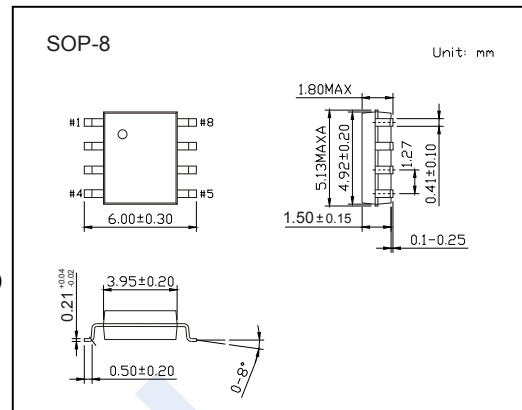
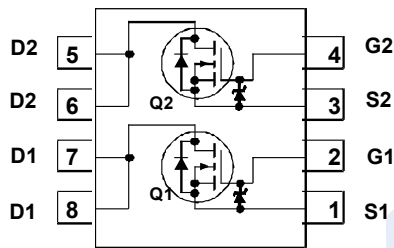


N-Channel Enhancement MOSFET

FDS89161 (KDS89161)

■ Features

- $V_{DS} (V) = 100V$
- $I_D = 2.7 A$
- $R_{DS(ON)} < 105m\Omega$ ($V_{GS} = 10V$)
- $R_{DS(ON)} < 160m\Omega$ ($V_{GS} = 4.5V$)
- High performance trench technology for extremely low $r_{DS(on)}$
- CDM ESD Protection Level > 2KV typical

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

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	V_{DS}	100	V	
Gate-Source Voltage	V_{GS}	± 20		
Continuous Drain Current	I_D	Continuous	2.7	A
		Pulsed	15	
Single Pulse Avalanche Energy	(Note1) E_{AS}	13	mJ	
Power Dissipation	P_D	$T_c=25^\circ C$	31	W
		$T_a=25^\circ C$	1.6	
Thermal Resistance.Junction- to-Ambient	R_{thJA}	78	$^\circ C/W$	
Thermal Resistance.Junction- to-Case	R_{thJC}	4		
Junction Temperature	T_J	150	$^\circ C$	
Storage Temperature Range	T_{stg}	-55 to 150		

Note 1.Starting $T_J = 25^\circ C$, $L = 0.3 mH$, $I_{AS} = 25 A$, $V_{DD} = 27 V$, $V_{GS} = 10V$.

2. $78^\circ C/W$ when mounted on a 1 in2pad of 2 oz coppe

N-Channel Enhancement MOSFET

FDS89161 (KDS89161)

