

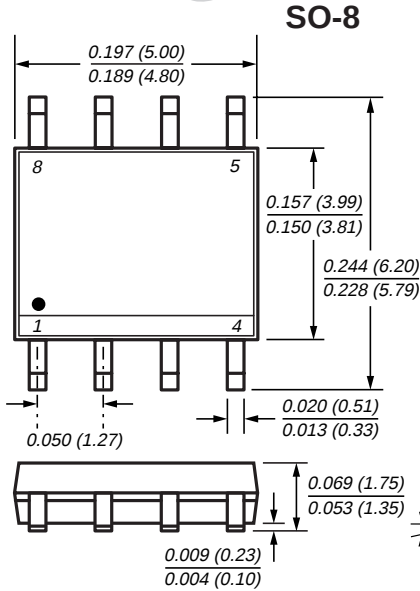
**TRENCH
GENFET®**

New Product

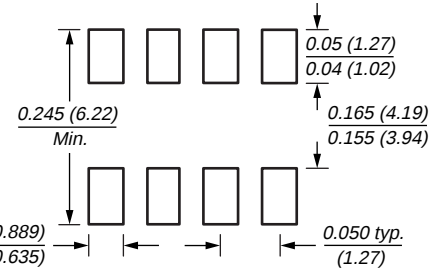
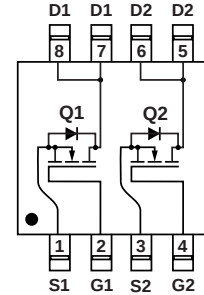
Asymmetric N-Channel Enhancement-Mode MOSFET

MOSFET 1: V_{DS} 30V $R_{DS(ON)}$ 37m Ω I_D 5.8A

MOSFET 2: V_{DS} 30V $R_{DS(ON)}$ 18m Ω I_D 7.8A



Dimensions in inches
and (millimeters)



Mounting Pad Layout

Mechanical Data

Case: SO-8 molded plastic body

Terminals: Leads solderable per MIL-STD-750, Method 2026

High temperature soldering guaranteed:
250°C/10 seconds at terminals

Mounting Position: Any

Weight: 0.5g

Features

- Advanced Trench Process Technology
- High Density Cell Design for Ultra Low On-Resistance
- Specially Designed for Low Voltage DC/DC Converters
- Fast Switching for High Efficiency
- High efficiency, optimized for PWM.

Maximum Ratings and Thermal Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	MOSFET-1	MOSFET-2	Unit
Drain-Source Voltage	V_{DS}	30	30	V
Gate-Source Voltage	V_{GS}	± 20	± 20	
Continuous Drain Current $T_J = 150^\circ\text{C}^{(1)}$	I_D	5.8	7.8	A
Pulsed Drain Current	I_{DM}	20	30	
Continuous Source Current (Diode Conduction) ⁽¹⁾	I_S	1.7	1.7	
Maximum Power Dissipation ⁽¹⁾	P_D	$T_A = 25^\circ\text{C}$ 2	$T_A = 25^\circ\text{C}$ 2	W
		$T_A = 70^\circ\text{C}$ 1.3	$T_A = 70^\circ\text{C}$ 1.3	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150		$^\circ\text{C}$
Maximum Junction-to-Ambient ⁽¹⁾ Thermal Resistance	$R_{\theta JA}$	62.5	62.5	$^\circ\text{C/W}$

