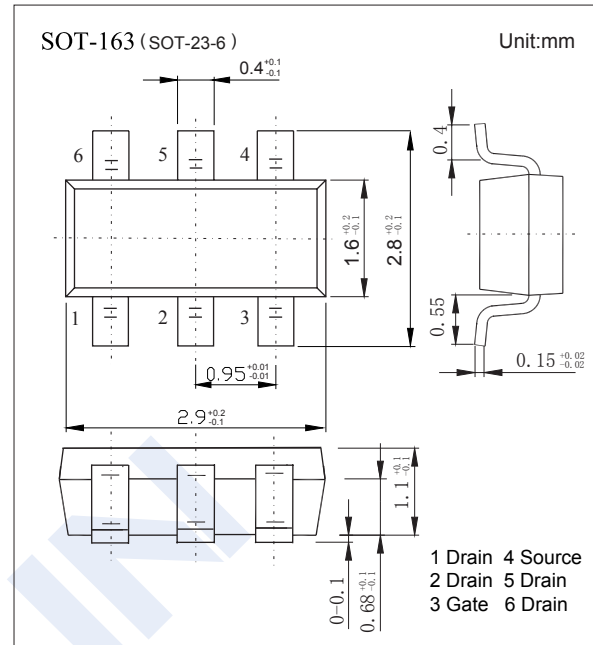
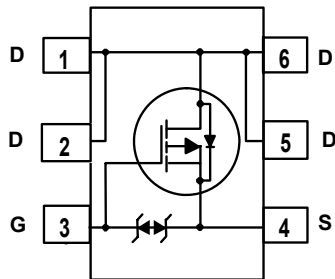


## P-Channel MOSFET

### FDC610PZ

#### ■ Features

- $V_{DS}(V) = -30V$
- $I_D = -4.9 A$  ( $V_{GS} = \pm 25V$ )
- $R_{DS(ON)} < 42m \Omega$  ( $V_{GS} = -10V$ )
- $R_{DS(ON)} < 75m \Omega$  ( $V_{GS} = -4.5V$ )



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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 25$	
Continuous Drain Current (Note1 a)	$I_D$	-4.9	A
Pulsed Drain Current		-20	
Power Dissipation (Note1 a)	$P_D$	1.6	W
Power Dissipation (Note1 b)		0.8	
Thermal Resistance.Junction- to-Ambient (Note 1a)	$R_{thJA}$	78	$^\circ C/W$
Thermal Resistance.Junction- to-Ambient (Note 1b)		156	
Junction Temperature	$T_J$	150	$^\circ C$
Junction Storage Temperature Range	$T_{stg}$	-55 to +150	

## P-Channel MOSFET

### FDC610PZ

#### ■ 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> =-250μA, V <sub>GS</sub> =0V	-30			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V			-1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±25V			±10	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-1		-3	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-4.9A			42	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3.7A			75	
		V <sub>GS</sub> =-10V, I <sub>D</sub> =-4.9A T <sub>J</sub> =125°C			60	
On State Drain Current	I <sub>D(ON)</sub>	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-5V	-20			A
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =-10V, I <sub>D</sub> =-4.9A		15		S
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V, f=1MHz			1005	pF
Output Capacitance	C <sub>oss</sub>				195	
Reverse Transfer Capacitance	C <sub>rss</sub>				190	
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz		13		Ω
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =0V to -10V			24	nC
		V <sub>GS</sub> =0V to -4.5V			13	
Gate Source Charge	Q <sub>gs</sub>	V <sub>GS</sub> =-0V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-4.9A		2.9		nC
Gate Drain Charge	Q <sub>gd</sub>			4.3		
Turn-On DelayTime	t <sub>d(on)</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-4.9A, R <sub>GEN</sub> =6Ω			14	ns
Turn-On Rise Time	t <sub>r</sub>				10	
Turn-Off DelayTime	t <sub>d(off)</sub>				53	
Turn-Off Fall Time	t <sub>f</sub>				37	
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =-4.9A, di/dt=100A/us			35	nC
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>				18	
Maximum Body-Diode Continuous Current	I <sub>S</sub>				-1.3	A
Diode Forward Voltage (Note 2)	V <sub>SD</sub>	I <sub>S</sub> =-1.3A, V <sub>GS</sub> =0V			-1.2	V

Notes:1. R<sub>θJA</sub> is determined with the device mounted on a 1in<sup>2</sup> pad 2 oz copper pad on a 1.5 x 1.5 in. board of FR-4 material. R<sub>θJC</sub> guaranteed by design while R<sub>θCA</sub> is determined by the user's board design.

