

N-Channel 100 V (D-S) MOSFET

PRODUCT SUMMARY				
V _{DS} (V)	$R_{DS(on)}(\Omega)$	I _D (A)		
100	0.110 at V _{GS} = 10 V	15		
100	0.115 at V _{GS} = 6 V	15		

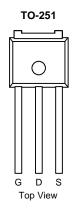
FEATURES

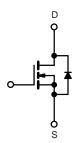
- DT-Trench Power MOSFET
- 175 °C Junction Temperature
- 100 % R_g Tested



APPLICATIONS

· Primary Side Switch





N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _C = 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 = 175 °C) ^b	T _C = 25 °C	I.	15			
	T _C = 125 °C	- I _D	8.7			
Pulsed Drain Current		I _{DM}	45	А		
Continuous Source Current (Diode Conduction)		I _S	15			
Avalanche Current	I _{AR}	15				
Repetitive Avalanche Energy (Duty Cycle ≤ 1 %)	L = 0.1 mH	E _{AR}	11.3	mJ		
Maximum Power Dissipation	T _C = 25 °C	P _D	61 ^b	W		
	T _A = 25 °C	'D	2.7 ^a	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		
Operating Junction and Storage Temperature Range		T _J , T _{stg}	- 55 to 175	°C		

THERMAL RESISTANCE RATINGS						
Parameter		Symbol	Typical	Maximum	Unit	
hungtion to Ambienta	t ≤ 10 s	- R _{thJA}	16	20	°C/W	
Junction-to-Ambient ^a	Steady State		45	55		
Junction-to-Case		R _{thJC}	2	2.4		

Notes:

- a. Surface mounted on 1" x 1" FR4 board.
- b. See SOA curve for voltage derating.

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Parameter	Symbol	Test Conditions	Min.	Typ. ^a	Max.	Unit	
Static					l		
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 \text{ V, } I_{D} = 250 \mu\text{A}$				V	
Gate Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	1.0		3.0	V	
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA	
		V _{DS} = 100 V, V _{GS} = 0 V			1		
Zero Gate Voltage Drain Current	I_{DSS}	V _{DS} = 100 V, V _{GS} = 0 V, T _J = 125 °C			50	μΑ	
		V _{DS} = 100 V, V _{GS} = 0 V, T _J = 175 °C			250	1	
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	15			Α	
		V _{GS} = 10 V, I _D = 15 A		0.110			
5	D	V _{GS} = 10 V, I _D = 15 A, T _J = 125 °C		0.170			
Drain-Source On-State Resistance ^b	R _{DS(on)}	V _{GS} = 10 V, I _D = 15 A, T _J = 175 °C		0.230		Ω	
		V _{GS} = 6 V, I _D = 10 A		0.115			
Forward Transconductance ^b	9 _{fs}	V _{DS} = 15 V, I _D = 15 A		25		S	
Dynamic ^a							
Input Capacitance	C _{iss}			892		pF	
Output Capacitance	C _{oss}	$V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$		110			
Reverse Transfer Capacitance	C _{rss}			70			
Total Gate Charge ^c	Qg			20	25		
Gate-Source Charge ^c	Q _{gs}	$V_{DS} = 75 \text{ V}, V_{GS} = 10 \text{ V}, I_{D} = 15 \text{ A}$		5.5		nC	
Gate-Drain Charge ^c	Q _{gd}			7			
Gate Resistance	R _g		1		3.2	Ω	
Turn-On Delay Time ^c	t _{d(on)}			8	12		
Rise Time ^c	t _r	$V_{DD} = 75 \text{ V}, R_L = 5 \Omega$		35	55	nc	
Turn-Off Delay Time ^c	t _{d(off)}	$I_D \cong 15 \text{ A}, V_{GEN} = 10 \text{ V}, R_G = 2.5 \Omega$		17	25	ns	
Fall Time ^c	t _f			30	45		
Source-Drain Diode Ratings and Cha	racteristic (T	_C = 25 °C)					
Pulsed Current	I _{SM}				45	Α	
Diode Forward Voltage ^b	V_{SD}	$I_F = 15 \text{ A}, V_{GS} = 0 \text{ V}$		0.9	1.5	V	
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 15 A, dl/dt = 100 A/μs		55	85	ns	

Notes:

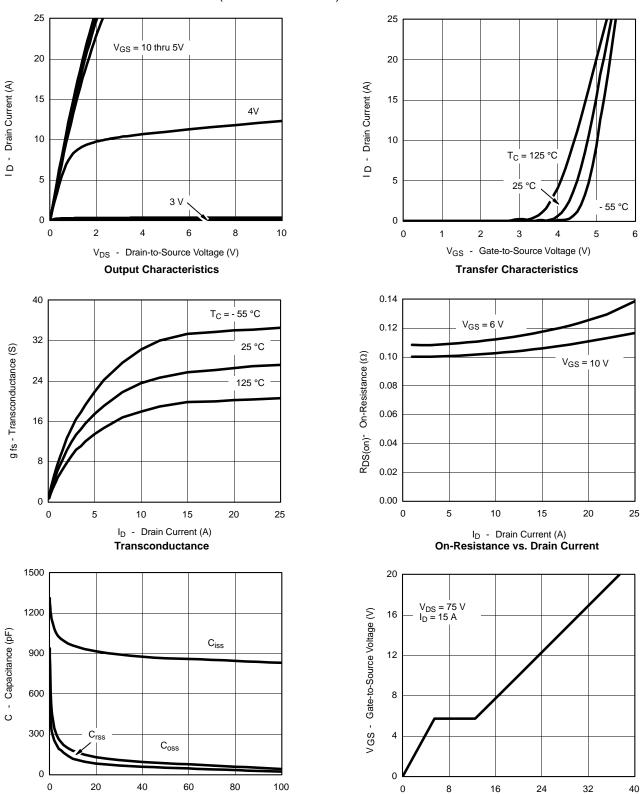
- a. Guaranteed by design, not subject to production testing.
- b. Pulse test; pulse width $\leq 300~\mu s,$ duty cycle $\leq 2~\%.$
- c. Independent of operating temperature.

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.

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TYPICAL CHARACTERISTICS (25 °C unless noted)



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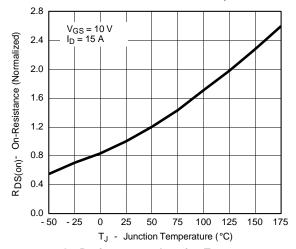
V_{DS} - Drain-to-Source Voltage (V) **Capacitance**

 $Q_g\,$ - Total Gate Charge (nC)

Gate Charge

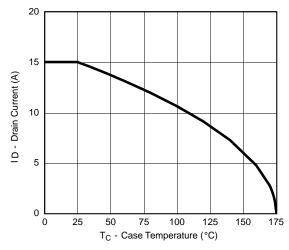


TYPICAL CHARACTERISTICS (25 °C unless noted)



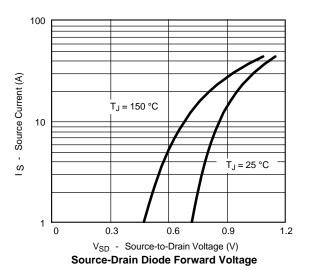
On-Resistance vs. Junction Temperature

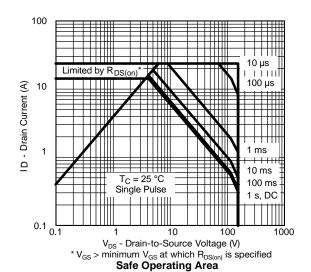
THERMAL RATINGS



Maximum Avalanche Drain Current vs. Case Temperature

10-3





10-1 1 10

Square Wave Pulse Duration (sec)
Normalized Thermal Transient Impedance, Junction-to-Case

2

Normalized Effective Transient Thermal Impedance

0.1

0.01

10-4

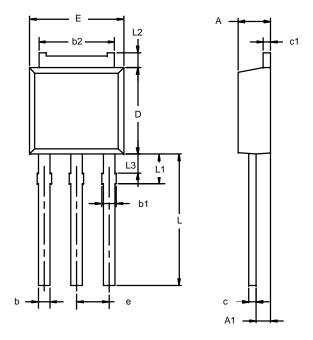
Duty Cycle = 0.5

0.05 Single Pulse

0.2



TO-251AA (DPAK)



	MILLIM	IETERS	INCHES		
Dim	Min	Max	Min	Max	
Α	2.21	2.38	0.087	0.094	
A 1	0.89	1.14	0.035	0.045	
b	0.71	0.89	0.028	0.035	
b1	0.76	1.14	0.030	0.045	
b2	5.23	5.43	0.206	0.214	
С	0.46	0.58	0.018	0.023	
с1	0.46	0.58	0.018	0.023	
D	5.97	6.22	0.235	0.245	
Е	6.48	6.73	0.255	0.265	
е	2.28 BSC		0.090	BSC	
L	8.89	9.53	0.350	0.375	
L1	1.91	2.28	0.075	0.090	
L2	0.89	1.27	0.035	0.050	
L3	1.15	1.52	0.045	0.060	
ECN: S-03946—Rev. E, 09-Jul-01 DWG: 5346					

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