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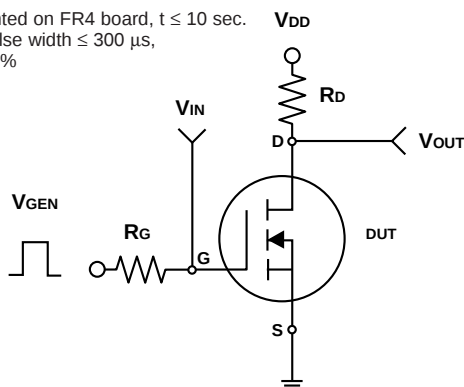
Electrical Characteristics (T_J = 25°C unless otherwise noted)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Static							
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	Q1, Q2	30	–	–	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	Q1, Q2	1.0	–	3.0	V
Gate-Body Leakage	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V	Q1, Q2	–	–	±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30V, V _{GS} = 0V	Q1, Q2	–	–	1	μA
On-State Drain Current ⁽²⁾	I _{D(on)}	V _{DS} ≥ 5V, V _{GS} = 10V	Q1 Q2	20 30	– –	– –	A
Drain-Source On-State Resistance ⁽²⁾	R _{DS(on)}	V _{GS} = 10V, I _D = 5.8A V _{GS} = 10V, I _D = 7.8A V _{GS} = 4.5V, I _D = 4.7A V _{GS} = 4.5V, I _D = 6.3A	Q1 Q2 Q1 Q2	– – – –	23.5 15.5 32.5 20.5	37 18 55 28	mΩ
Forward Transconductance ⁽²⁾	g _{fs}	V _{DS} = 15V, I _D = 5.8A V _{DS} = 15V, I _D = 7.8A	Q1 Q2	– –	16 27	– –	S
Diode Forward Voltage	V _{SD}	I _S = 1.7A, V _{GS} = 0V	Q1, Q2	–	0.75	1.2	V
Dynamic							
Total Gate Charge	Q _g	Q1 V _{DS} = 15V, V _{GS} = 5V I _D = 5.8A Q2 V _{DS} = 15V, V _{GS} = 5V I _D = 10A	Q1 Q2	– –	8.1 20	11 27	nC
Gate-Source Charge	Q _{gs}		Q1 Q2	– –	2.1 5.8	– –	
Gate-Drain Charge	Q _{gd}		Q1 Q2	– –	2.8 6.3	– –	
Turn-On Delay Time	t _{d(on)}	V _{DD} = 15V, R _L = 15Ω, I _D ≈ 1A, V _{GEN} = 10V, R _G = 6Ω	Q1 Q2	– –	7 10	14 20	ns
Rise Time	t _r		Q1 Q2	– –	6 10	12 20	
Turn-Off Delay Time	t _{d(off)}		Q1 Q2	– –	25 51	40 77	
Fall Time	t _f		Q1 Q2	– –	8 21	16 35	
Input Capacitance	C _{iss}	V _{DS} = 15V, V _{GS} = 0V f = 1.0 MHz	Q1 Q2	– –	840 1885	– –	pF
Output Capacitance	C _{oss}		Q1 Q2	– –	150 325	– –	
Reverse Transfer Capacitance	C _{rss}		Q1 Q2	– –	80 180	– –	

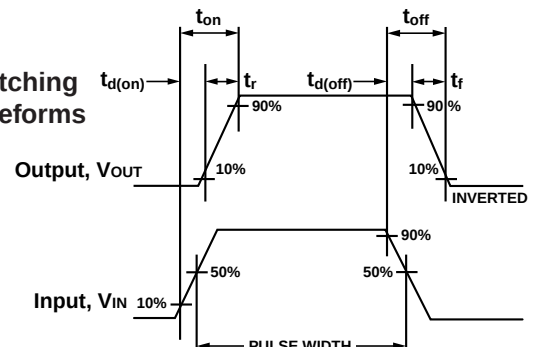
Notes: (1) Surface mounted on FR4 board, t ≤ 10 sec.

(2) Pulse test; pulse width ≤ 300 μs,
duty cycle ≤ 2%

Switching Test Circuit



Switching Waveforms



Ratings and Characteristic Curves ($T_A = 25^\circ\text{C}$ unless otherwise noted)

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Fig. 1 – Output Characteristics