- a. 78°C/W when mounted on a 1 in<sup>2</sup> pad of 2 oz copper.
  - b. 156°C/W when mounted on a minimum pad of 2 oz copper.
2. Pulse Test: Pulse Width < 300μs, Duty cycle < 2.0%.

#### ■ Marking

Marking	.610Z
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## P-Channel MOSFET FDC610PZ

■ Typical Characteristics

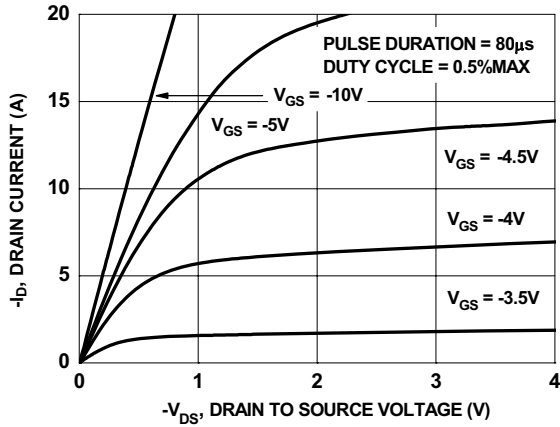


Figure 1. On-Region Characteristics

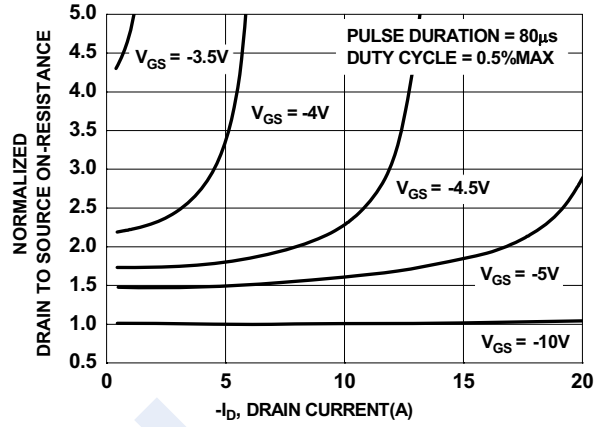


Figure 2. Normalized On-Resistance vs Drain Current and Gate Voltage

