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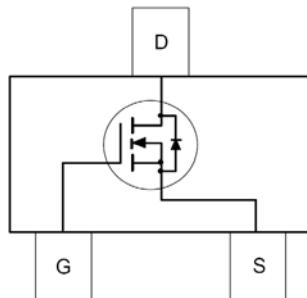
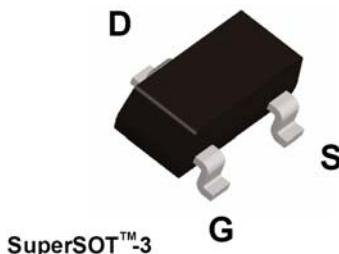
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FDN8601

N-Channel PowerTrench® MOSFET 100 V, 2.7 A, 109 mΩ

Features

- Max $r_{DS(on)}$ = 109 mΩ at $V_{GS} = 10$ V, $I_D = 1.5$ A
- Max $r_{DS(on)}$ = 175 mΩ at $V_{GS} = 6$ V, $I_D = 1.2$ A
- High performance trench technology for extremely low $r_{DS(on)}$
- High power and current handling capability in a widely used surface mount package
- Fast switching speed
- 100% UIL tested
- RoHS Compliant



MOSFET Maximum Ratings $T_A = 25$ °C unless otherwise noted

Symbol	Parameter	Ratings	Units
V_{DS}	Drain to Source Voltage	100	V
V_{GS}	Gate to Source Voltage	± 20	V
I_D	-Continuous	(Note 1a)	A
	-Pulsed	2.7	
E_{AS}	Single Pulse Avalanche Energy	13	mJ
P_D	Power Dissipation	(Note 1a)	W
	Power Dissipation	(Note 1b)	
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	°C

Thermal Characteristics

$R_{θJC}$	Thermal Resistance, Junction to Case	(Note 1)	75	°C/W
$R_{θJA}$	Thermal Resistance, Junction to Ambient	(Note 1a)	80	

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
8601	FDN8601	SSOT-3	7 "	8 mm	3000 units

Electrical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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Off Characteristics

BV_{DSS}	Drain to Source Breakdown Voltage	$I_D = 250 \mu\text{A}, V_{GS} = 0 \text{ V}$	100			V
$\frac{\Delta \text{BV}_{\text{DSS}}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	$I_D = 250 \mu\text{A}$, referenced to 25°C		68		$\text{mV}/^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 80 \text{ V}, V_{GS} = 0 \text{ V}$			1	μA
I_{GSS}	Gate to Source Leakage Current	$V_{GS} = \pm 20 \text{ V}, V_{DS} = 0 \text{ V}$			± 100	nA

On Characteristics (Note 2)

$V_{GS(\text{th})}$	Gate to Source Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250 \mu\text{A}$	2.0	3.0	4.0	V
$\frac{\Delta V_{GS(\text{th})}}{\Delta T_J}$	Gate to Source Threshold Voltage Temperature Coefficient	$I_D = 250 \mu\text{A}$, referenced to 25°C		-8		$\text{mV}/^\circ\text{C}$
$r_{DS(\text{on})}$	Static Drain to Source On Resistance	$V_{GS} = 10 \text{ V}, I_D = 1.5 \text{ A}$		85.4	109	$\text{m}\Omega$
		$V_{GS} = 6 \text{ V}, I_D = 1.2 \text{ A}$		117	175	
		$V_{GS} = 10 \text{ V}, I_D = 1.5 \text{ A}, T_J = 125^\circ\text{C}$		143	183	
g_{FS}	Forward Transconductance	$V_{DS} = 10 \text{ V}, I_D = 1.5 \text{ A}$		8		S

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 50 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		156	210	pF
C_{oss}	Output Capacitance			47	65	pF
C_{rss}	Reverse Transfer Capacitance			2.7	5	pF
R_g	Gate Resistance			1.0		Ω

