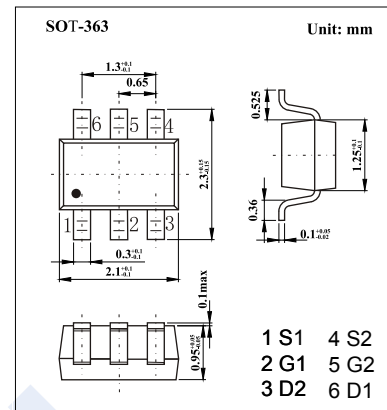
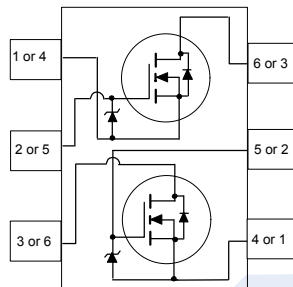


## Dual N-Channel MOSFET

### FDG6301N (KDG6301N)

#### ■ Features

- $V_{DS} (V) = 25V$
- $I_D = 220m A (V_{GS} = 4.5V)$
- $R_{DS(ON)} < 4 \Omega (V_{GS} = 4.5V)$
- $R_{DS(ON)} < 5 \Omega (V_{GS} = 2.7V)$
- Gate-Source Zener for ESD ruggedness  
( $>6kV$  Human Body Model).



#### ■ Absolute Maximum Ratings $T_a = 25^\circ C$

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	25	V
Gate-Source Voltage	$V_{GS}$	$\pm 8$	
Continuous Drain Current	$I_D$	220	mA
		Pulsed	
Electrostatic Discharge Rating MIL-STD-883D Human Body Model(100 pF / 1500 W)	ESD	6	KV
Power Dissipation	$P_D$	300	mW
Thermal Resistance.Junction- to-Ambient	$R_{thJA}$	415	$^\circ C/W$
Junction Temperature	$T_J$	150	$^\circ C$
Storage Temperature Range	$T_{stg}$	-55 to 150	

## Dual N-Channel MOSFET

### FDG6301N (KDG6301N)

#### ■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>DSS</sub>	I <sub>D</sub> =250 μA, V <sub>GS</sub> =0V	25			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V			1	μA
		V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C			10	
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±8V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 μA	0.65	0.85	1.5	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =220mA		2.6	4	Ω
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =220mA, T <sub>J</sub> =125°C		5.3	7	
		V <sub>GS</sub> =2.7V, I <sub>D</sub> =190mA		3.7	5	
On State Drain Current	I <sub>D(ON)</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =5V	0.22			A
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =220mA		0.2		S
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =10V, f=1MHz		9.5		pF
Output Capacitance	C <sub>oss</sub>			6		
Reverse Transfer Capacitance	C <sub>rss</sub>			1.3		
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =5V, I <sub>D</sub> =220mA		0.29	0.4	nC
Gate Source Charge	Q <sub>gs</sub>			0.12		
Gate Drain Charge	Q <sub>gd</sub>			0.03		
Turn-On DelayTime	t <sub>d(on)</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =5V, I <sub>D</sub> =500mA, R <sub>G</sub> =50 Ω		5	10	ns
Turn-On Rise Time	t <sub>r</sub>			4.5	10	
Turn-Off DelayTime	t <sub>d(off)</sub>			4	8	
Turn-Off Fall Time	t <sub>f</sub>			3.2	7	
Maximum Body-Diode Continuous Current	I <sub>S</sub>				0.25	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =250mA, V <sub>GS</sub> =0V (Note.1)		0.8	1.2	V

Note.1:Pulse Test: Pulse Width < 300μs, Duty Cycle < 2.0%.