■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DS}	$I_D=250\ \mu\text{A}$, $V_{GS}=0\text{V}$	100			V
Breakdown Voltage Temperature coefficient	$\Delta V_{DS}/\Delta T_J$	$I_D=250\ \mu\text{A}$, referenced to 25°C		68		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=80\text{V}$, $V_{GS}=0\text{V}$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{DS}=0\text{V}$, $V_{GS}=\pm 20\text{V}$			± 10	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\ \mu\text{A}$	1	1.7	2.2	V
Gate to Source Threshold Voltage Temperature Coefficient	$\Delta V_{GS(th)}/\Delta T_J$	$I_D=250\ \mu\text{A}$, referenced to 25°C		-6		mV/°C
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10\text{V}$, $I_D=2.7\text{A}$		81	105	m Ω
		$V_{GS}=4.5\text{V}$, $I_D=2.1\text{A}$		110	160	
		$V_{GS}=10\text{V}$, $I_D=2.7\text{A}$ $T_J=125^\circ\text{C}$		140	182	
Forward Transconductance	g_{FS}	$V_{DS}=10\text{V}$, $I_D=2.7\text{A}$		7.8		S
Input Capacitance	C_{iss}	$V_{GS}=0\text{V}$, $V_{DS}=50\text{V}$, $f=1\text{MHz}$		227	302	pF
Output Capacitance	C_{oss}			44	58	
Reverse Transfer Capacitance	C_{rss}			3	4	
Gate Resistance	R_g			0.9		
Total Gate Charge	Q_g	$V_{GS}=0$ to 10V	$V_{DS}=50\text{V}$, $I_D=2.7\text{A}$	3.8	5.3	nC
		$V_{GS}=0$ to 5V		2.1	2.9	
Gate Source Charge	Q_{gs}			0.7		
Gate Drain Charge	Q_{gd}			0.7		
Turn-On DelayTime	$t_{d(on)}$	$V_{GS}=10\text{V}$, $V_{DS}=50\text{V}$, $I_D=2.7\text{A}$, $R_{GEN}=6\ \Omega$		3.8	10	ns
Turn-On Rise Time	t_r			1.2	10	
Turn-Off DelayTime	$t_{d(off)}$			9.5	17	
Turn-Off Fall Time	t_f			1.6	10	
Body Diode Reverse Recovery Time	t_{rr}	$I_F=2.7\text{A}$, $di/dt=100\text{A}/\mu\text{s}$		31	56	nC
Body Diode Reverse Recovery Charge	Q_{rr}			20	36	
Diode Forward Voltage (Note 1)	V_{SD}	$I_S=2.7\text{A}$, $V_{GS}=0\text{V}$		0.8	1.3	V
		$I_S=2\text{A}$, $V_{GS}=0\text{V}$		0.8	1.2	

Note 1. Pulse Width < 300 μs , Duty cycle < 2.0%.

N-Channel Enhancement MOSFET

FDS89161 (KDS89161)

