

N-Channel 150 V (D-S) MOSFET

PRODUCT SUMMARY		
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)
150	0.100 at V _{GS} = 10 V	20
	0.138 at V _{GS} = 4.5 V	16

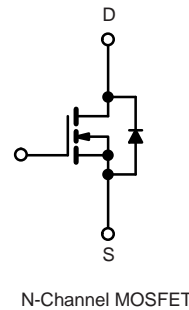
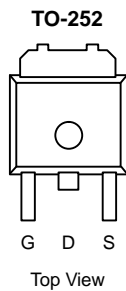
FEATURES

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



APPLICATIONS

- Primary Side Switch
- DC/DC Converters
- DC/AC Inverters
- Motor Drives



ABSOLUTE MAXIMUM RATINGS (T _C = 25 °C, unless otherwise noted)					
Parameter	Symbol	Limit	Unit		
Drain-Source Voltage	V _{DS}	150	V		
Gate-Source Voltage	V _{GS}	± 20			
Continuous Drain Current (T _J = 175 °C) ^b	I _D	T _C = 25 °C	20	A	
		T _C = 125 °C	13		
Pulsed Drain Current	I _{DM}	80			
Continuous Source Current (Diode Conduction)	I _S	20			
Avalanche Current	I _{AS}	29			
Repetitive Avalanche Energy (Duty Cycle ≤ 1 %)	L = 0.1 mH E _{AS}	13.3	mJ		
Maximum Power Dissipation ^a	P _D	T _C = 25 °C	67 ^b	W	
		T _A = 25 °C ^c	3.6		
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 ^c	R _{thJA}	45	65	°C/W
Junction-to-Case	R _{thJC}	2	2.4	

Notes:

- Duty cycle ≤ 1 %.
- See SOA curve for voltage derating.
- When mounted on 1" square PCB (FR-4 material).