#### ■ Marking

Marking	.01
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## Dual N-Channel MOSFET FDG6301N (KDG6301N)

### Typical Characteristics

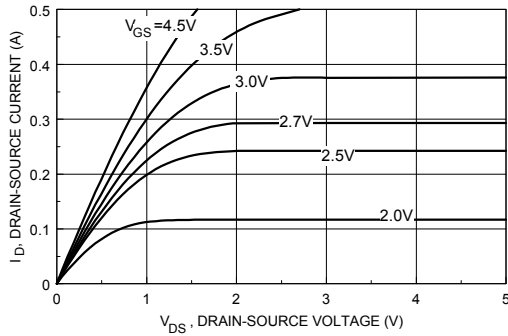


Figure 1. On-Region Characteristics.

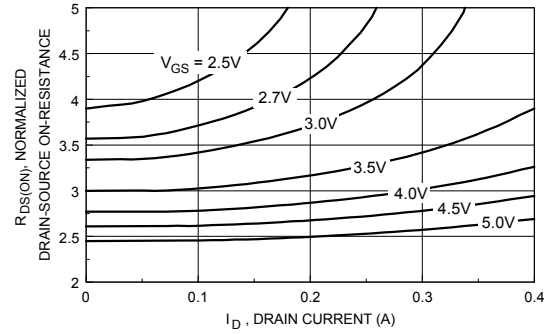


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.

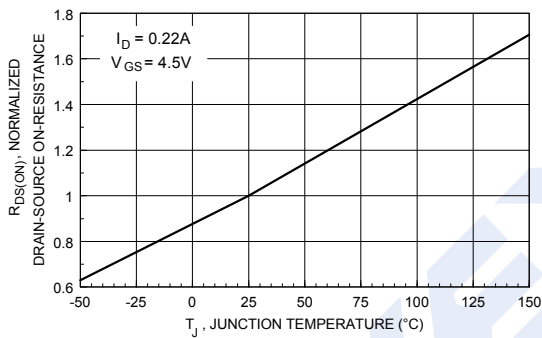


Figure 3. On-Resistance Variation with Temperature.

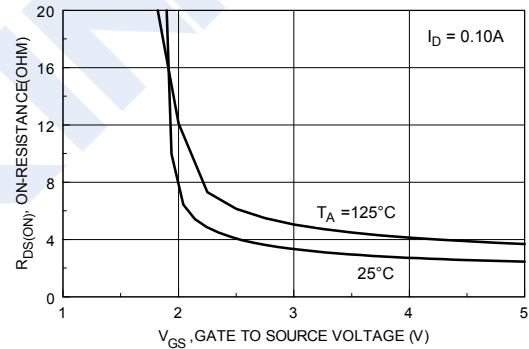


Figure 4. On-Resistance Variation with Gate-to-Source Voltage.

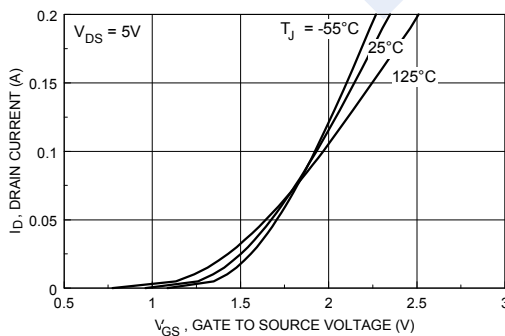


Figure 5. Transfer Characteristics.

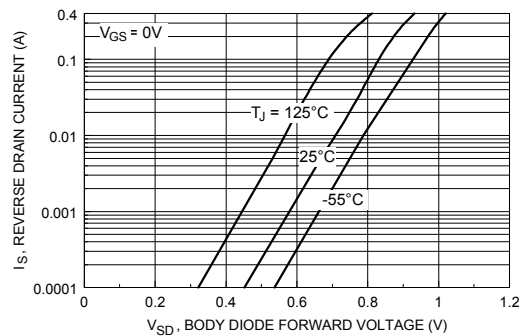


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature.