■ Typical Characteristics

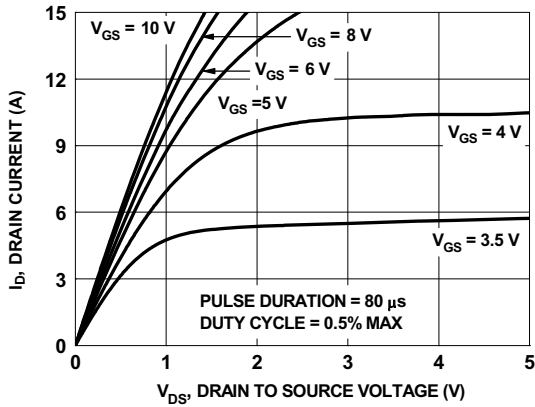


Figure 1. On-Region Characteristics

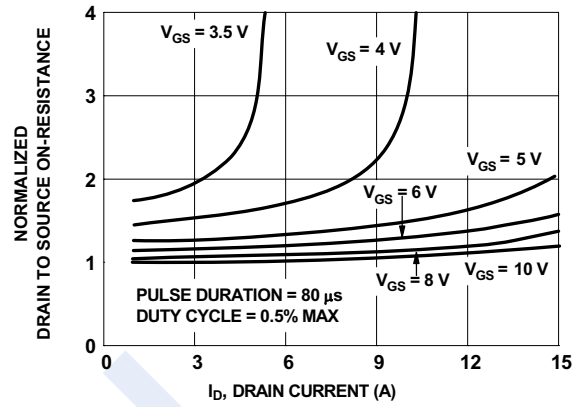


Figure 2. Normalized On-Resistance vs Drain Current and Gate Voltage

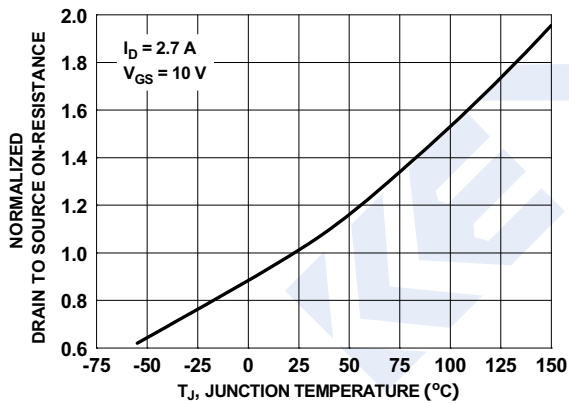


Figure 3. Normalized On-Resistance vs Junction Temperature

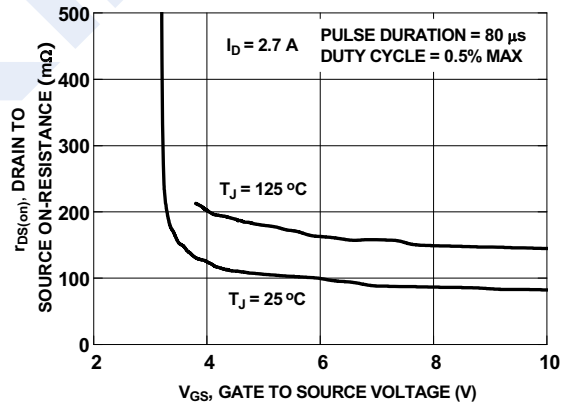


Figure 4. On-Resistance vs Gate to Source Voltage

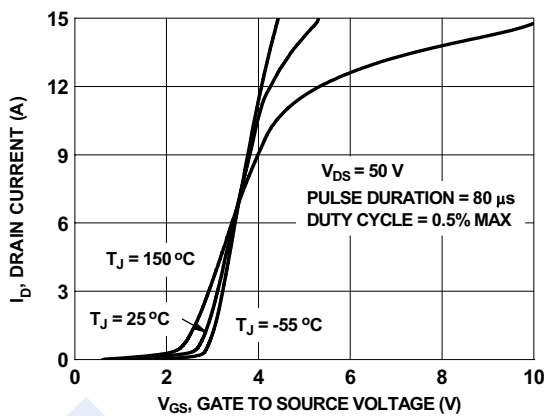


Figure 5. Transfer Characteristics

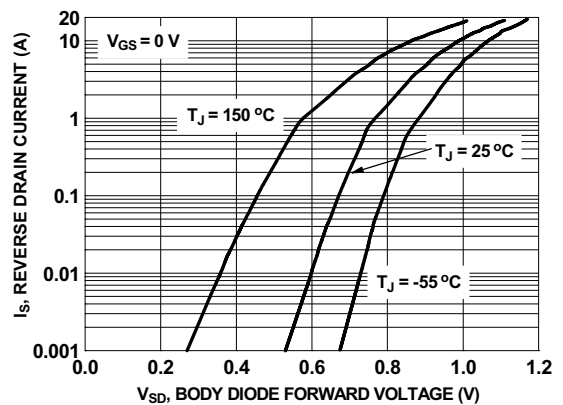


Figure 6. Source to Drain Diode Forward Voltage vs Source Current

N-Channel Enhancement MOSFET FDS89161 (KDS89161)