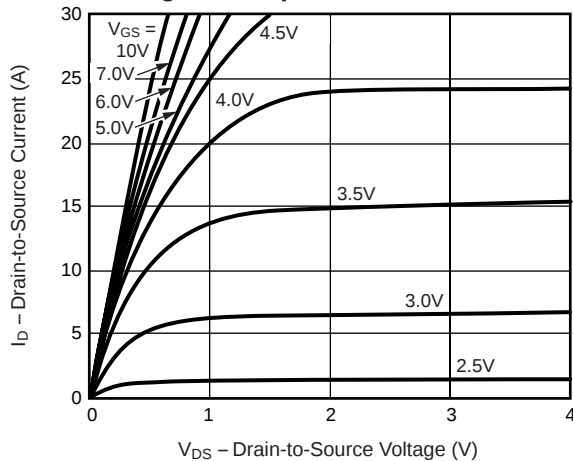
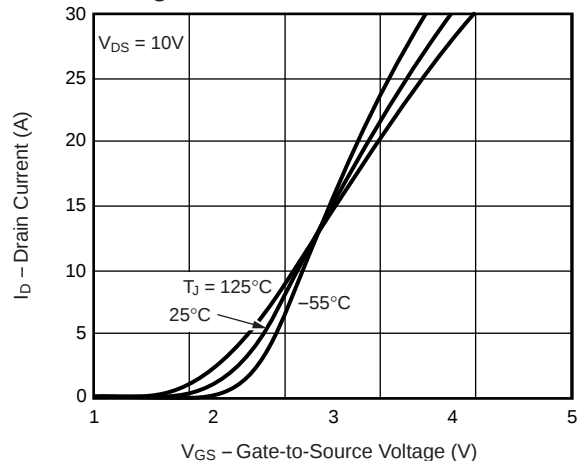
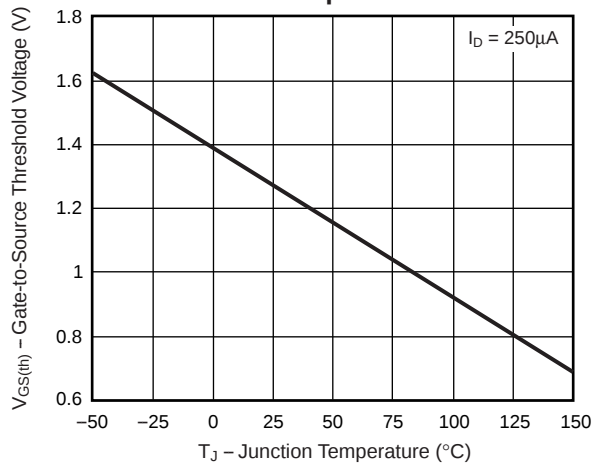


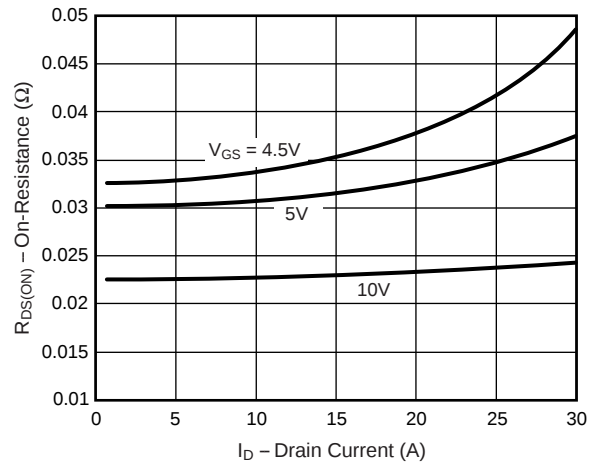
Fig. 2 – Transfer Characteristics



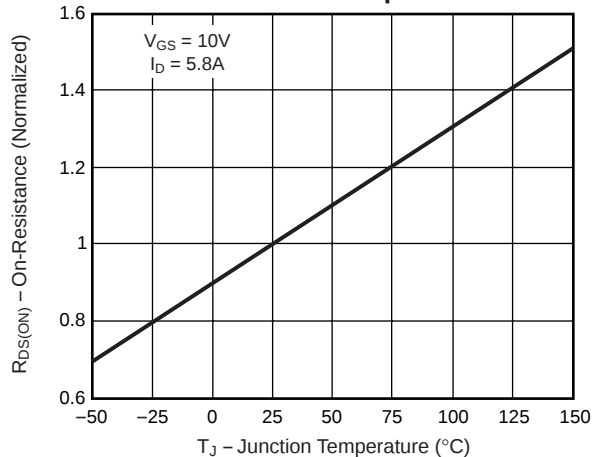
**Fig. 3 – Threshold Voltage
vs. Temperature**