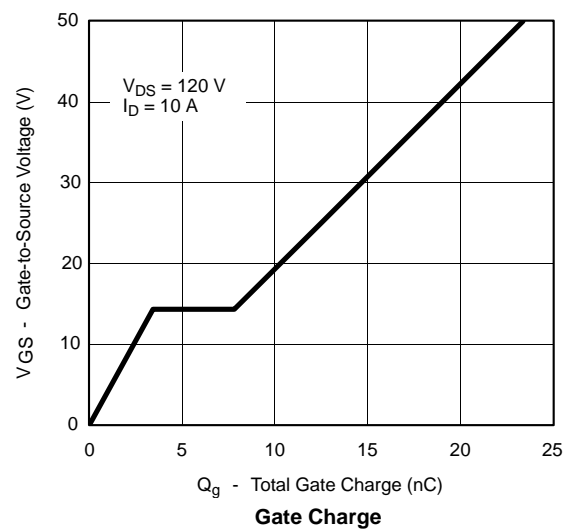
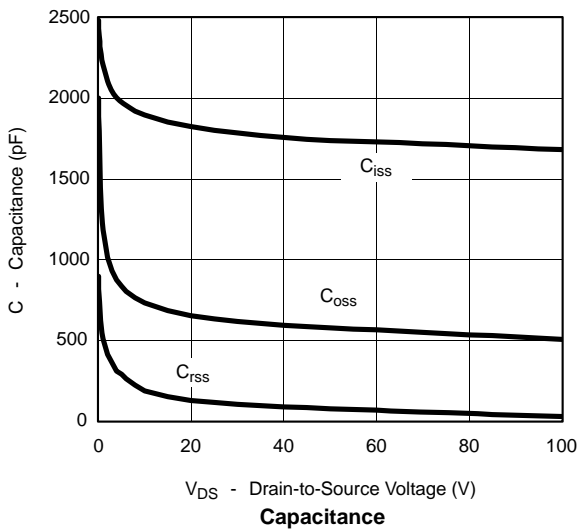
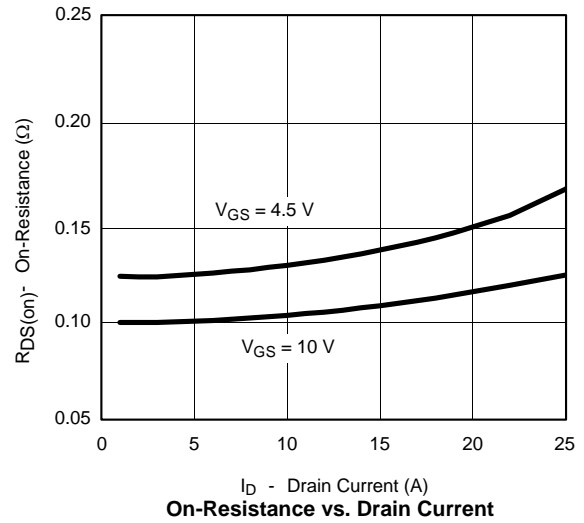
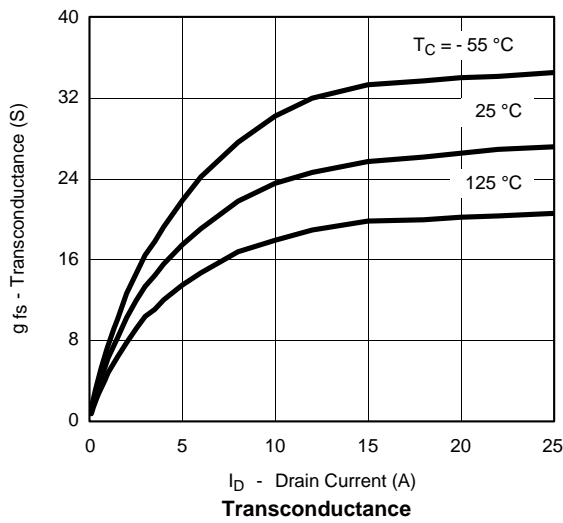
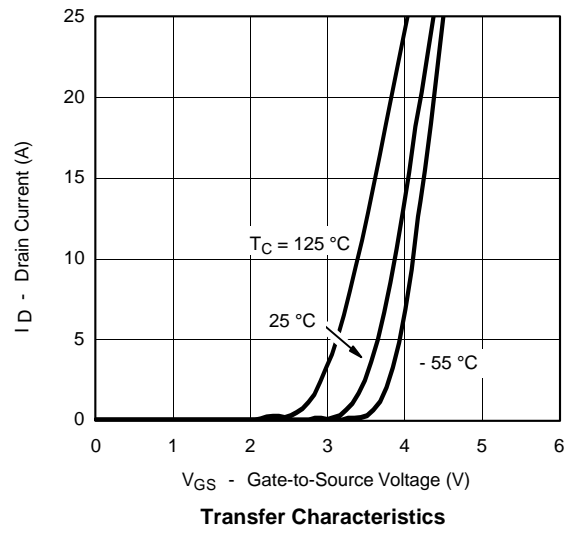
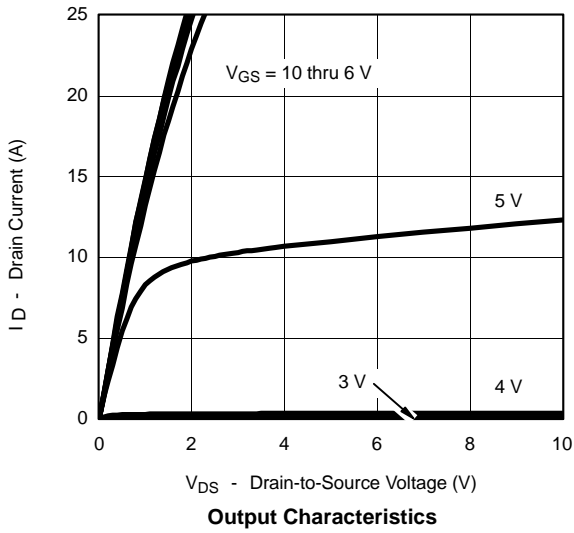
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ. ^a	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	150			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2		4	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 120\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 120\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$			50	
		$V_{DS} = 120\text{ V}, V_{GS} = 0\text{ V}, T_J = 175\text{ }^\circ\text{C}$			250	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	20			A
Drain-Source On-State Resistance ^b	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 10\text{ A}$		0.100	0.122	Ω
		$V_{GS} = 10\text{ V}, I_D = 10\text{ A}, T_J = 125\text{ }^\circ\text{C}$		0.128	0.175	
		$V_{GS} = 10\text{ V}, I_D = 10\text{ A}, T_J = 175\text{ }^\circ\text{C}$		0.159	0.193	
		$V_{GS} = 4.5\text{ V}, I_D = 10\text{ A}$		0.138	0.166	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 10\text{ A}$		25		S
Dynamic^a						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 120\text{ V}, f = 1\text{ MHz}$		1850		μF
Output Capacitance	C_{oss}			615		
Reverse Transfer Capacitance	C_{rss}			70		
Total Gate Charge ^c	Q_g	$V_{DS} = 120\text{ V}, V_{GS} = 10\text{ V}, I_D = 10\text{ A}$		20	25	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	$t_{d(on)}$	$V_{DD} = 120\text{ V}, R_L = 5\text{ }\Omega$ $I_D \cong 10\text{ A}, V_{GEN} = 10\text{ V}, R_G = 2.5\text{ }\Omega$		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 ($T_C = 25\text{ }^\circ\text{C}$)						
Pulsed Current	I_{SM}				80	A
Diode Forward Voltage ^b	V_{SD}	$I_F = 10\text{ A}, V_{GS} = 0\text{ V}$		0.7	1.2	V
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 10\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		55	85	ns

