

N-Channel 100 V (D-S) Super Junction Power MOSFET

PRODUCT SUMMARY

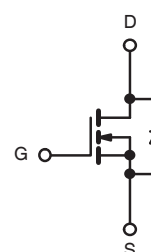
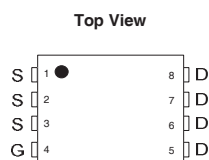
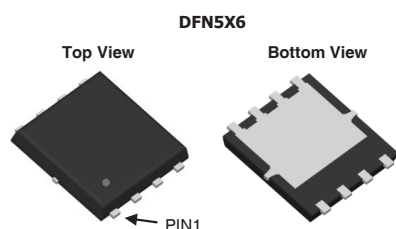
V_{DS} (V)	$R_{DS(on)}$ (m Ω)(Typ.)	I_D (A) ^a	Q_g (Typ.)
100	6 at $V_{GS} = 10$ V	55	27 nC
	10.5 at $V_{GS} = 4.5$ V	40	

FEATURES

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

APPLICATIONS

- DC/DC Primary Side Switch
- Telecom/Server 48 V, Full/Half-Bridge DC/DC
- Industrial


RoHS
 COMPLIANT


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 ($T_J = 150\text{ }^{\circ}\text{C}$)	$T_C = 25\text{ }^{\circ}\text{C}$	I_D	55	A
	$T_C = 70\text{ }^{\circ}\text{C}$		38	
	$T_A = 25\text{ }^{\circ}\text{C}$		15.6 ^{b, c}	
	$T_A = 70\text{ }^{\circ}\text{C}$		12.2 ^{b, c}	
Pulsed Drain Current ($t = 300\text{ }\mu\text{s}$)		I_{DM}	200	
Continuous Source-Drain Diode Current	$T_C = 25\text{ }^{\circ}\text{C}$	I_S	55	
	$T_A = 25\text{ }^{\circ}\text{C}$		4.5 ^{b, c}	
Single Pulse Avalanche Current	L = 0.1 mH	I_{AS}	45	
Single Pulse Avalanche Energy		E_{AS}	54	mJ
Maximum Power Dissipation	$T_C = 25\text{ }^{\circ}\text{C}$	P_D	108	W
	$T_C = 70\text{ }^{\circ}\text{C}$		69	
	$T_A = 25\text{ }^{\circ}\text{C}$		5.5 ^{b, c}	
	$T_A = 70\text{ }^{\circ}\text{C}$		3.5 ^{b, c}	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	$^{\circ}\text{C}$
Soldering Recommendations (Peak Temperature) ^{d, e}			260	

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{b, f}	R_{thJA}	20	25	°C/W
Maximum Junction-to-Case (Drain)	R_{thJC}	2.1	2.8	

Notes:

 a. Based on $T_C = 25$ °C.

b. Surface mounted on 1" x 1" FR4 board.

 c. $t = 10$ s.

d. The DFN5X6 is a leadless package. The end of the lead terminal is exposed copper

(not plated) as a result of the singulation process in manufacturing. A solder fillet at the exposed copper tip cannot be guaranteed and is not required to ensure adequate bottom side solder interconnection.

e. Rework conditions: manual soldering with a soldering iron is not recommended for leadless components.

f. Maximum under steady state conditions is 70 °C/W.

SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0, I _D = 250 μA	100			V
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	I _D = 250 μA		64		mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J			- 5.8		
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1.5		3.5	V
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 100 V, V _{GS} = 0 V			1	μA
		V _{DS} = 64 V, V _{GS} = 0 V, T _J = 55 °C			10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 10 V	55			A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 15 A		6	7.5	mΩ
		V _{GS} = 4.5 V, I _D = 10 A		10.5	15.9	
Forward Transconductance ^a	g _{fs}	V _{DS} = 10 V, I _D = 15 A		65		S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{DS} = 50 V, V _{GS} = 0 V, f = 1 MHz		1610		pF
Output Capacitance	C _{oss}			359		
Reverse Transfer Capacitance	C _{rss}			40		
Total Gate Charge	Q _g	V _{DS} = 50 V, V _{GS} = 10 V, I _D = 10 A		27		nC
Gate-Source Charge	Q _{gs}			4.3		
Gate-Drain Charge	Q _{gd}			7.2		
Gate Resistance	R _g	f = 1 MHz	0.2	1.05	2.1	Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = 50 V, R _L = 5 Ω I _D ≅ 10 A, V _{GEN} = 10 V, R _g = 1 Ω		19		ns
Rise Time	t _r			11		
Turn-Off Delay Time	t _{d(off)}			45		
Fall Time	t _f			8		
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C			55	A
Pulse Diode Forward Current ^a	I _{SM}				200	
Body Diode Voltage	V _{SD}	I _S = 1 A		0.7	1	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 10 A, dI/dt = 100 A/μs, T _J = 25 °C		56		ns
Body Diode Reverse Recovery Charge	Q _{rr}			38		nC
Reverse Recovery Fall Time	t _a			22		ns
Reverse Recovery Rise Time	t _b			15		

