

Dual N-Channel 100-V (D-S) MOSFET

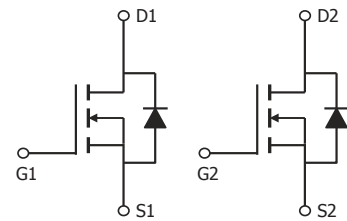
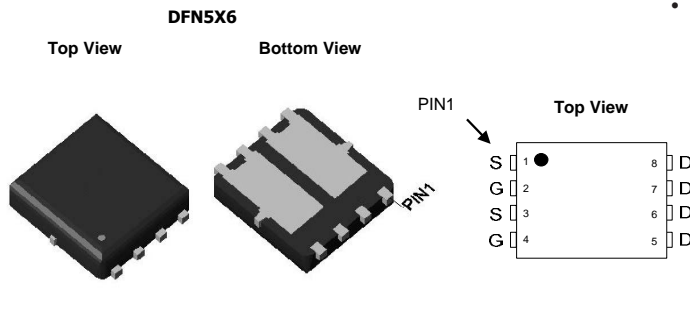
PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A) ^d	Q _g (Typ.)
100	0.148 at V _{GS} = 10 V	15	15 nC
	0.155 at V _{GS} = 4.5 V	10	

FEATURES

- TrenchFET II Power MOSFET
- 100 % R_g and UIS Tested

APPLICATIONS

- Notebook System Power
- Synchronous Buck Converter
- Notebook Vcore



N-Channel MOSFET N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T _A = 25 °C, unless otherwise noted			
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	100	V
Gate-Source Voltage	V _{GS}	± 20	
Continuous Drain Current (T _J = 150 °C)	I _D	T _C = 25 °C	15 ^a
		T _C = 70 °C	12
		T _A = 25 °C	g ^{b, c}
		T _A = 70 °C	6 ^{b, c}
Pulsed Drain Current	I _{DM}	45	A
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C	
		T _A = 25 °C	g ^{b, c}
Avalanche Current	I _{AS}	15	mJ
Single-Pulse Avalanche Energy	E _{AS}	26	
Maximum Power Dissipation	P _D	T _C = 25 °C	21
		T _C = 70 °C	16
		T _A = 25 °C	g ^{b, c}
		T _A = 70 °C	6 ^{b, c}
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^{b, d}	R _{thJA}	55	65	°C/W	
Maximum Junction-to-Foot (Drain)	R _{thJF}	16	20		

- Notes:
- Package limited.
 - Surface mounted on 1" x 1" FR4 board.
 - t = 10 s.
 - Maximum under Steady State conditions is 85 °C/W.

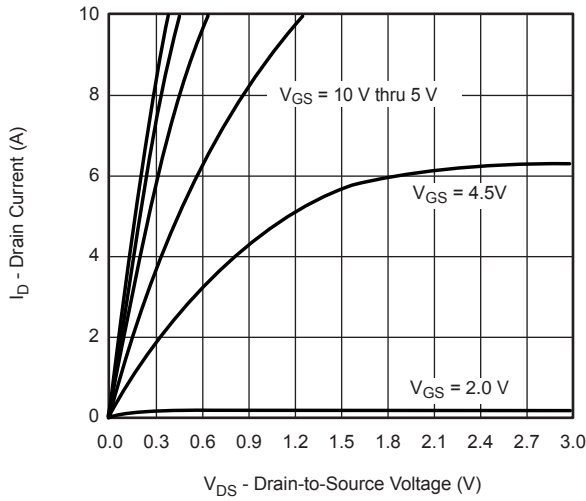
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	100			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = 250\text{ }\mu\text{A}$		55		mV/ $^\circ\text{C}$
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			-6.3		
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1		4	V
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$	15			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 5\text{ A}$		0.148	0.178	Ω
		$V_{GS} = 4.5\text{ V}, I_D = 5\text{ A}$		0.155	0.190	Ω
Forward Transconductance ^a	g_{fs}	$V_{DS} = 10\text{ V}, I_D = 5\text{ A}$		40		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		2350		pF
Output Capacitance	C_{oss}			930		
Reverse Transfer Capacitance	C_{rss}			510		
Total Gate Charge	Q_g	$V_{DS} = 80\text{ V}, V_{GS} = 10\text{ V}, I_D = 5\text{ A}$		35		nC
Gate-Source Charge	Q_{gs}			6.3		
Gate-Drain Charge	Q_{gd}			11		
Gate Resistance	R_g	$f = 1\text{ MHz}$		4.9	6.2	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 80\text{ V}, R_L = 3\text{ }\Omega$ $I_D \approx 5\text{ A}, V_{GEN} = 4.5\text{ V}, R_g = 1\text{ }\Omega$		16	19	ns
Rise Time	t_r			35	66	
Turn-Off Delay Time	$t_{d(off)}$			30	39	
Fall Time	t_f			26	31	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 80\text{ V}, R_L = 3\text{ }\Omega$ $I_D \approx 5\text{ A}, V_{GEN} = 10\text{ V}, R_g = 1\text{ }\Omega$		9	18	
Rise Time	t_r			15	15	
Turn-Off Delay Time	$t_{d(off)}$			19	28	
Fall Time	t_f			20	35	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$			15	A
Pulse Diode Forward Current ^a	I_{SM}				45	
Body Diode Voltage	V_{SD}	$I_S = 2\text{ A}$		0.7	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 4.5\text{ A}, dI/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$		26	55	ns
Body Diode Reverse Recovery Charge	Q_{rr}			26	55	nC
Reverse Recovery Fall Time	t_a			20		ns
Reverse Recovery Rise Time	t_b			7		