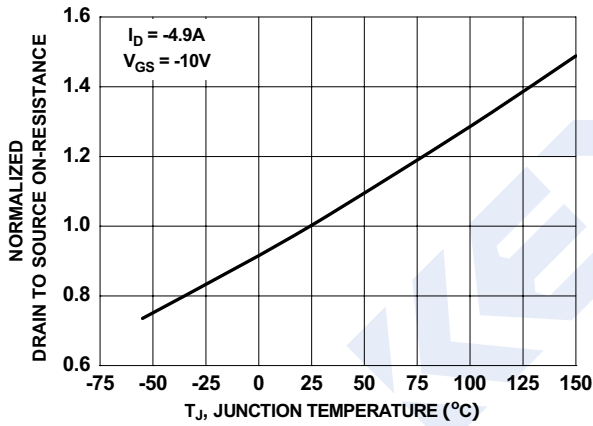


Figure 3. Normalized On-Resistance vs Junction Temperature

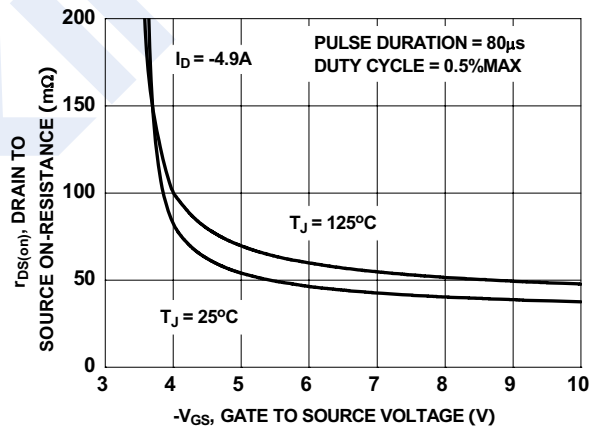


Figure 4. On-Resistance vs Gate to Source Voltage

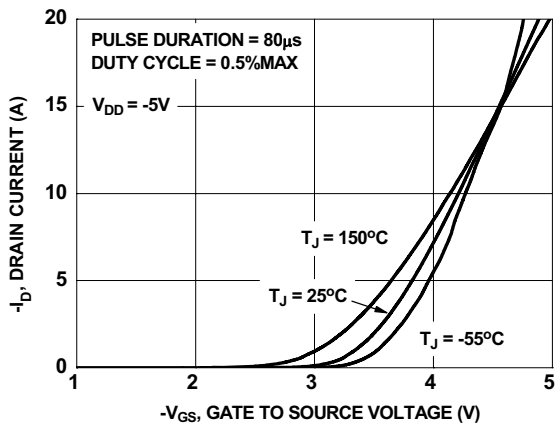


Figure 5. Transfer Characteristics

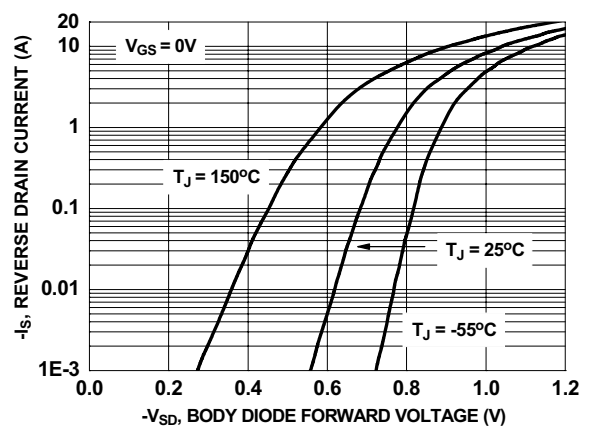


Figure 6. Source to Drain Diode Forward Voltage vs Source Current

## P-Channel MOSFET FDC610PZ

### Typical Characteristics

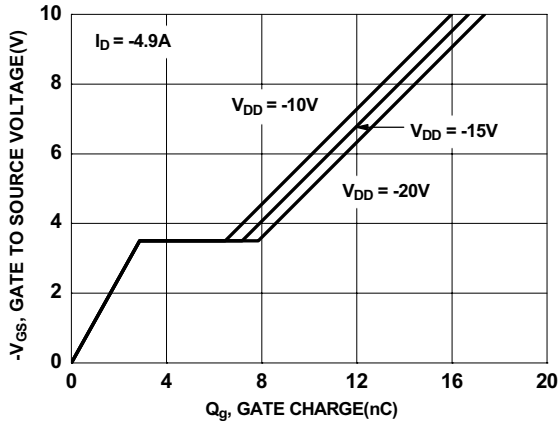


Figure 7. Gate Charge Characteristics