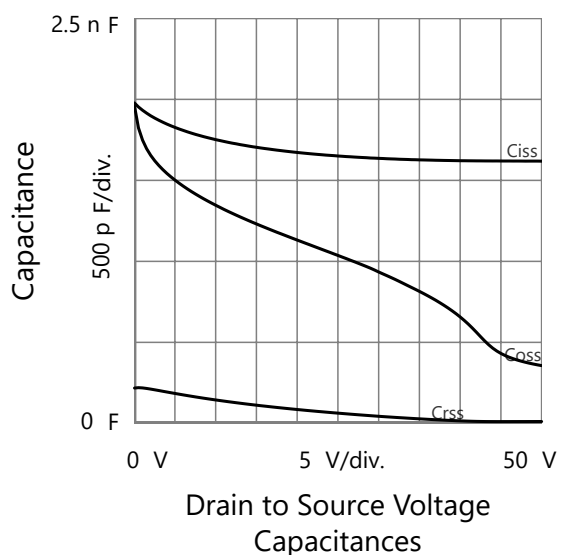
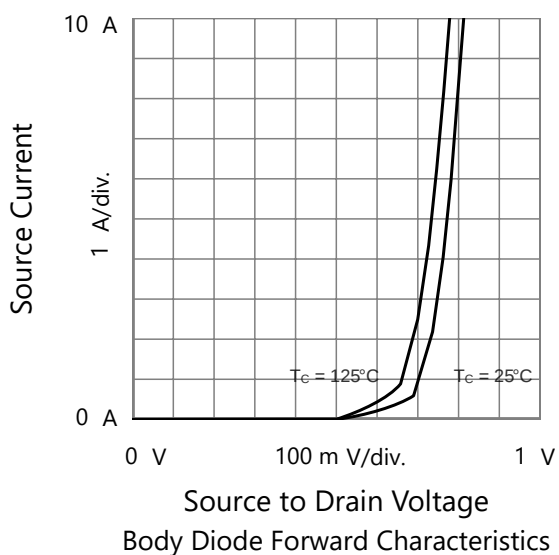
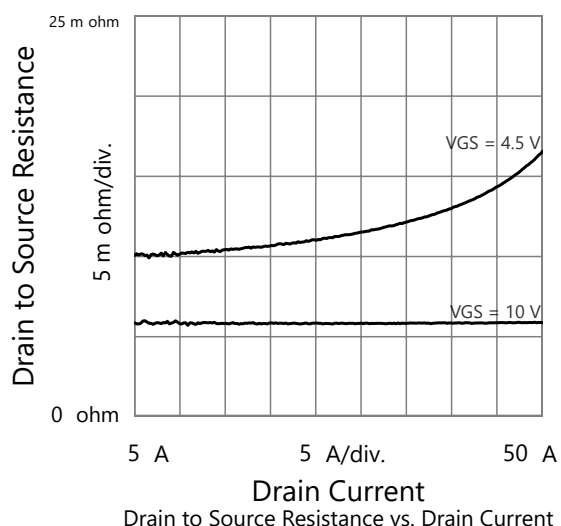
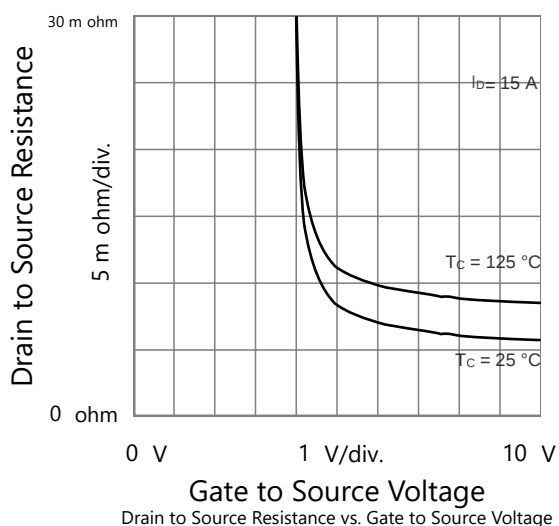
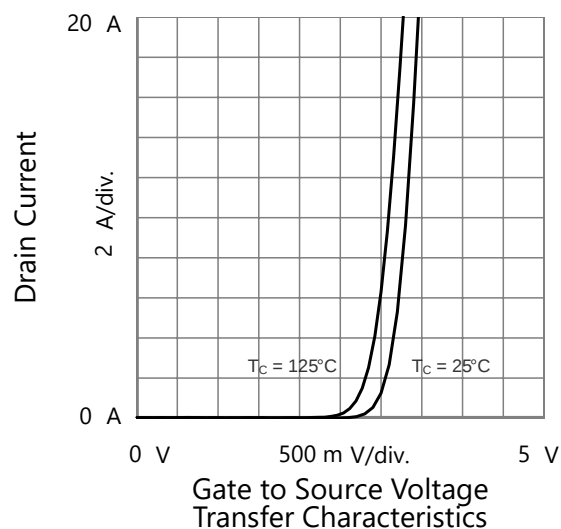
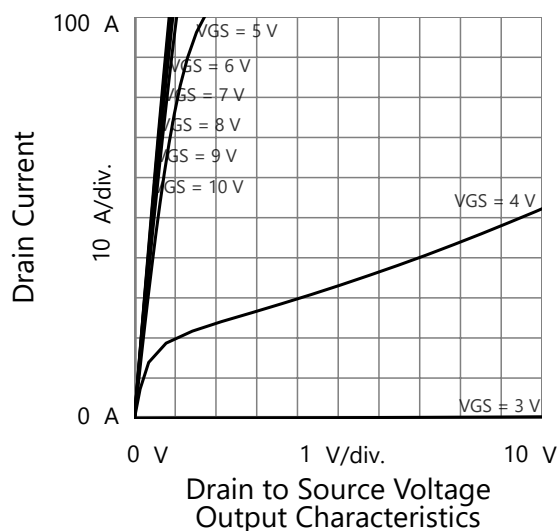
Notes:

 a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

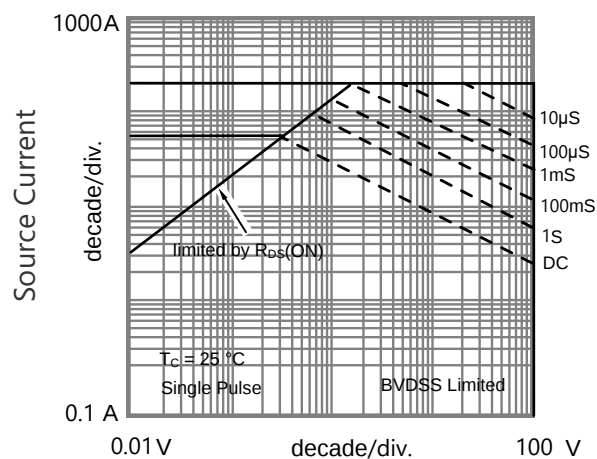
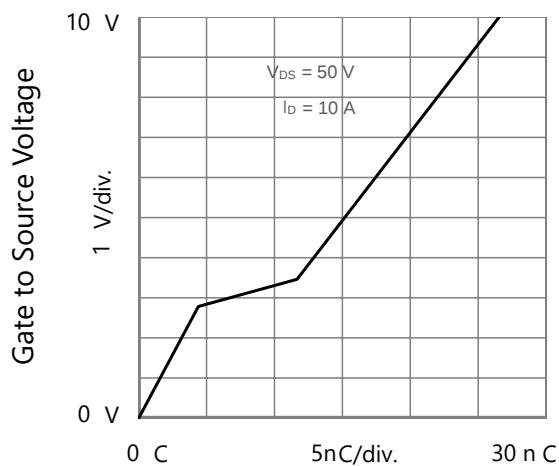
b. Guaranteed by design, not subject to production testing.

