

N-Channel 100 V (D-S) MOSFET

V _{DS}		100	V
R _{DS(on),typ}	V _{GS} =10V	115	mΩ
R _{DS(on),typ}	V _{GS} =4.5V	120	mΩ
I _D		15	A

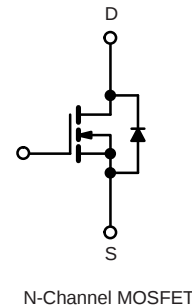
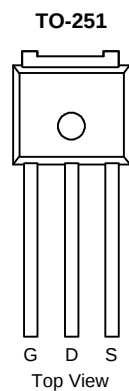
FEATURES

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


RoHS
 COMPLIANT

APPLICATIONS

- Primary Side Switch



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 _D	15	A
	T _C = 125 °C		8.7	
Pulsed Drain Current		I _{DM}	45	
Continuous Source Current (Diode Conduction)		I _S	15	
Avalanche Current		I _{AR}	15	mJ
Repetitive Avalanche Energy (Duty Cycle ≤ 1 %)	L = 0.1 mH	E _{AR}	11.3	
Maximum Power Dissipation	T _C = 25 °C	P _D	61 ^b	W
	T _A = 25 °C		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
Junction-to-Ambient ^a	t ≤ 10 s	R _{thJA}	16	20	°C/W
	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.

