

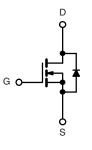
RoHS COMPLIANT

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

PRODUCT SUMMARY				
V _{DS} (V)	R_{DS(on)} (Ω)	I _D (A) ^a	Q _g (Typ.)	
100	0.0185 at V _{GS} = 10 V	60	38 nC	

G D S

TO-252



FEATURES

- TrenchFET[®] Power MOSFET
- 100 % R_q and UIS Tested

APPLICATIONS

- Primary Side Switch
- Isolated DC/DC Converter

Top View	N-Channel MOSFET				
ABSOLUTE MAXIMUM RATING	S (T _A = 25 °C, unle	ss otherwise not	ted)		
Parameter		Symbol	Limit	Unit	
		V _{DS}	100	V	
Gate-Source Voltage		V _{GS}	± 20	v	
	T _C = 25 °C		60 ^a		
Continuous Drain Current (T _J = 150 °C)	T _C = 100 °C	1-	45		
Continuous Drain Current (1) = 150°C)	T _A = 25 °C	ID	9.2 ^b		
	T _A = 100 °C		6.8 ^b	A	
Pulsed Drain Current		I _{DM}	140		
Continuous Source-Drain Diode Current	T _C = 25 °C		60 ^a		
Continuous Source-Drain Diode Current	T _A = 25 °C	I _S	2 ^b		
Single Pulse Avalanche Current	L = 0.1 mH	I _{AS}	45		
Avalanche Energy	L = 0.1 mm	E _{AS}	101	mJ	
	T _C = 25 °C		136.4		
Maximum Power Dissipation	T _C = 100 °C	в	68.2	w	
	T _A = 25 °C	P _D	3 ^b		
	T _A = 100 °C		1.5 ^b		
Operating Junction and Storage Temperature Range		T _J , T _{stg}	- 55 to 175	°C	

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^b	Steady State	R _{thJA}	40	50	°C/W
Maximum Junction-to-Case	Sleady Slale	R _{thJC}	0.85	1.1	0/W

Notes:

a. Package limited.

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

Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static							
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 \text{ V}, \text{ I}_{D} = 250 \mu\text{A}$	100			V	
V _{DS} Temperature Coefficient	$\Delta V_{DS}/T_{J}$	L 050 HA		110		mV/°C	
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	I _D = 250 μΑ		- 12.5			
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_D = 250 \ \mu A$	2.5		5	V	
Gate-Source Leakage	I _{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA	
		$V_{DS} = 100 \text{ V}, V_{GS} = 0 \text{ V}$	1				
Zero Gate Voltage Drain Current	IDSS	V_{DS} = 100 V, V_{GS} = 0 V, T_{J} = 125 °C			50	μΑ	
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \ge 5 \text{ V}, \text{ V}_{GS} = 10 \text{ V}$	50			А	
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 15 A			0.0185	Ω	
Forward Transconductance ^a	9 _{fs}	V _{DS} = 15 V, I _D = 15 A		33		S	
Dynamic ^b							
Input Capacitance	C _{iss}			2400		pF	
Output Capacitance	C _{oss}	V _{DS} = 50 V, V _{GS} = 0 V, f = 1 MHz		230			
Reverse Transfer Capacitance	C _{rss}			80			
Total Gate Charge	Qg			38	70	nC	
Gate-Source Charge	Q _{gs}	$V_{DS} = 50 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 50 \text{ A}$		14			
Gate-Drain Charge	Q _{gd}			12			
Gate Resistance	Rg	f = 1 MHz		1.6	2.5	Ω	
Turn-On Delay Time	t _{d(on)}			12	20		
Rise Time	t _r	V_{DD} = 50 V, R_L = 1 Ω		10	20		
Turn-Off Delay Time	t _{d(off)}	$I_D \cong 50$ Å, $V_{GEN} = 10$ V, $R_g = 1$ Ω		18	35	- ns	
Fall Time	t _f			8	15		
Drain-Source Body Diode Characteris	stics						
Continuous Source-Drain Diode	ا _S	T _C = 25 °C			50	•	
Pulse Diode Forward Currenta	I _{SM}				100	A	
Body Diode Voltage	V _{SD}	I _S = 15 A		0.85	1.5	V	
Body Diode Reverse Recovery Time	t _{rr}			80	120	ns	
Body Diode Reverse Recovery Charge	Q _{rr}			160	240	nC	
Reverse Recovery Fall Time	t _a	$I_F = 50 \text{ A}, \text{ dI/dt} = 100 \text{ A/}\mu\text{s}, \text{ T}_J = 25 ^\circ\text{C}$		57			
Reverse Recovery Rise Time	t _b			23	1	ns	