Notes:

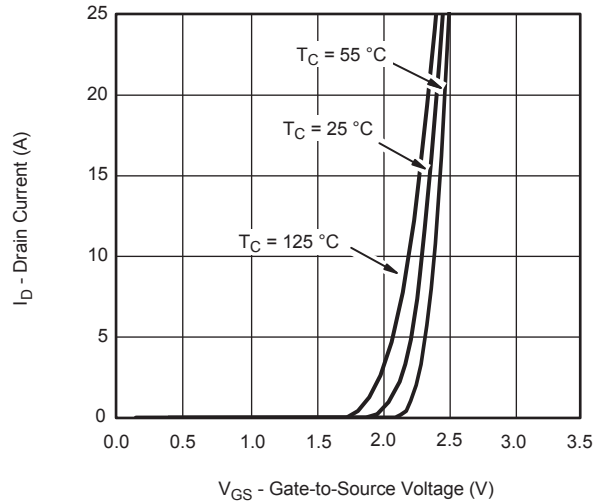
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
 b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

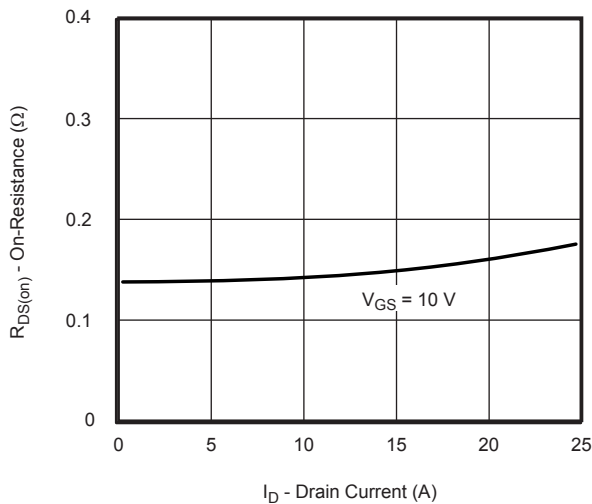
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