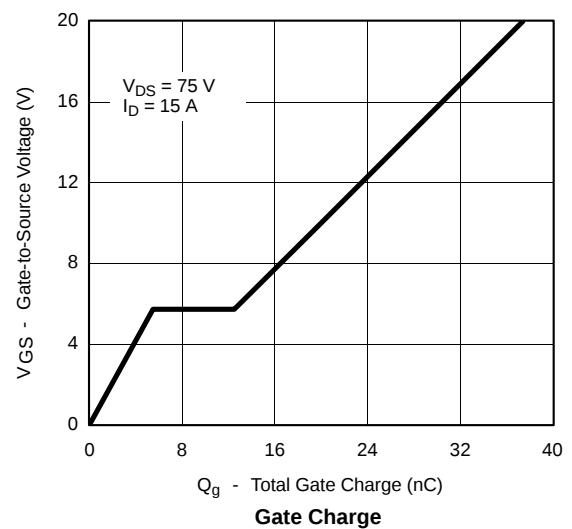
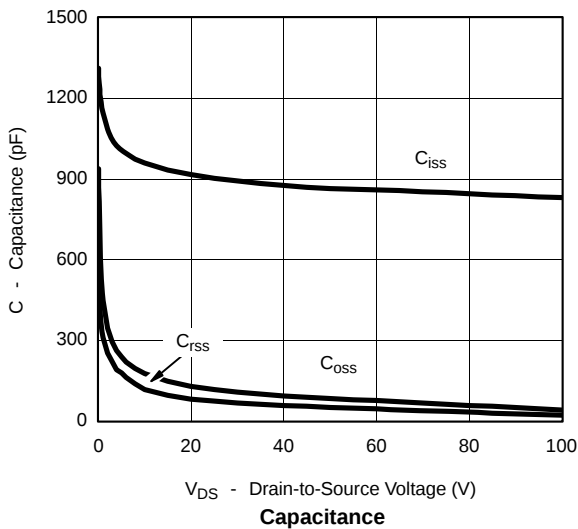
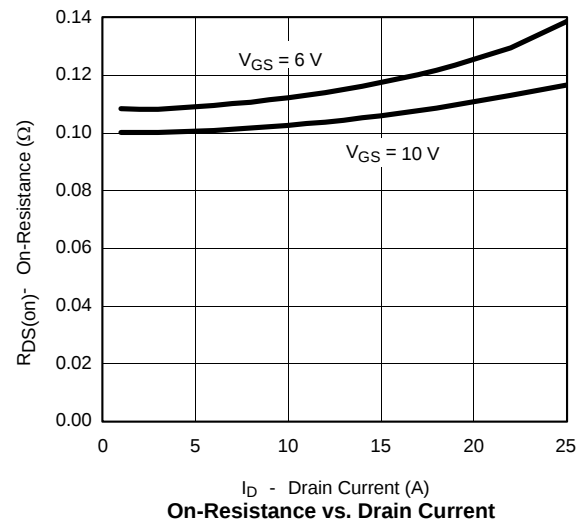
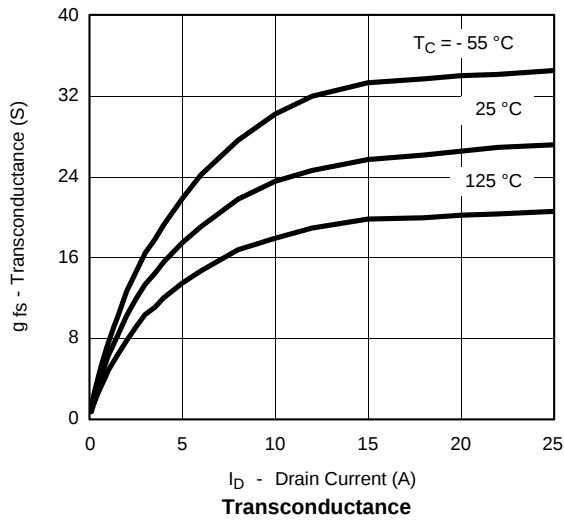
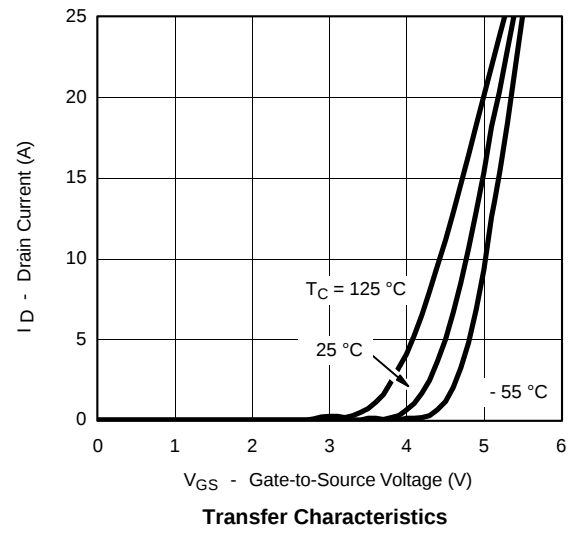
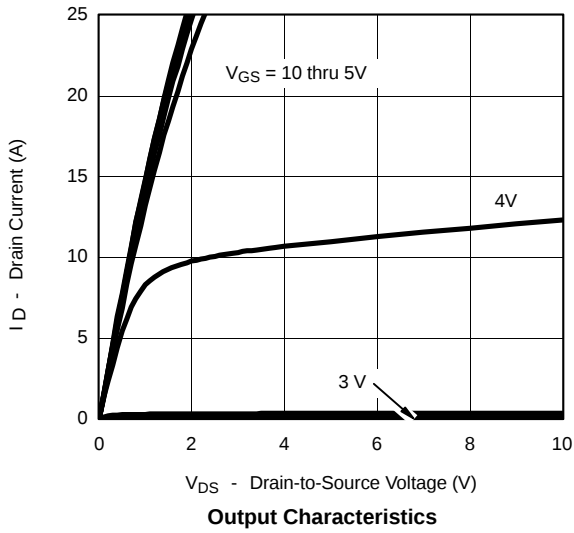
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ. ^a	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	100			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1.0		3.0	
Gate-Body Leakage	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} = 100 V, V _{GS} = 0 V, T _J = 125 °C			50	
		V _{DS} = 100 V, V _{GS} = 0 V, T _J = 175 °C			250	
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	15			A
Drain-Source On-State Resistance ^b	R _{DS(on)}	V _{GS} = 10 V, I _D = 15 A		115		mΩ
		V _{GS} = 10 V, I _D = 15 A, T _J = 125 °C		170		
		V _{GS} = 10 V, I _D = 15 A, T _J = 175 °C		230		
		V _{GS} = 6 V, I _D = 10 A		120		
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 15 A		25		S
Dynamic ^a						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		1400		pF
Output Capacitance	C _{oss}			110		
Reverse Transfer Capacitance	C _{rss}			70		
Total Gate Charge ^c	Q _g	V _{DS} = 75 V, V _{GS} = 10 V, I _D = 15 A			20	nC
Gate-Source Charge ^c	Q _{gs}				5.5	
Gate-Drain Charge ^c	Q _{gd}				7	
Gate Resistance	R _g		1		3.2	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 75 V, R _L = 5 Ω I _D ≅ 15 A, V _{GEN} = 10 V, R _G = 2.5 Ω		8	12	ns
Rise Time ^c	t _r			35	55	
Turn-Off Delay Time ^c	t _{d(off)}			17	25	
Fall Time ^c	t _f			30	45	
Source-Drain Diode Ratings and Characteristic (T _C = 25 °C)						
Pulsed Current	I _{SM}				45	A
Diode Forward Voltage ^b	V _{SD}	I _F = 15 A, V _{GS} = 0 V		0.9	1.5	V
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 15 A, dI/dt = 100 A/μs		55	85	ns