Switching Characteristics

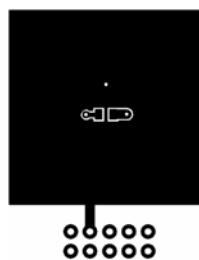
$t_{d(\text{on})}$	Turn-On Delay Time	$V_{DD} = 50 \text{ V}, I_D = 1.5 \text{ A}, V_{GS} = 10 \text{ V}, R_{\text{GEN}} = 6 \Omega$		4.3	10	ns
t_r	Rise Time			1.3	10	ns
$t_{d(\text{off})}$	Turn-Off Delay Time			7.8	16	ns
t_f	Fall Time			3.4	10	ns
Q_g	Total Gate Charge	$V_{GS} = 0 \text{ V} \text{ to } 10 \text{ V}$		3	5	nC
	Total Gate Charge		$V_{GS} = 0 \text{ V} \text{ to } 5 \text{ V}$	$V_{DD} = 50 \text{ V}, I_D = 1.5 \text{ A}$	1.8	3
Q_{gs}	Gate to Source Gate Charge			0.9		nC
Q_{gd}	Gate to Drain "Miller" Charge			0.8		nC

Drain-Source Diode Characteristics

V_{SD}	Source to Drain Diode Forward Voltage	$V_{GS} = 0 \text{ V}, I_S = 1.5 \text{ A}$ (Note 2)		0.81	1.3	V
t_{rr}	Reverse Recovery Time	$I_F = 1.5 \text{ A}, dI/dt = 100 \text{ A}/\mu\text{s}$		29	46	ns
Q_{rr}	Reverse Recovery Charge				15	27

Notes:

- R_{QJA} is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. R_{QJC} is guaranteed by design while R_{QCA} is determined by the user's board design.



a) $80^\circ\text{C}/\text{W}$ when mounted on a 1 in² pad of 2 oz copper



b) $180^\circ\text{C}/\text{W}$ when mounted on a minimum pad.

2. Pulse Test: Pulse Width < 300 μs , Duty cycle < 2.0%.

3. Starting $T_J = 25^\circ\text{C}$; N-ch: L = 3 mH, $I_{AS} = 3 \text{ A}$, $V_{DD} = 100 \text{ V}$, $V_{GS} = 10 \text{ V}$.

