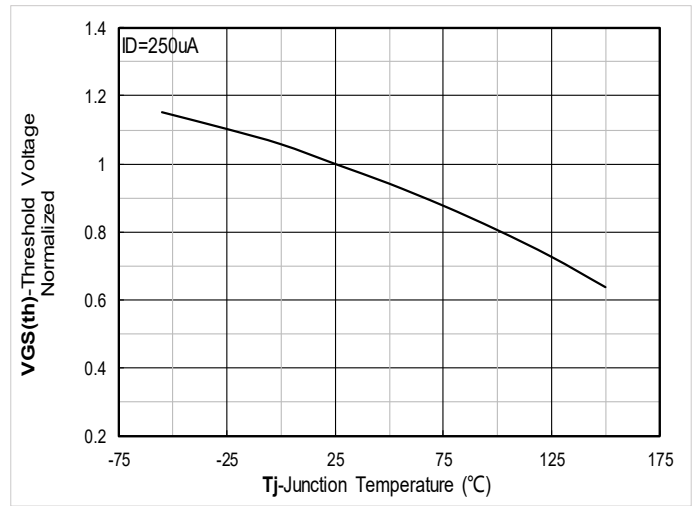


Figure 10. Normalized Threshold voltage

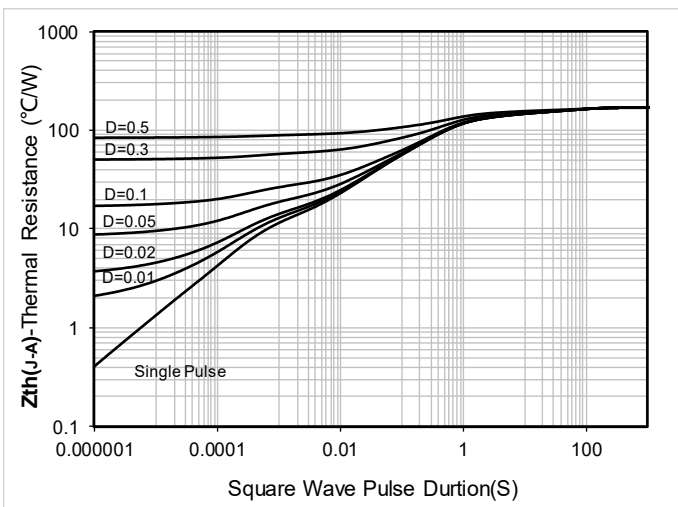


Figure 11. Maximum Transient Thermal Impedance

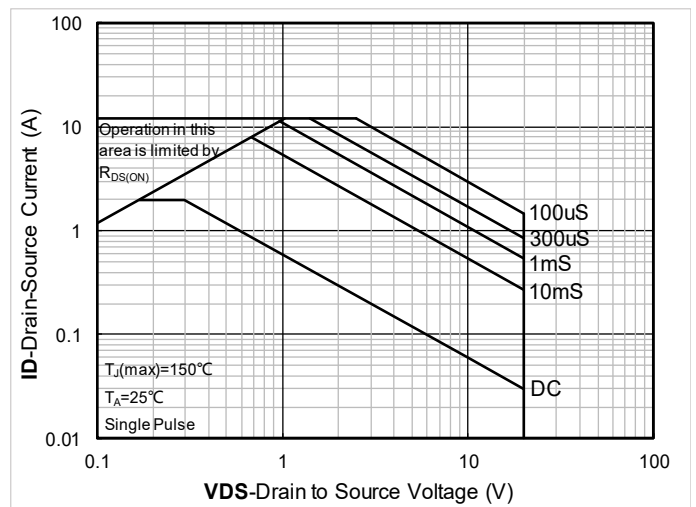


Figure 12. Safe Operation Area



## ■ P-MOS Typical Performance Characteristics

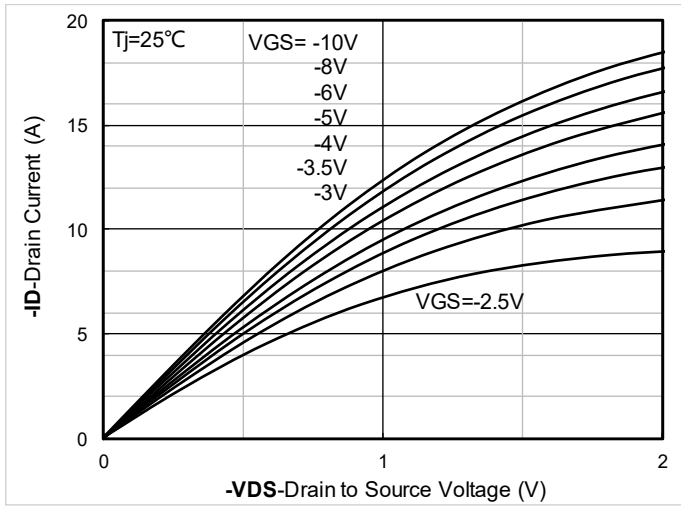


Figure1. Output Characteristics

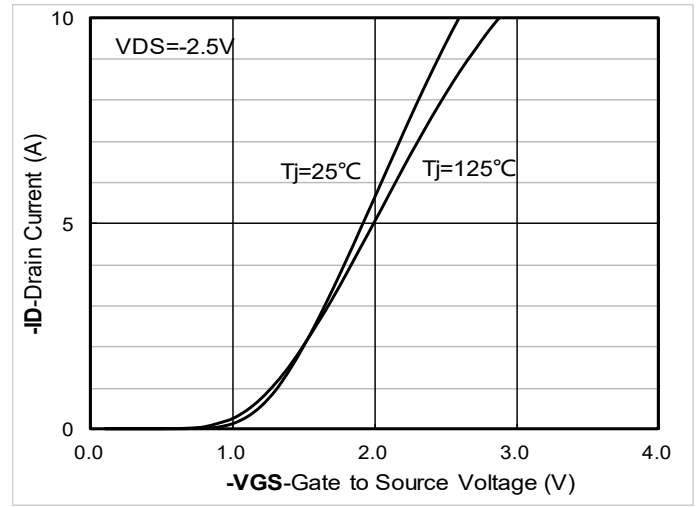