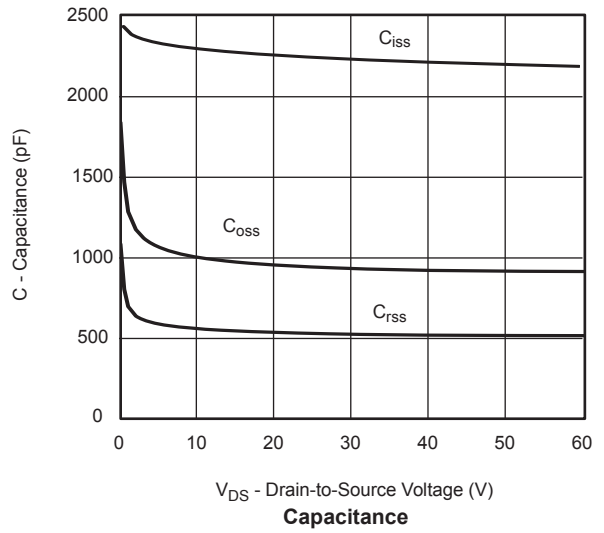
Output Characteristics



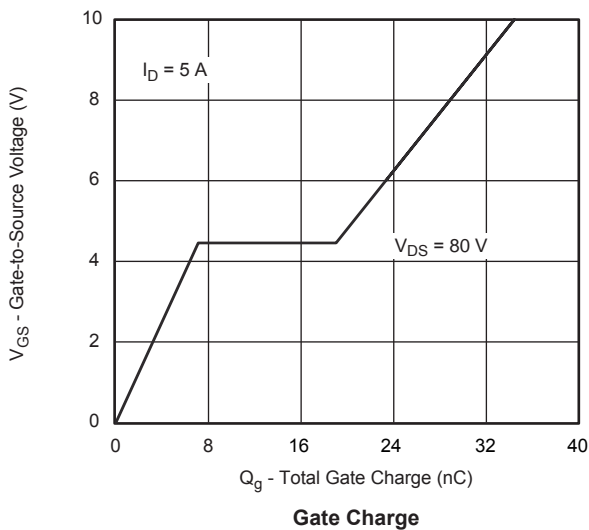
Transfer Characteristics



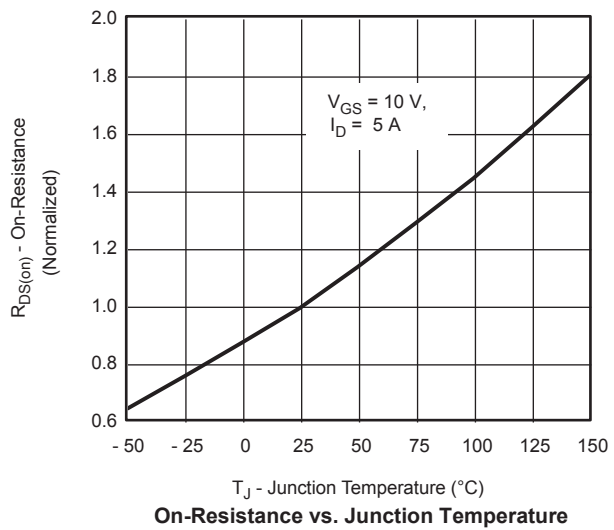
On-Resistance vs. Drain Current



Capacitance

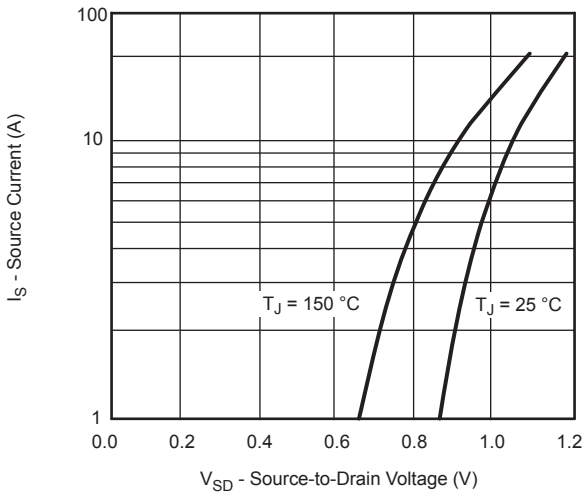


Gate Charge

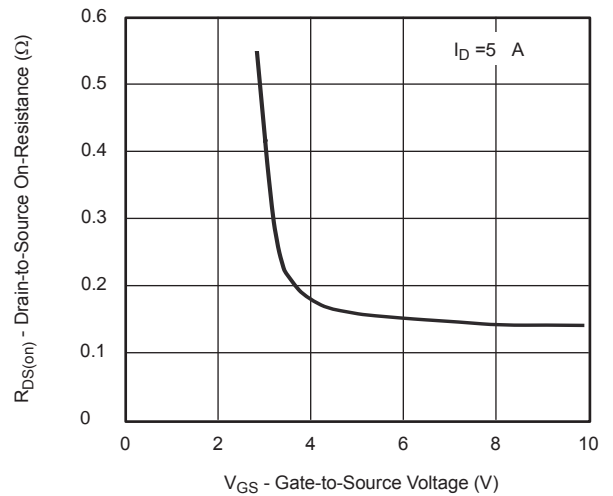