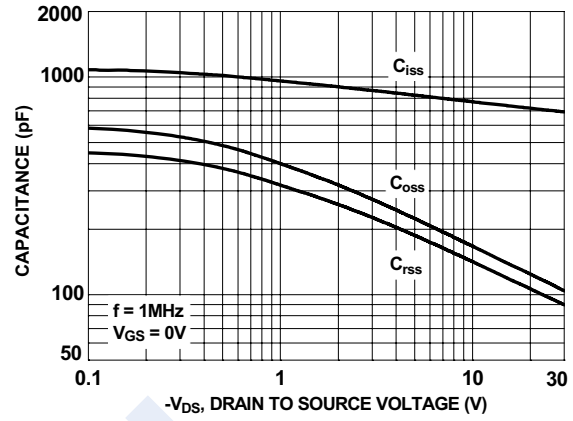


Figure 8. Capacitance vs Drain to Source Voltage

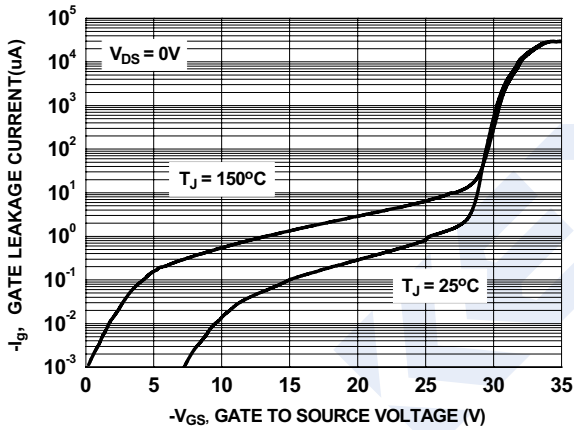


Figure 9. Gate Leakage Current vs Gate to Source Voltage

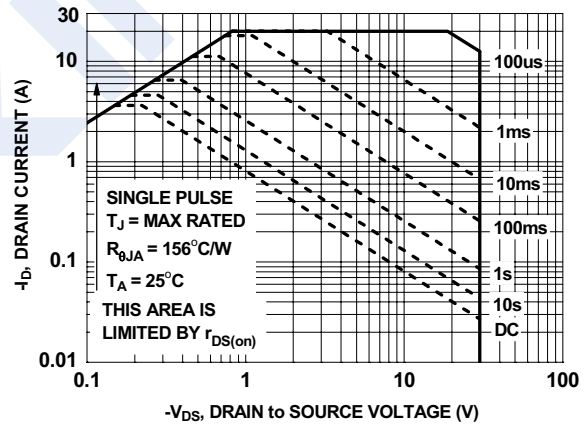


Figure 10. Forward Bias Safe Operating Area

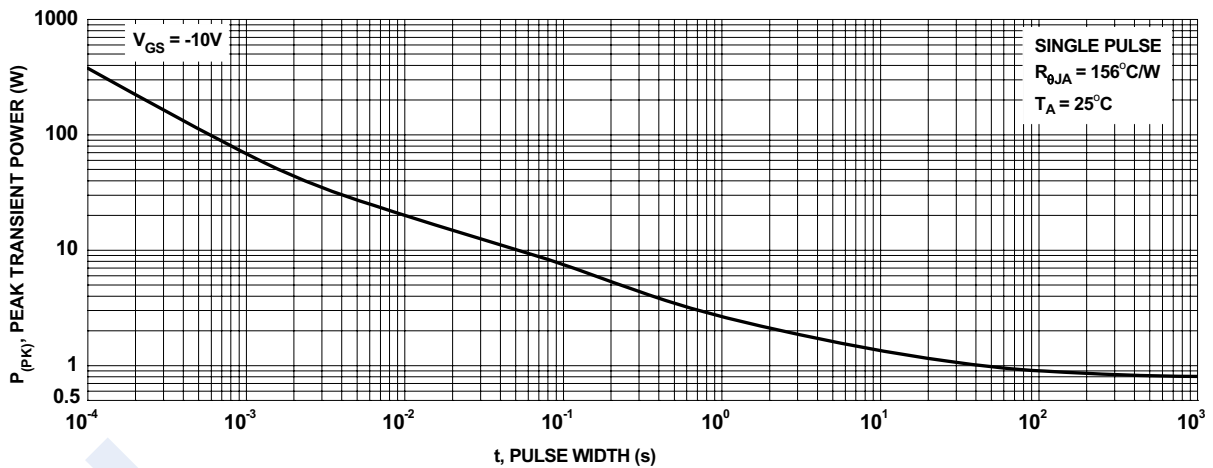


Figure 11. Single Pulse Maximum Power Dissipation

## P-Channel MOSFET FDC610PZ

### ■ Typical Characteristics

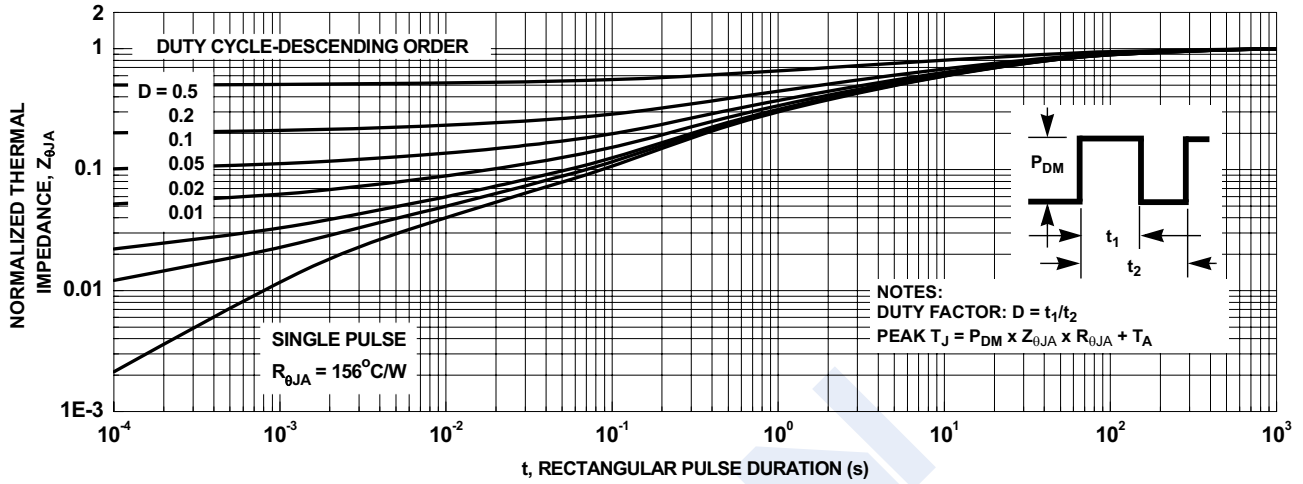


Figure 12. Transient Thermal Response Curve