**Fig. 4 – On-Resistance
vs. Drain Current**



**Fig. 5 – On-Resistance
vs. Junction Temperature**



Ratings and Characteristic Curves ($T_A = 25^\circ\text{C}$ unless otherwise noted)

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**Fig. 6 – On-Resistance
vs. Gate-to-Source Voltage**

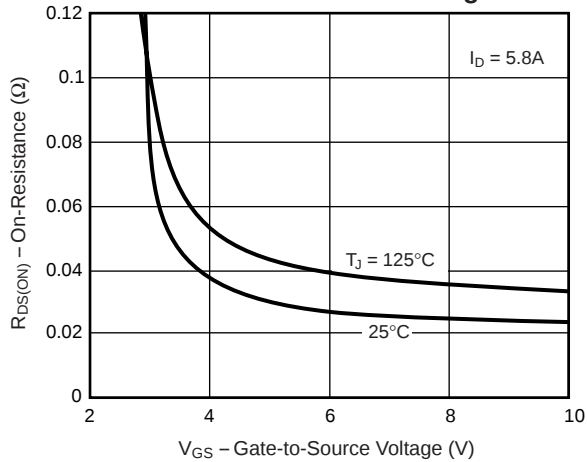


Fig. 7 – Gate Charge

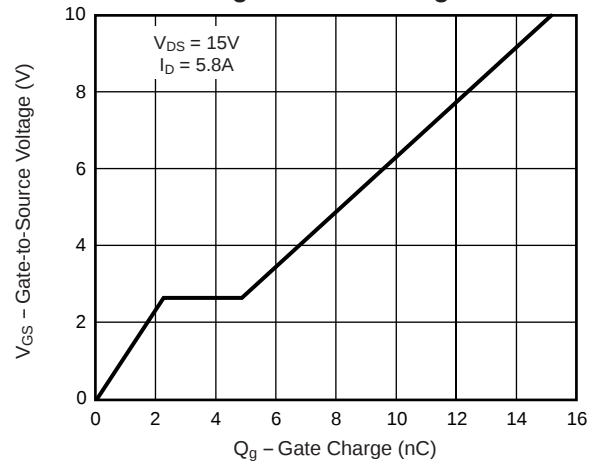
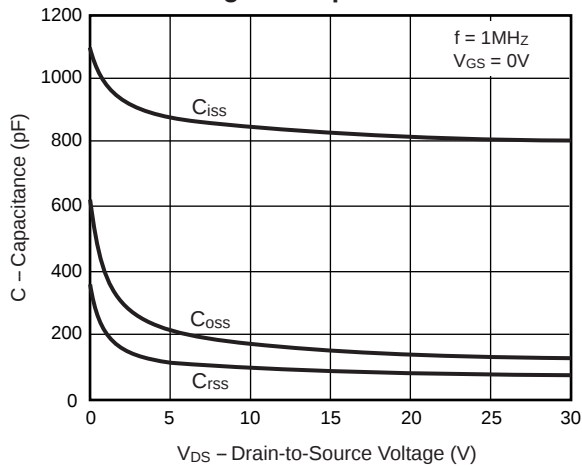
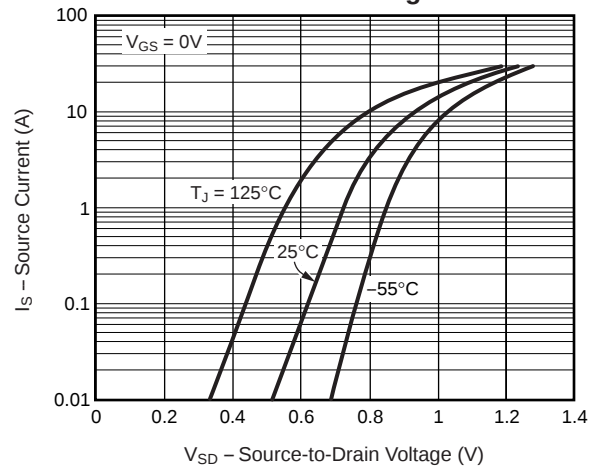