On-Resistance vs. Junction Temperature

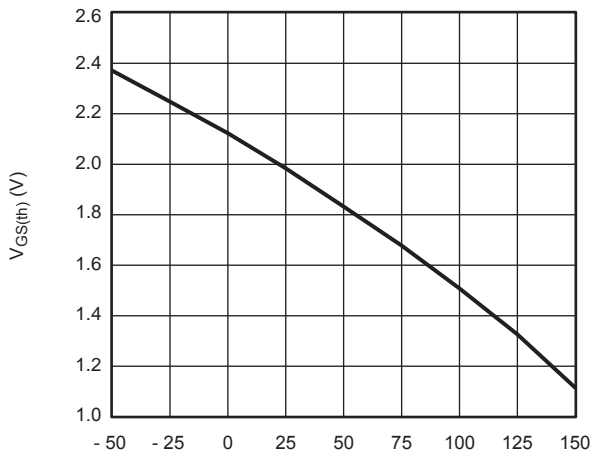
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



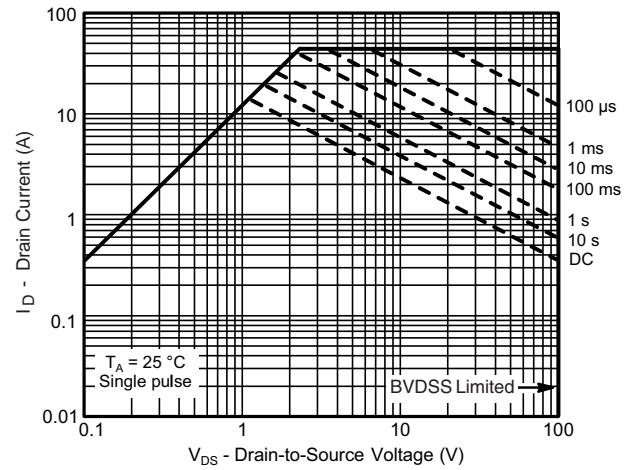
Source-Drain Diode Forward Voltage



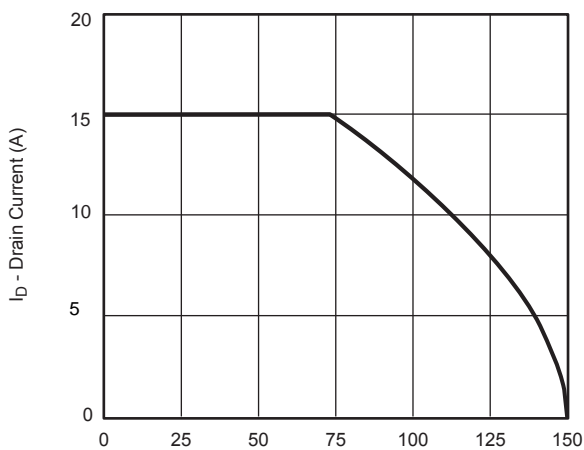
On-Resistance vs. Gate-to-Source Voltage