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Notes:

a. Pulse test; pulse width \leq 300 µs, 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.



T_C = - 55 °C

8

10

6

T_C = 25 °C

4

V_{GS} - Gate-to-Source Voltage (V)

Transfer Characteristics

V_{GS} = 10 V

40

I_D - Drain Current (A)

On-Resistance vs. Drain Current

Ciss

60

80

100

T_C = 125 °C

2

20

Coss

40

V_{DS} - Drain-to-Source Voltage (V)

Capacitance

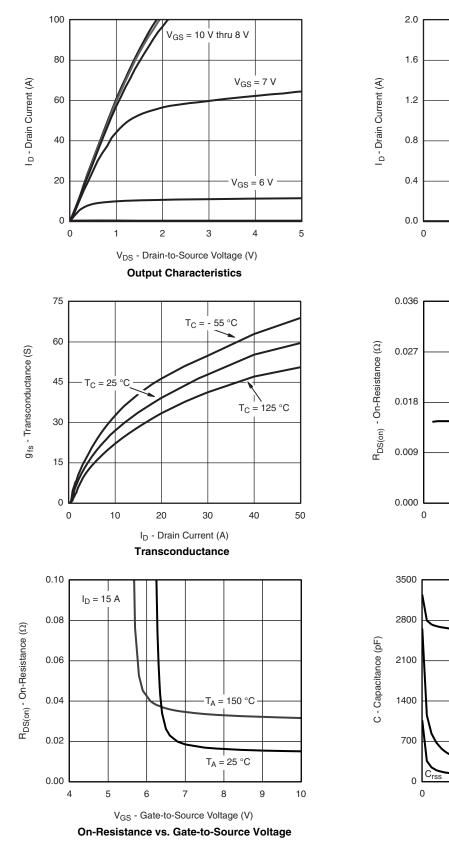
60

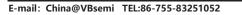
80

100

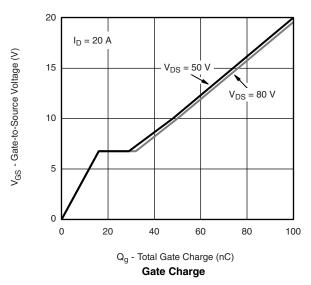
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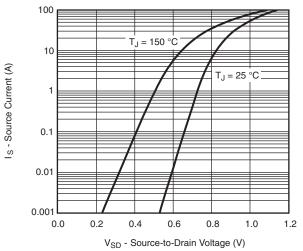
TYPICAL CHARACTERISTICS (25 °C, unless otherwise note)