Fig. 8 – Capacitance



**Fig. 9 – Source-Drain Diode
Forward Voltage**



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Fig. 10 – Breakdown Voltage vs. Junction Temperature

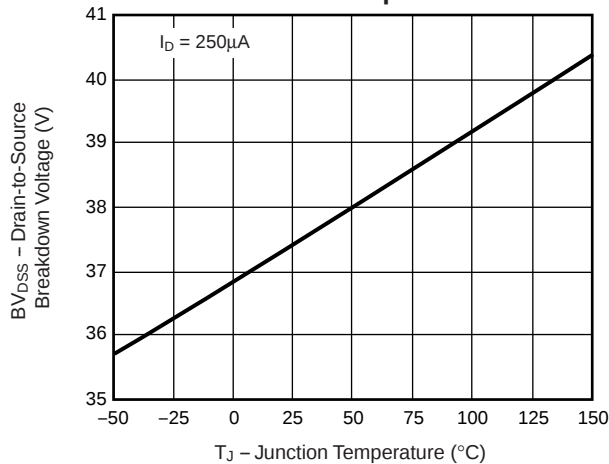


Fig. 11 – Thermal Impedance

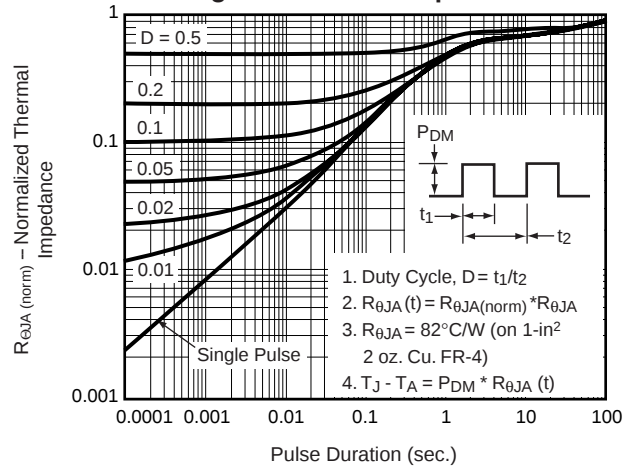


Fig. 12 – Power vs. Pulse Duration

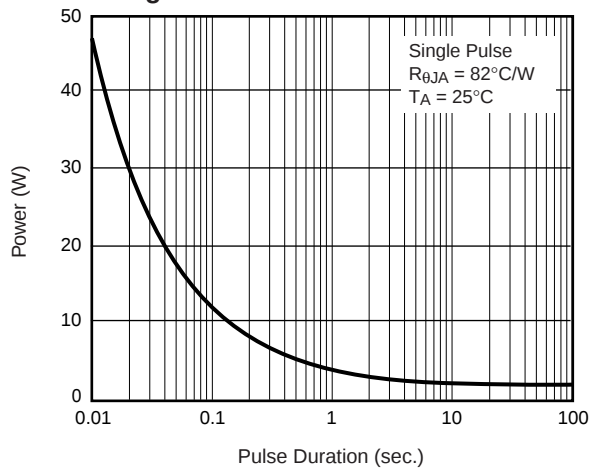
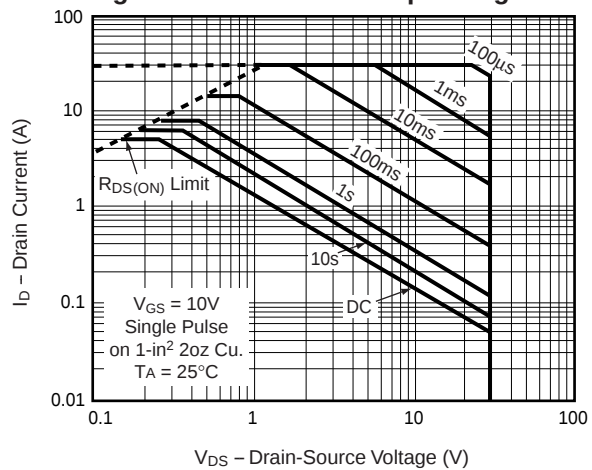