Typical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise noted

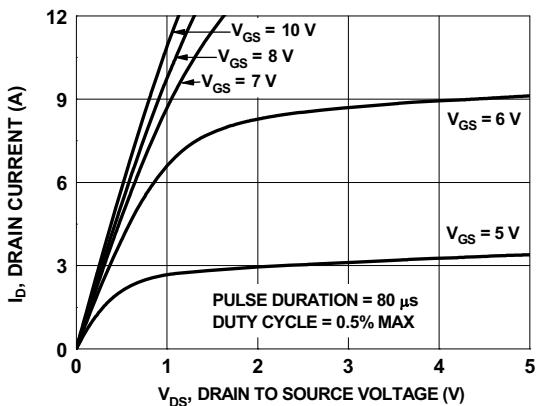


Figure 1. On-Region Characteristics

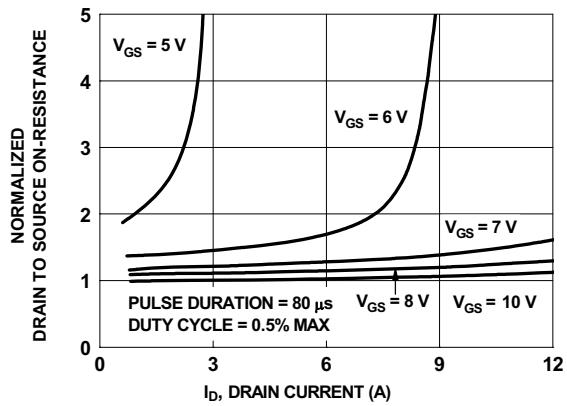


Figure 2. Normalized On-Resistance vs Drain Current and Gate Voltage

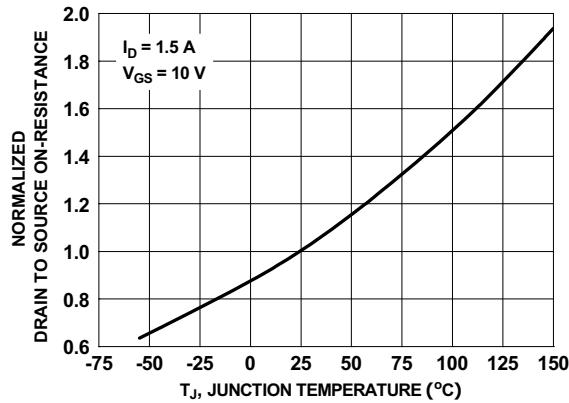


Figure 3. Normalized On-Resistance vs Junction Temperature

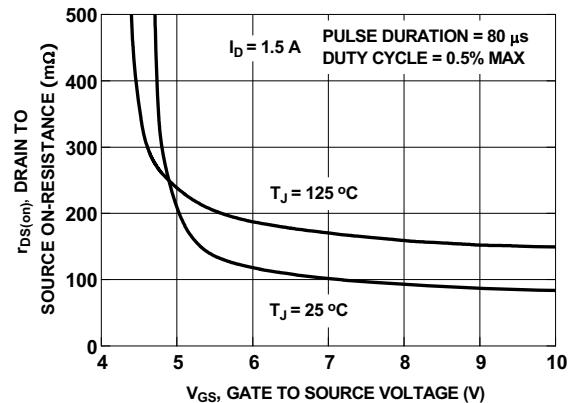


Figure 4. On-Resistance vs Gate to Source Voltage

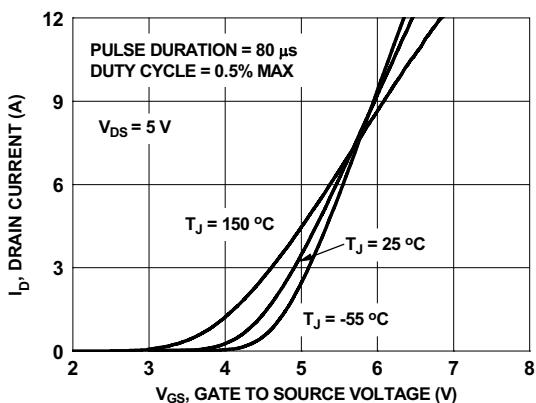


Figure 5. Transfer Characteristics

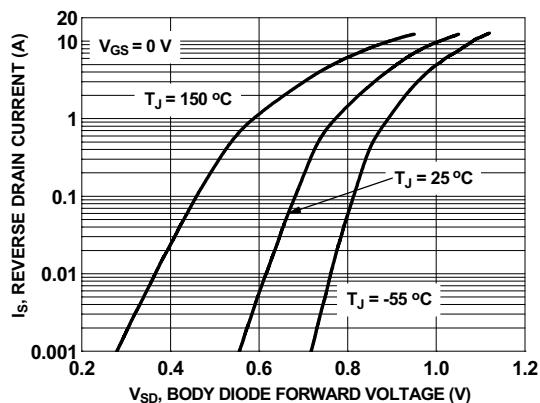
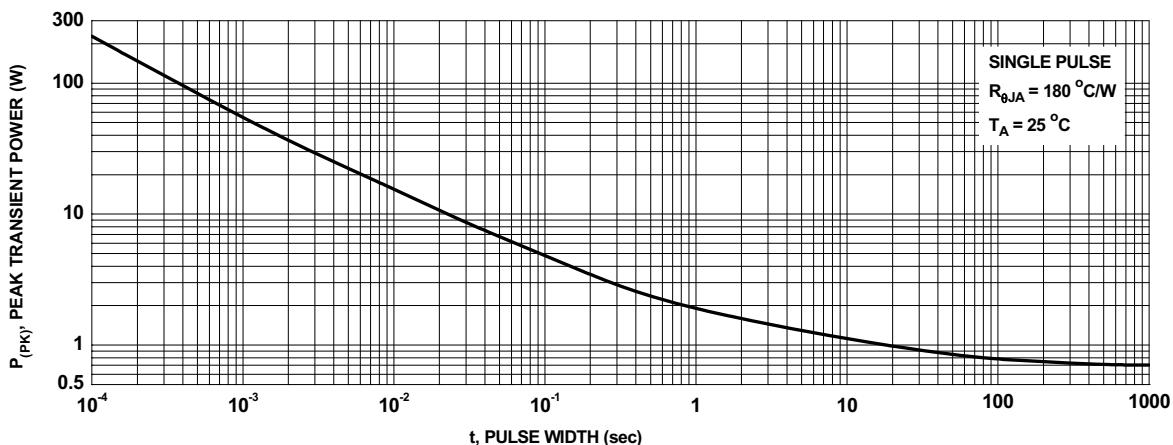
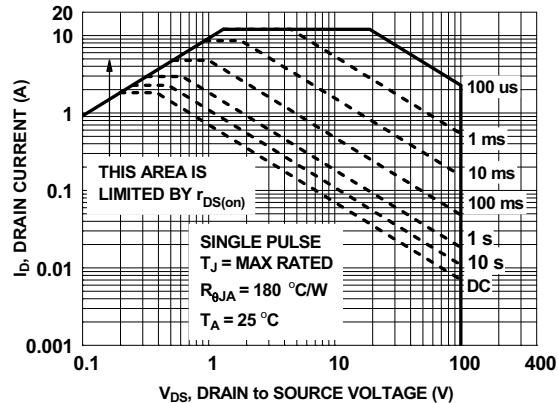
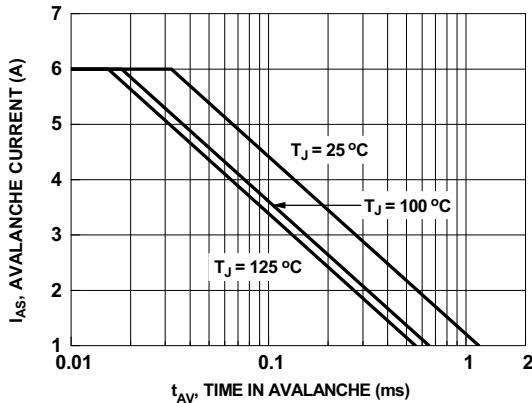
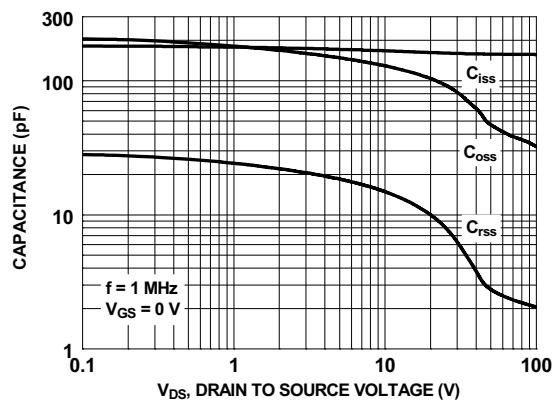
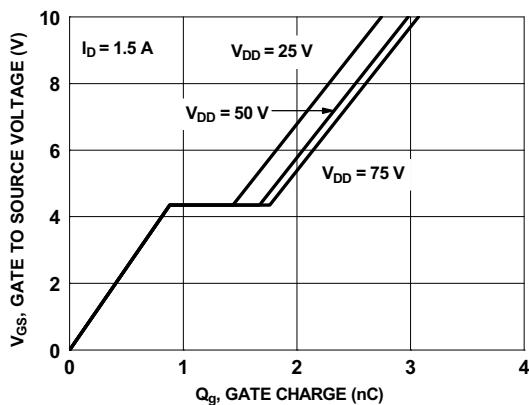