Figure2. Transfer Characteristics

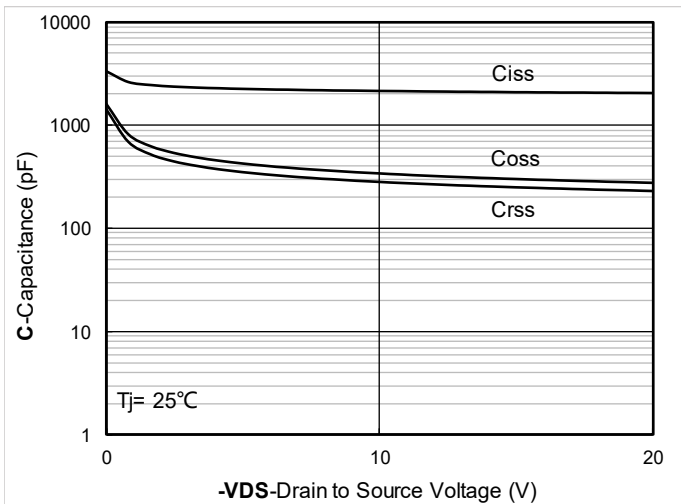


Figure3. Capacitance Characteristics

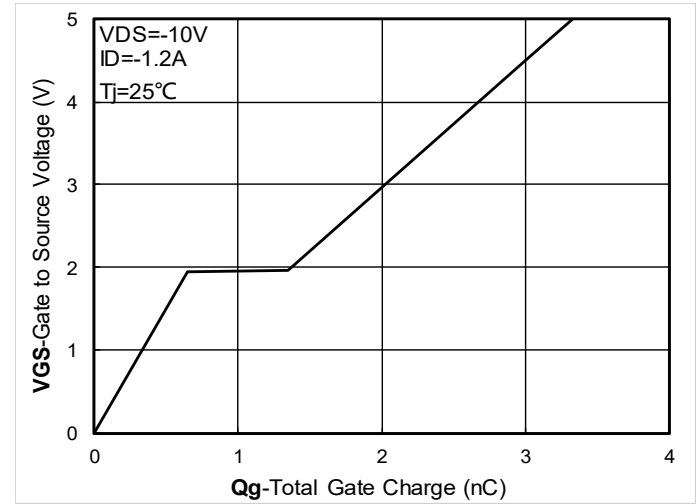


Figure4. Gate Charge

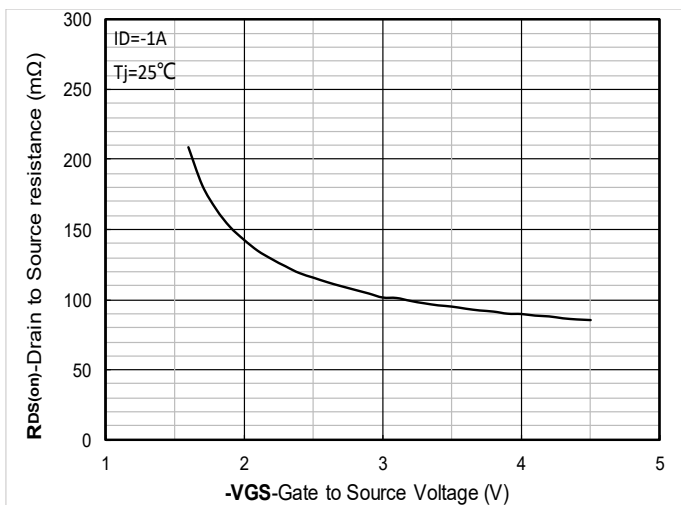


Figure5. On-Resistance vs Gate to Source Voltage

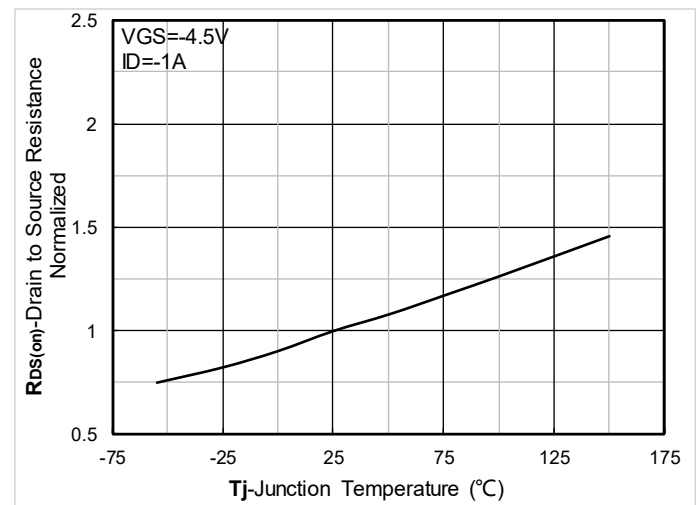


Figure6. Normalized On-Resistance



# YJJ2429AQ

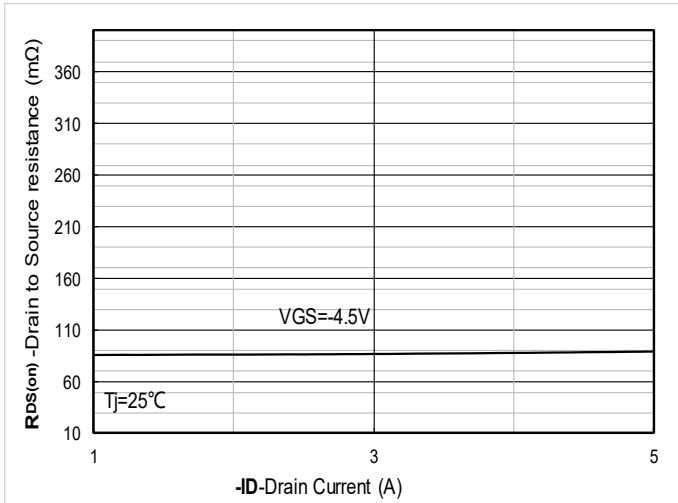


Figure 7. R<sub>DS(on)</sub> VS Drain Current