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.

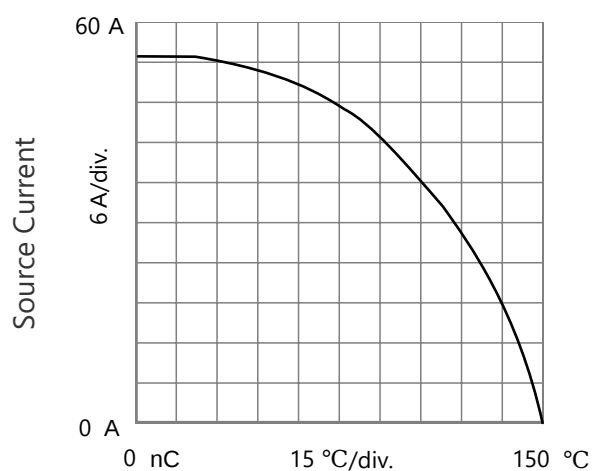
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



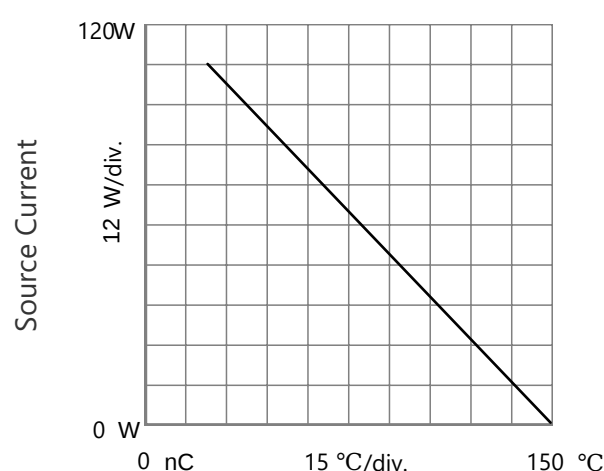
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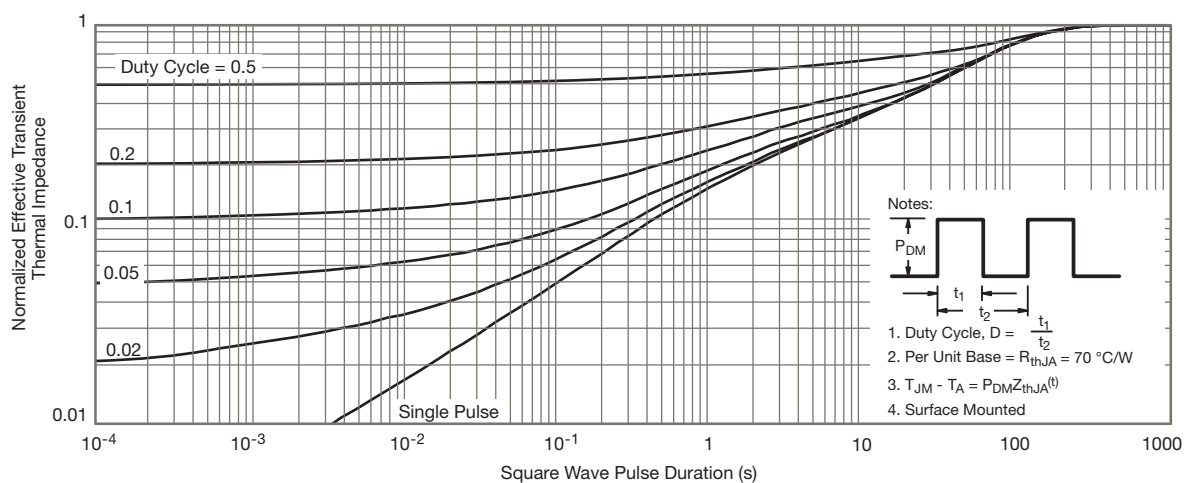
Safe Operating Area, Junction-to-Ambient



Current Derating



Current Derating



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