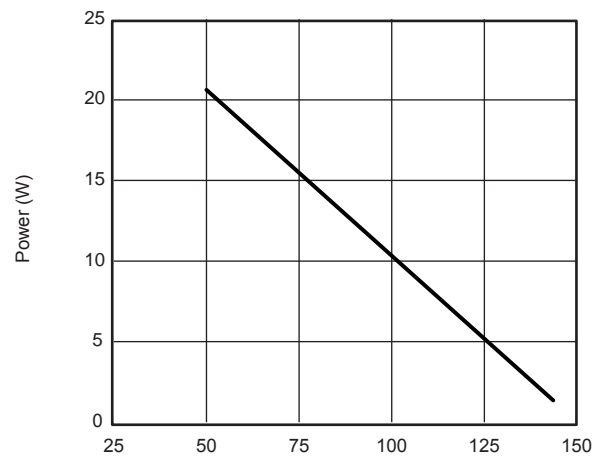
Threshold Voltage



Safe Operating Area, Junction-to-Ambient

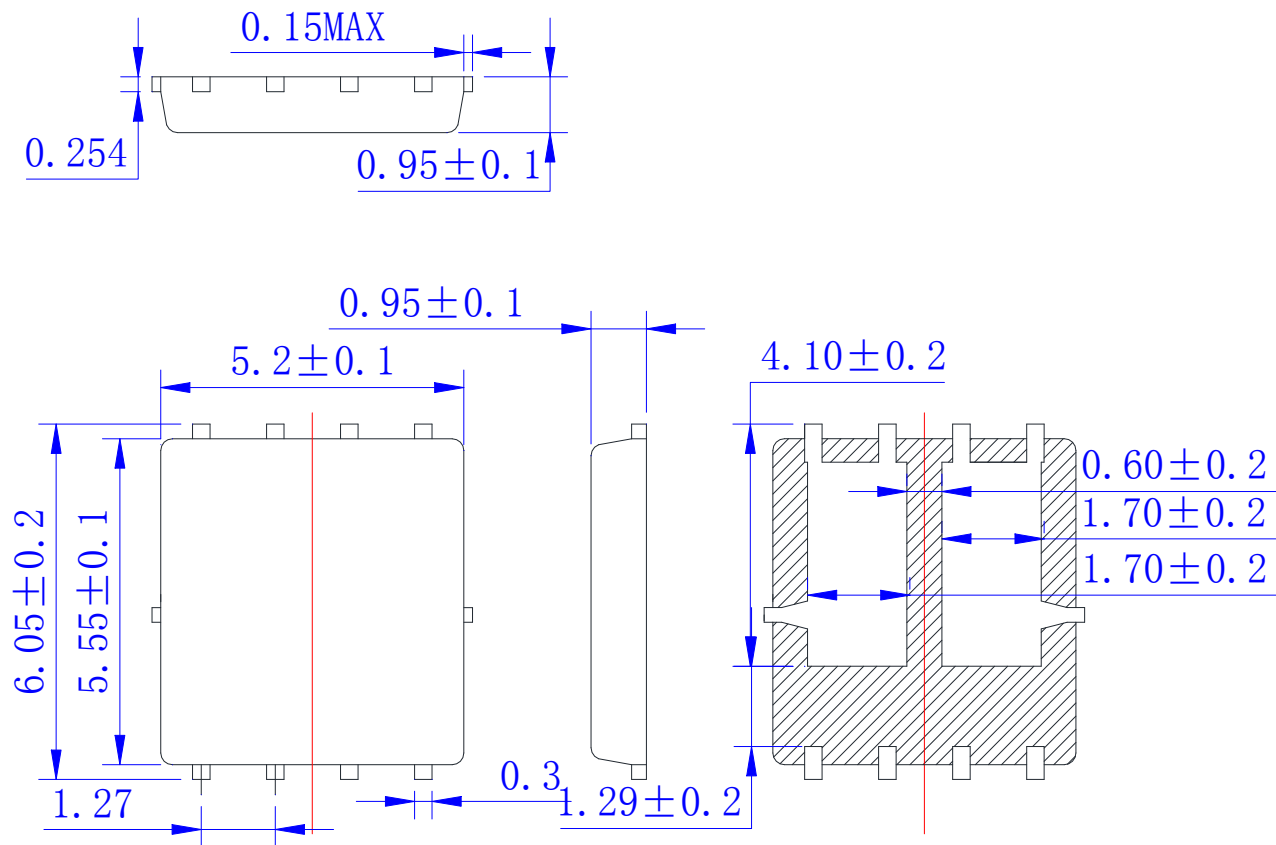


Current Derating*



Power, Junction-to-Foot

DFN5x6 PACKAGE OUTLINE



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