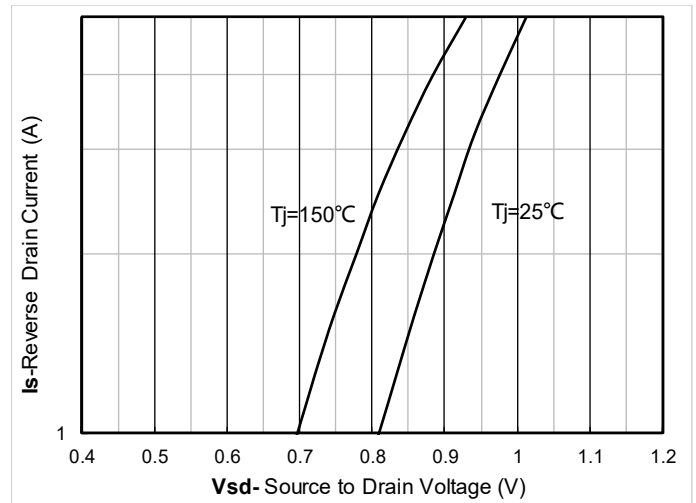


Figure 8. Forward characteristics of reverse diode

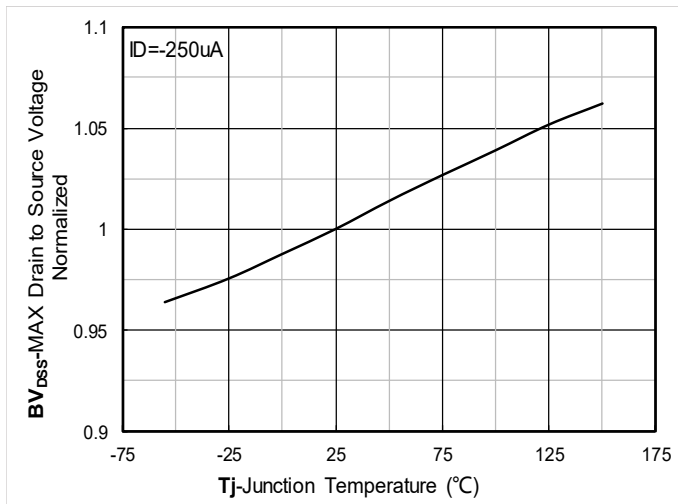


Figure 9. Normalized breakdown voltage

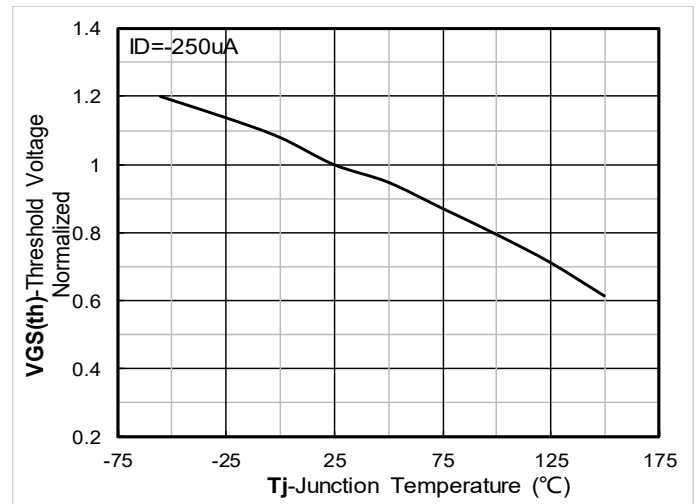


Figure 10. Normalized Threshold voltage

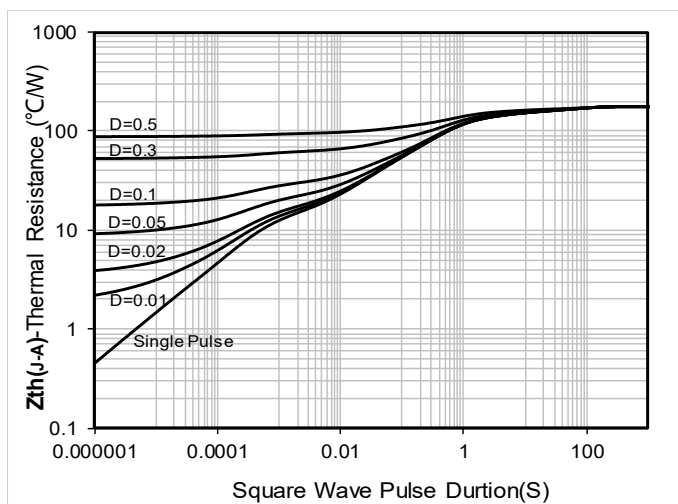


Figure 11. Maximum Transient Thermal Impedance

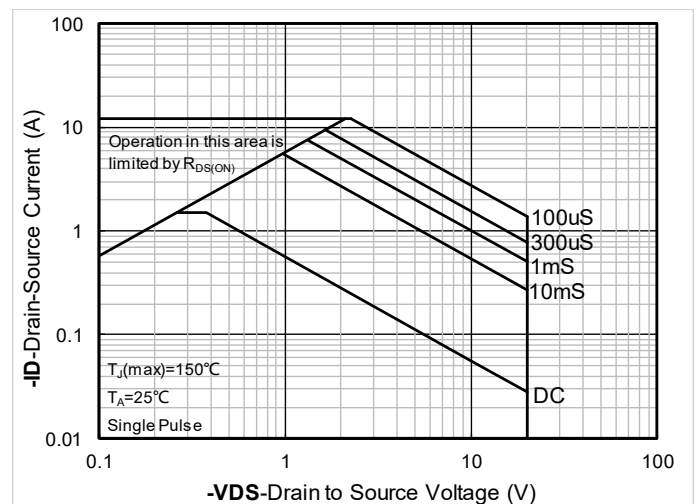