Fig. 13 – Maximum Safe Operating Area



**Ratings and
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Fig. 1 – Output Characteristics

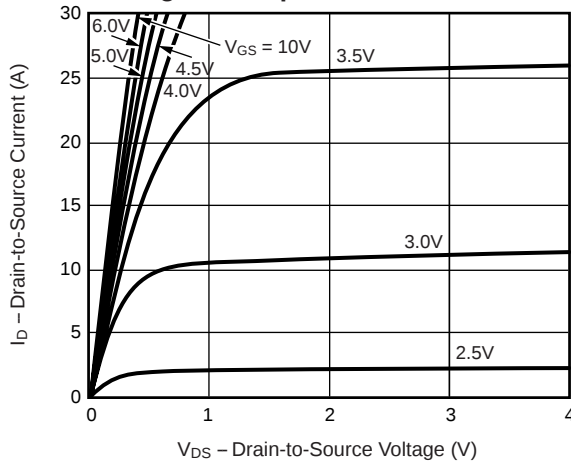
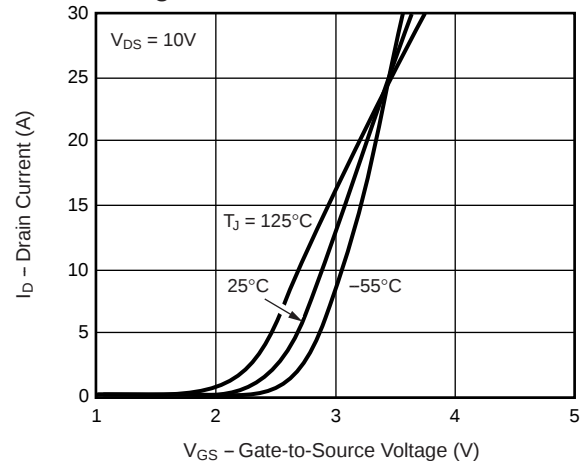
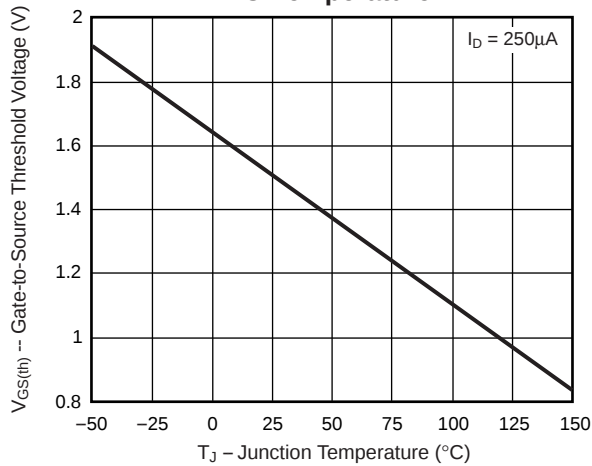