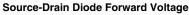


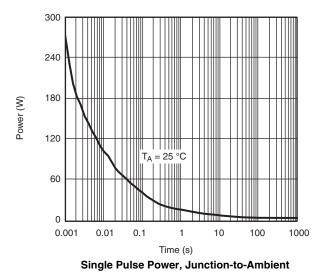


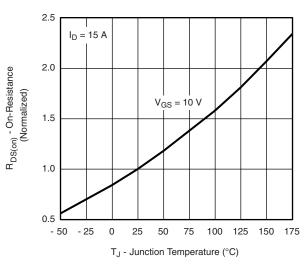




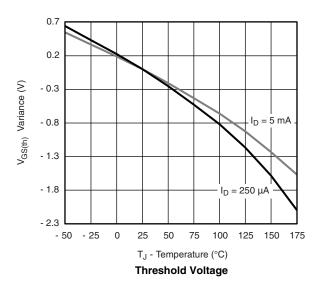


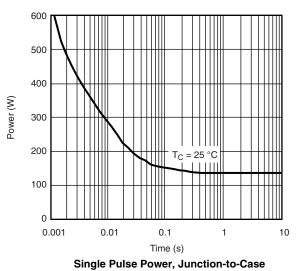




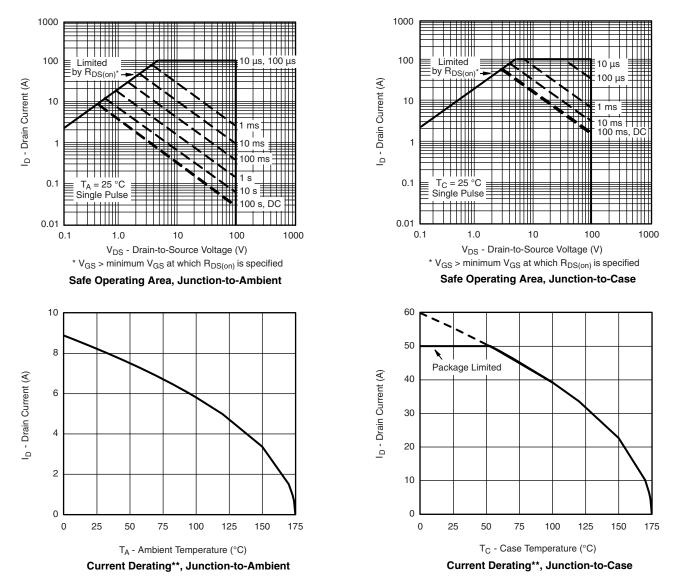


On-Resistance vs. Junction Temperature

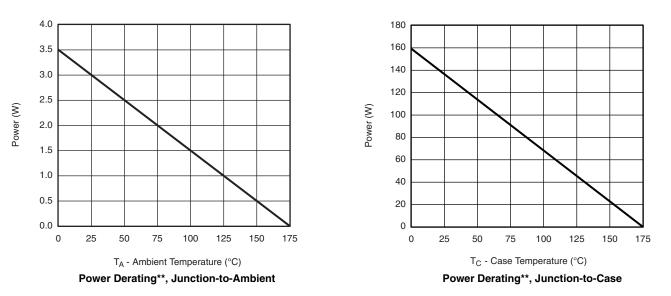






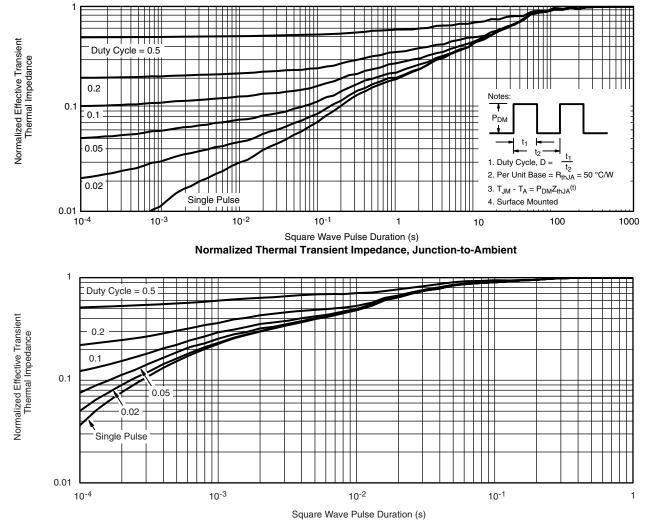


** The power dissipation P_D is based on $T_{J(max.)} = 175$ °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.



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Normalized Thermal Transient Impedance, Junction-to-Case



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