## Dual N-Channel MOSFET FDG6301N (KDG6301N)

### Typical Characteristics

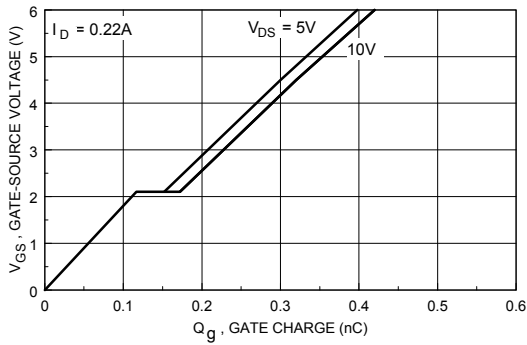


Figure 7. Gate Charge Characteristics.

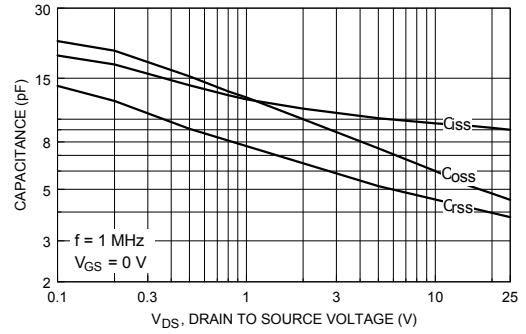


Figure 8. Capacitance Characteristics

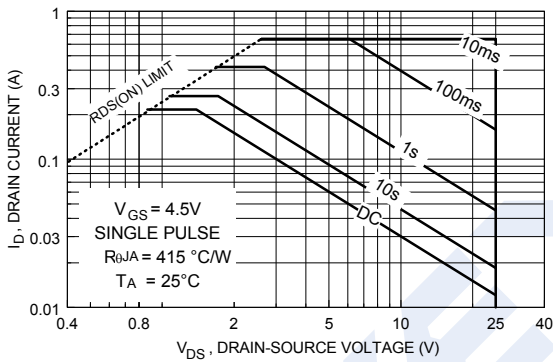


Figure 9. Maximum Safe Operating Area.

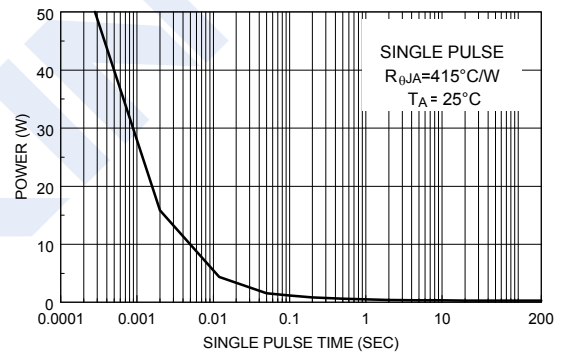


Figure 10. Single Pulse Maximum Power Dissipation.

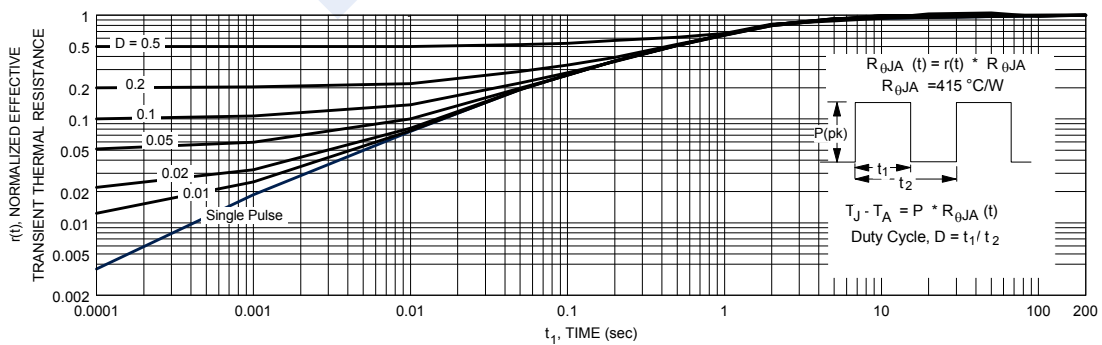


Figure 11. Transient Thermal Response Curve

Thermal characterization performed using the conditions described in note 1.  
Transient thermal response will change depending on the circuit board design.