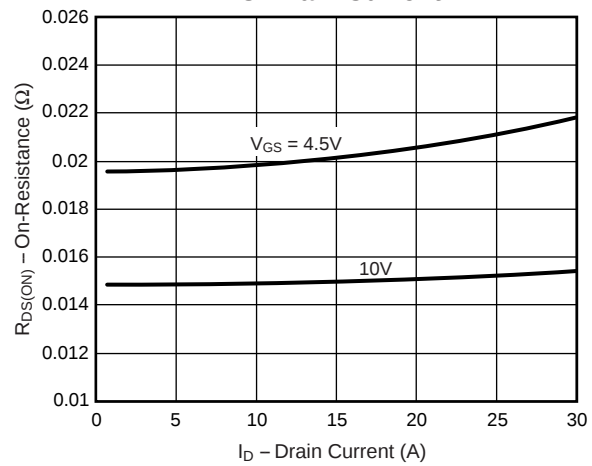
Fig. 2 – Transfer Characteristics



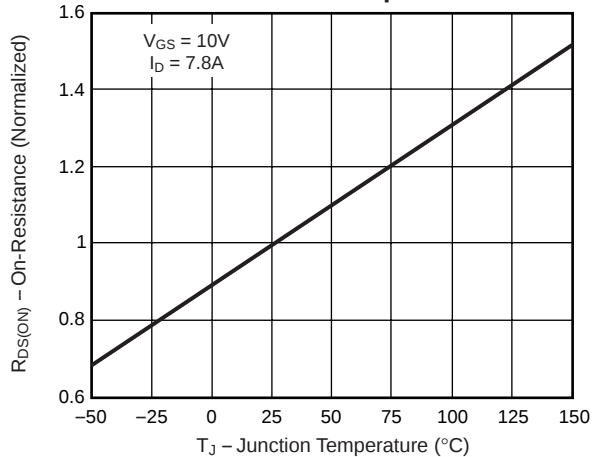
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**Fig. 4 – On-Resistance
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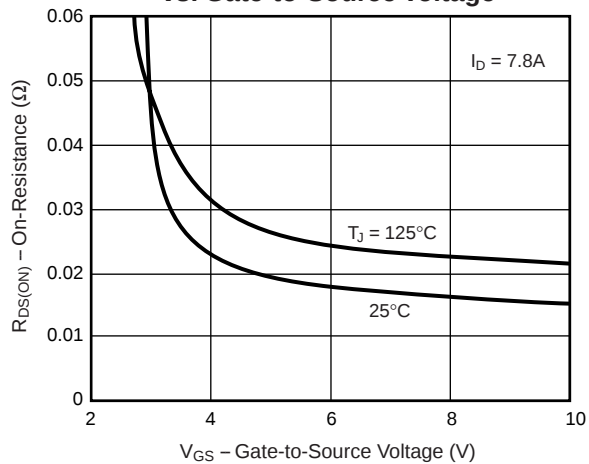


Fig. 7 – Gate Charge

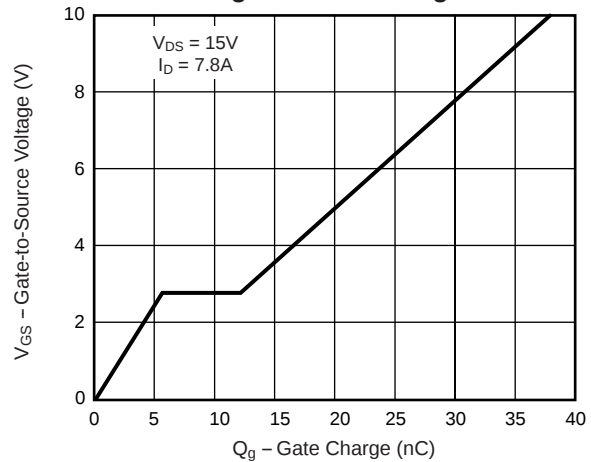
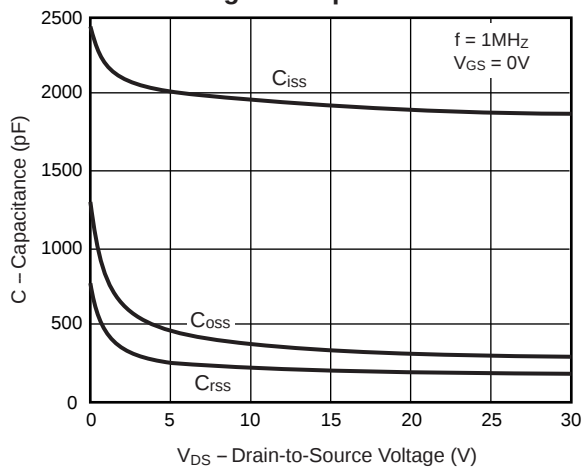
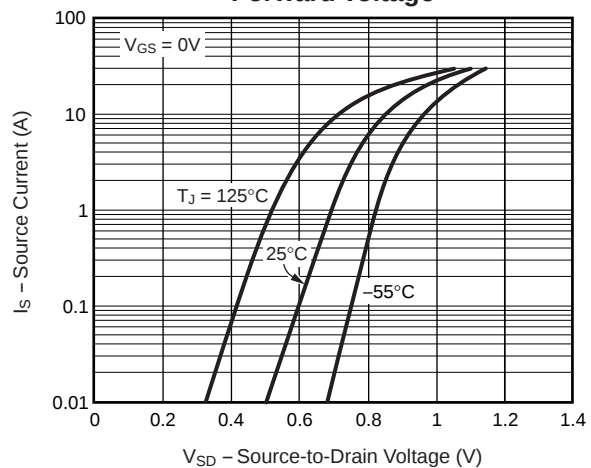