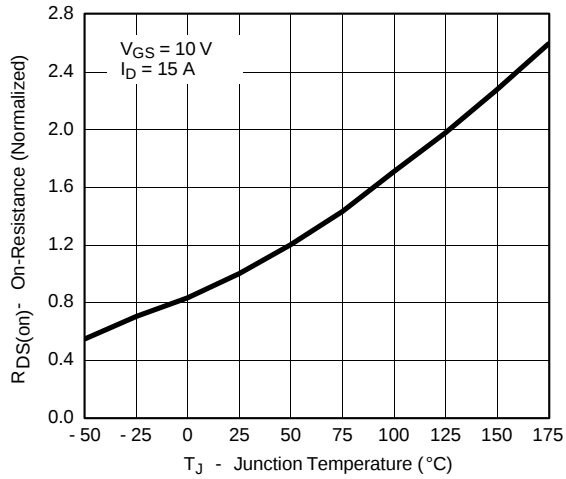
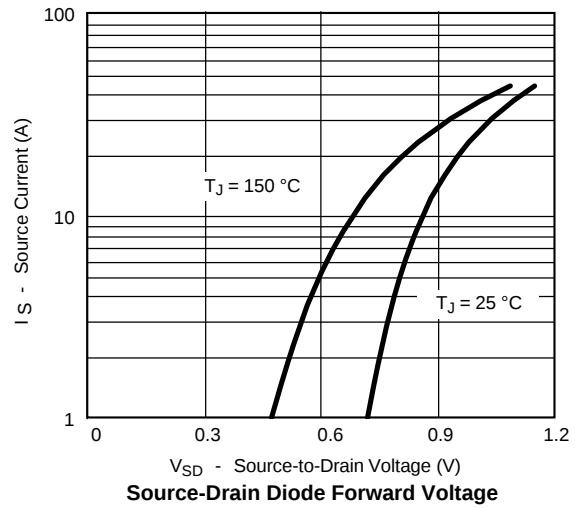
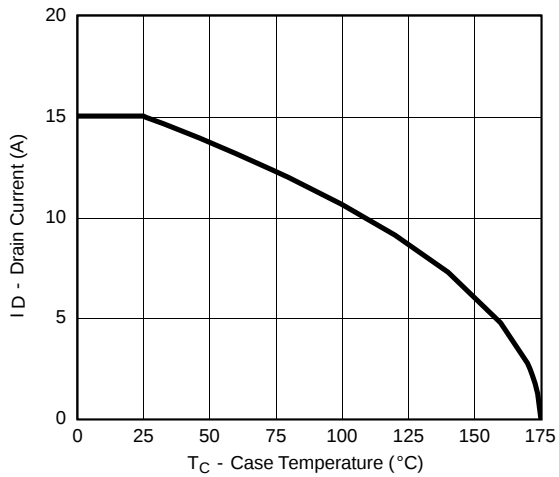
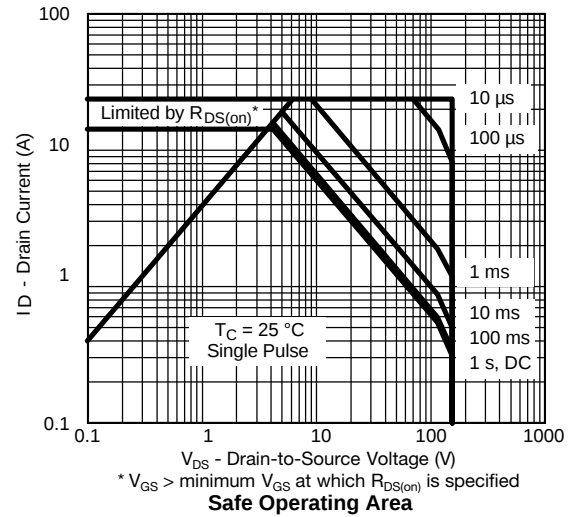
Notes:

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

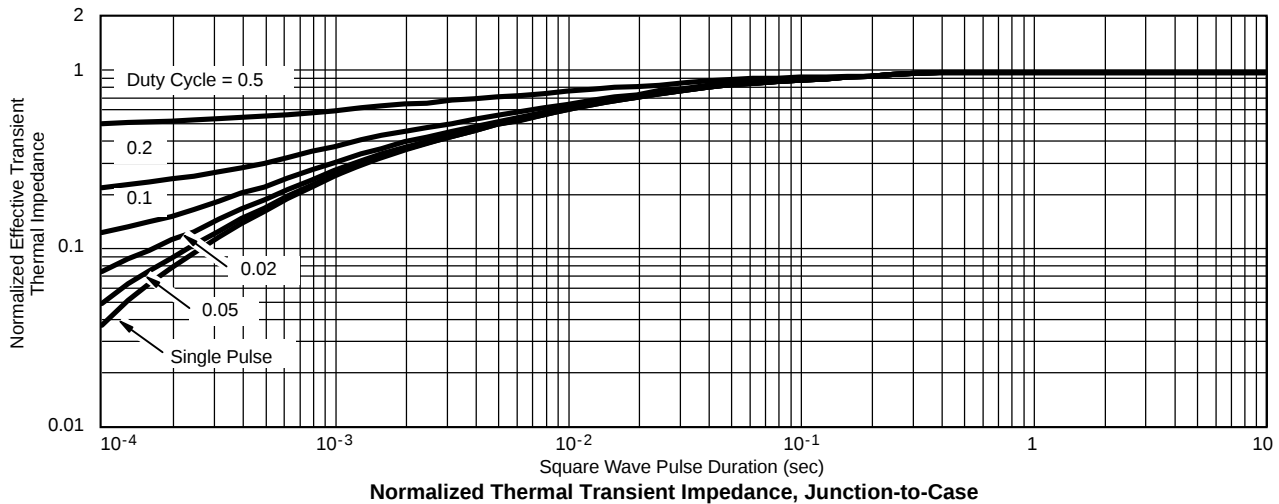
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS (25 °C unless noted)

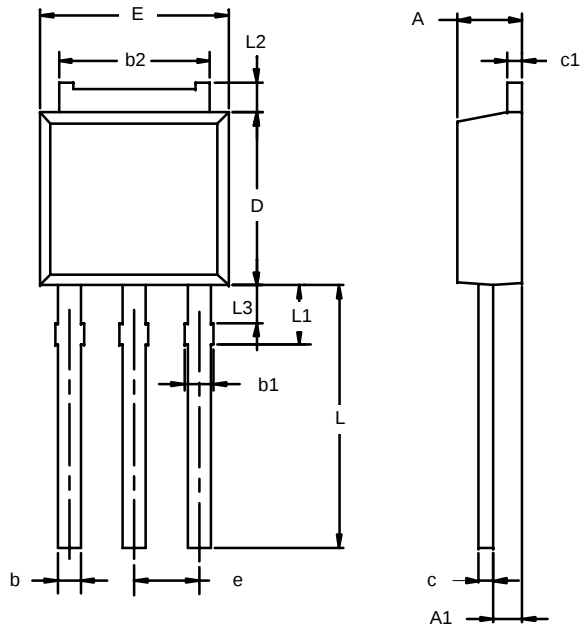


TYPICAL CHARACTERISTICS (25 °C unless noted)

On-Resistance vs. Junction Temperature

Source-Drain Diode Forward Voltage
THERMAL RATINGS

**Maximum Avalanche Drain Current
vs. Case Temperature**


* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area

Normalized Thermal Transient Impedance, Junction-to-Case

TO-251AA (DPAK)



Note: Dimension L3 is for reference only.

Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	2.21	2.38	0.087	0.094
A1	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
c	0.46	0.58	0.018	0.023
c1	0.46	0.58	0.018	0.023
D	5.97	6.22	0.235	0.245
E	6.48	6.73	0.255	0.265
e	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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