Figure 6. Source to Drain Diode Forward Voltage vs Source Current

Typical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise noted



Typical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise noted

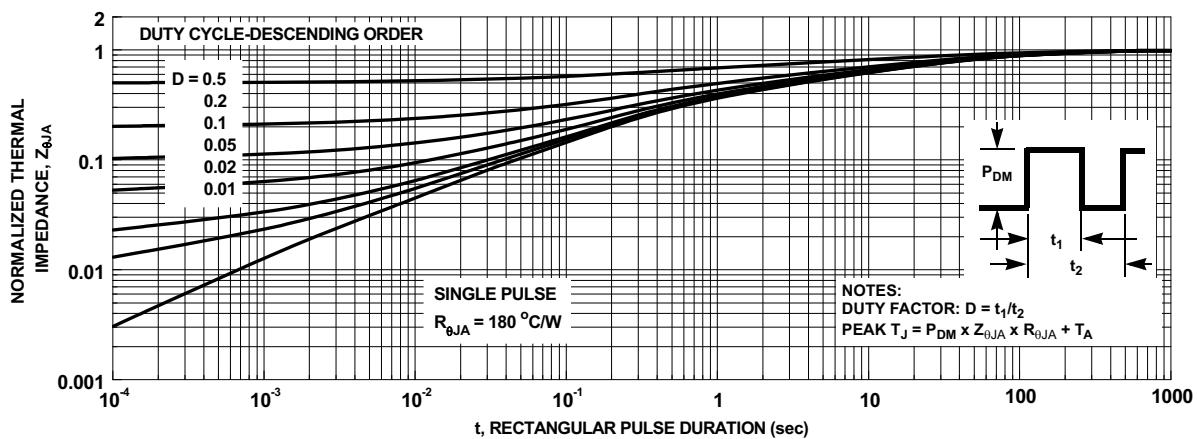


Figure 12. Junction-to-Ambient Transient Thermal Response Curve



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