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Forward Voltage**



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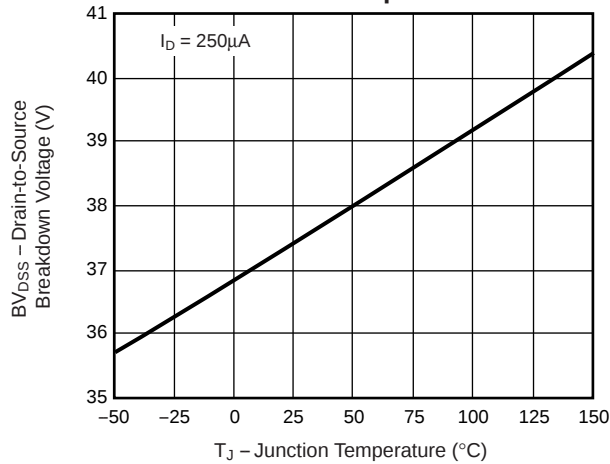


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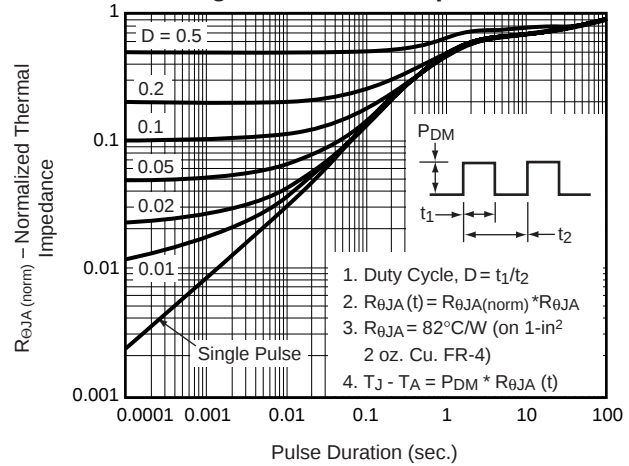


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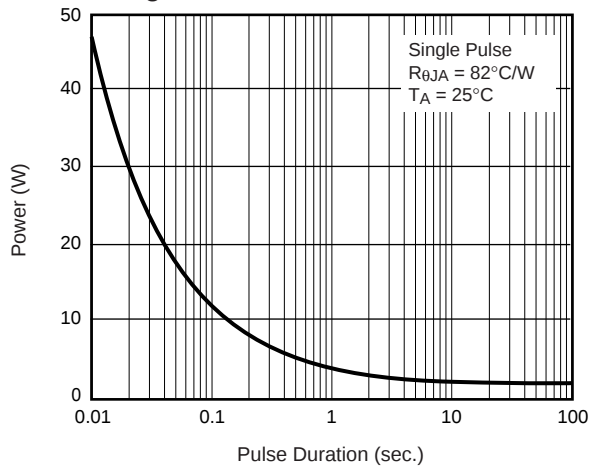


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