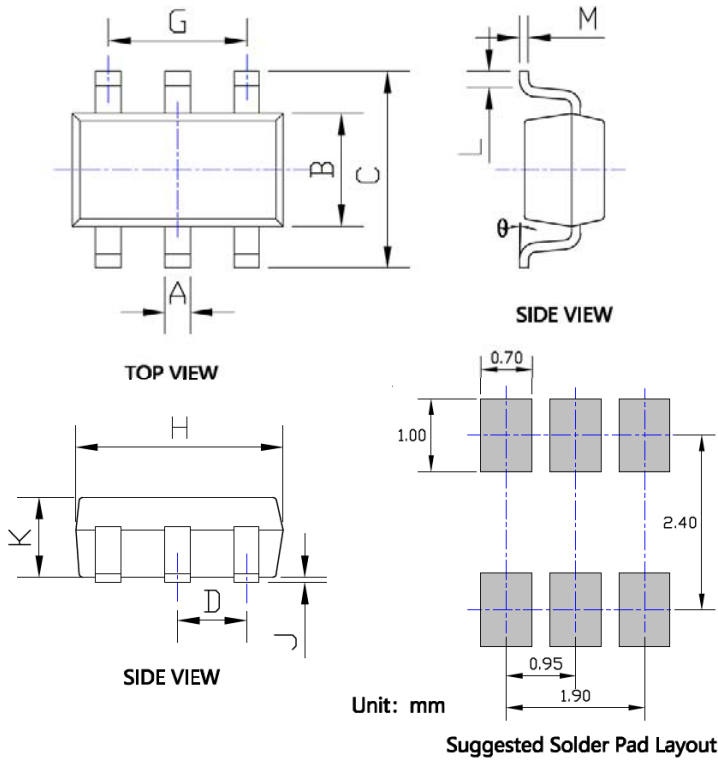


Figure 12. Safe Operation Area



# YJJ2429AQ

## ■ 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:  $\pm 0.05$ mm.
  3. The pad layout is for reference purposes only.





## YJJ2429AQ

---

### Disclaimer

The information presented in this document is for reference only. Yangzhou Yangjie Electronic Technology Co., Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise.

The product listed herein is designed to be used with automotive electronics, are not designed for use in medical, life-saving, lifesustaining, or military, Yangjie or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

This publication supersedes & replaces all information previously supplied. For additional information, please visit our website <http://www.21yangjie.com>, or consult your nearest Yangjie's sales office for further assistance.