■ Typical Characteristics

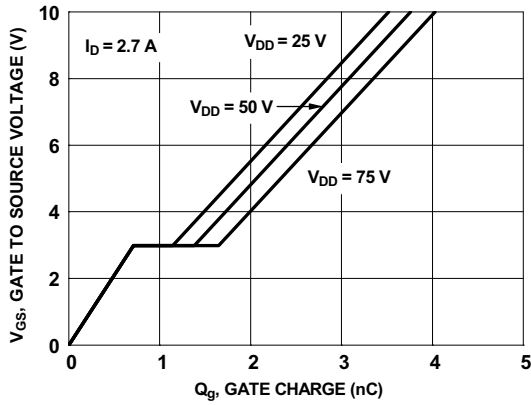


Figure 7. Gate Charge Characteristics

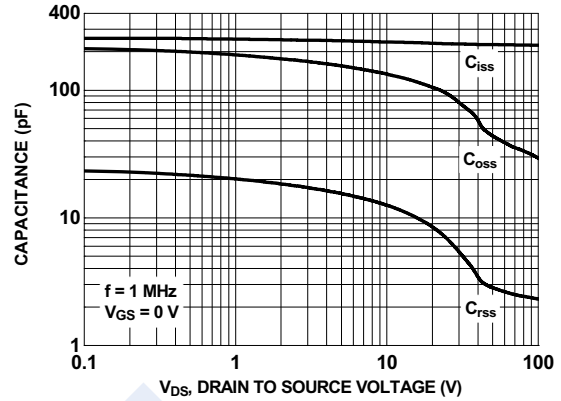


Figure 8. Capacitance vs Drain to Source Voltage

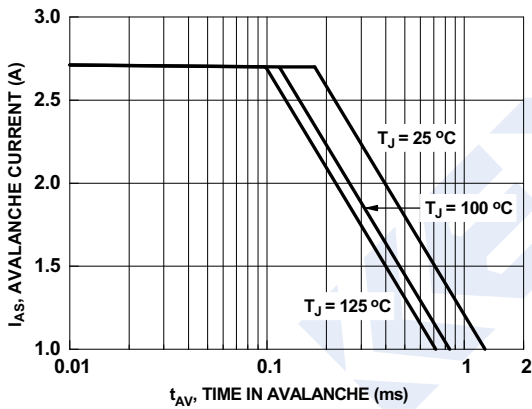


Figure 9. Unclamped Inductive Switching Capability

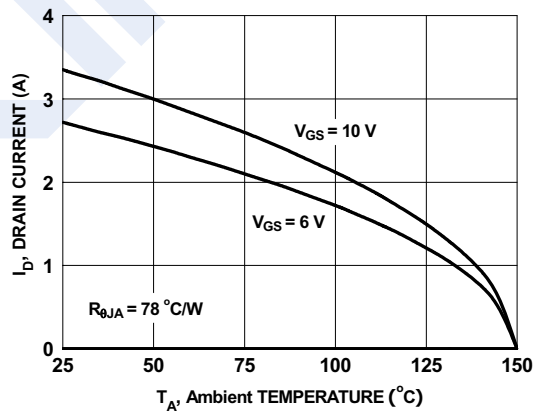


Figure 10. Maximum Continuous Drain Current vs Ambient Temperature

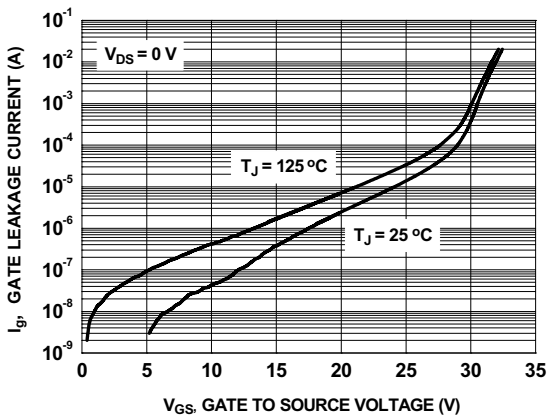


Figure 11. Gate Leakage Current vs Gate to Source Voltage

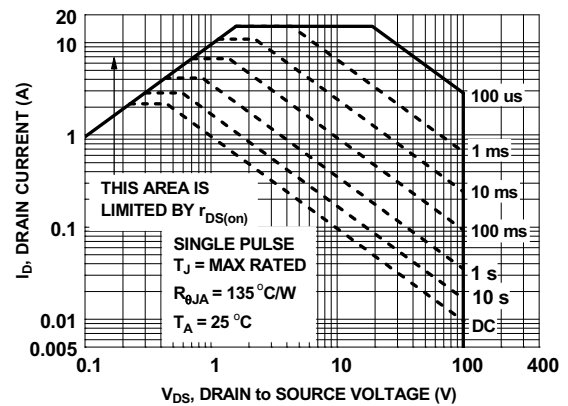


Figure 12. Forward Bias Safe Operating Area

N-Channel Enhancement MOSFET

FDS89161 (KDS89161)

■ Typical Characteristics

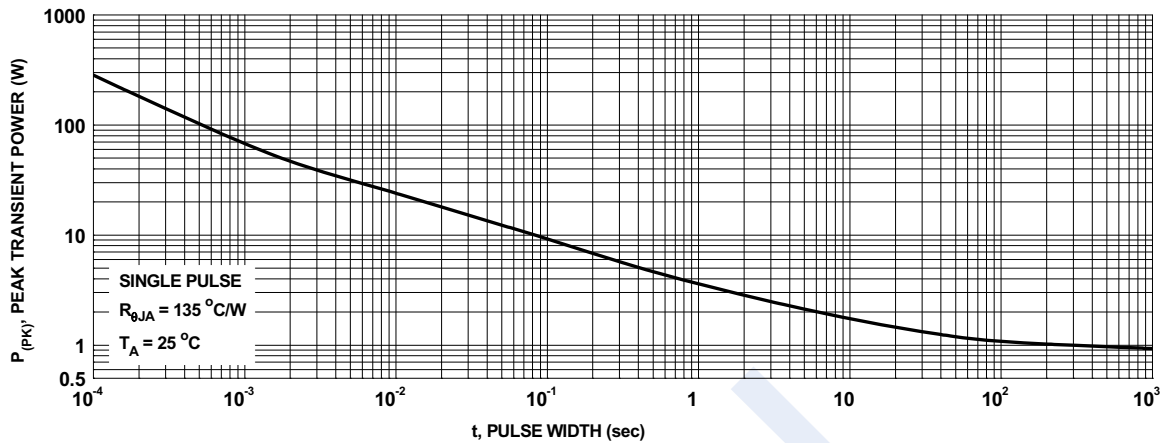


Figure 13. Single Pulse Maximum Power Dissipation

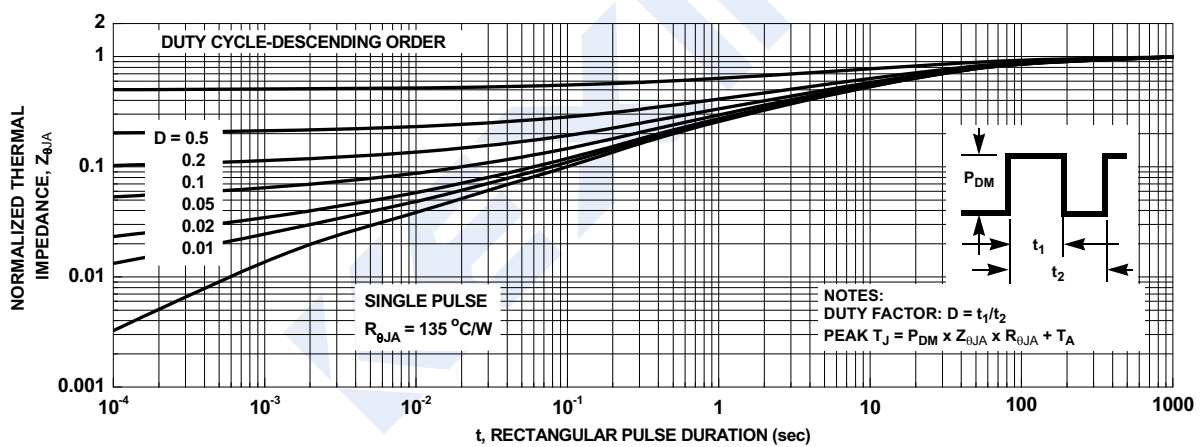


Figure 14. Junction-to-Ambient Transient Thermal Response Curve