Notes:

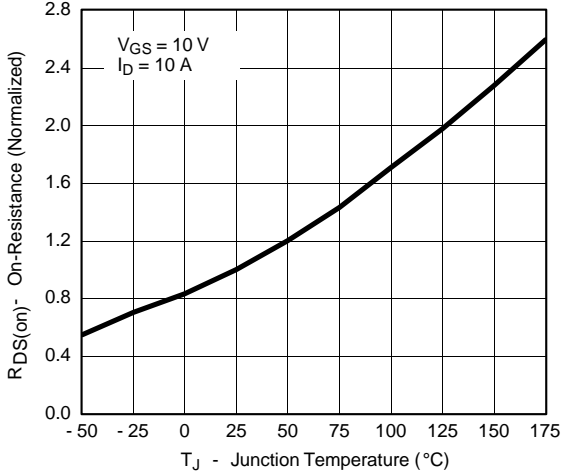
- Guaranteed by design, not subject to production testing.
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Independent of operating temperature.

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.

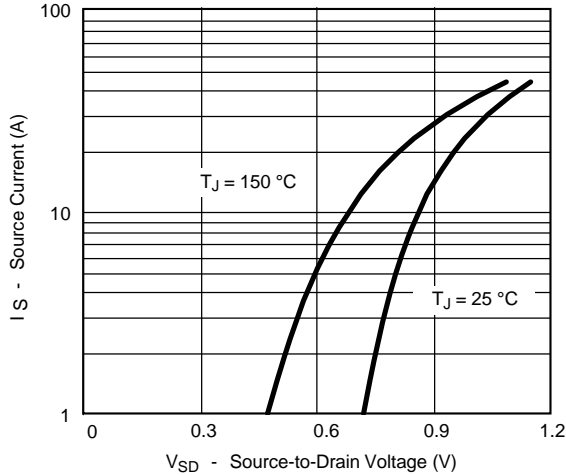
TYPICAL CHARACTERISTICS (25 °C unless noted)



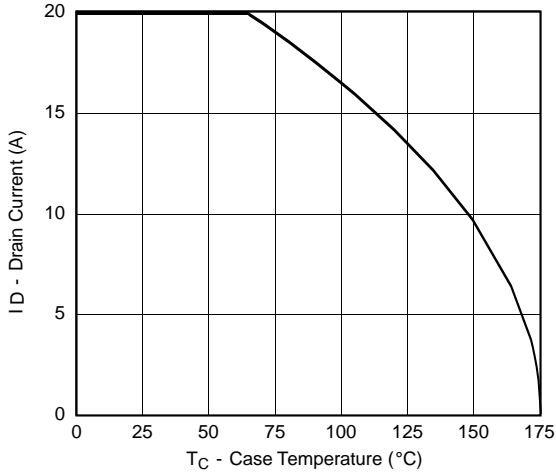
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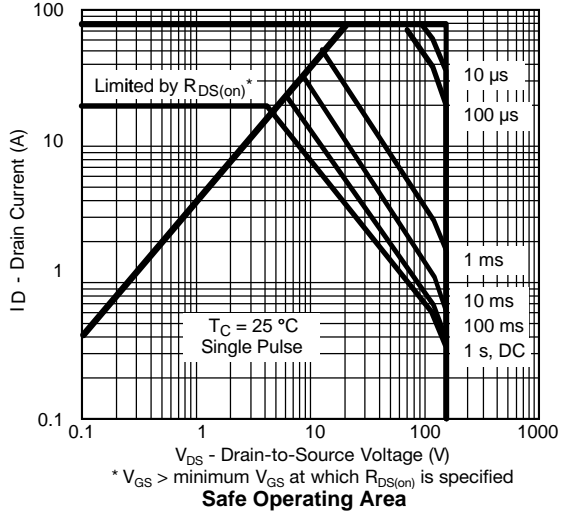
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage



Maximum Avalanche Drain Current vs. Case Temperature



Safe Operating Area

TO-252AA CASE OUTLINE



DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.38	0.086	0.094
A1	-	0.127	-	0.005
b	0.64	0.88	0.025	0.035
b2	0.76	1.14	0.030	0.045
b3	4.95	5.46	0.195	0.215
C	0.46	0.61	0.018	0.024
C2	0.46	0.89	0.018	0.035
D	5.97	6.22	0.235	0.245
D1	5.21	-	0.205	-
E	6.35	6.73	0.250	0.265
E1	4.32	-	0.170	-
H	9.40	10.41	0.370	0.410
e	2.28 BSC		0.090 BSC	
e1	4.56 BSC		0.180 BSC	
L	1.40	1.78	0.055	0.070
L3	0.89	1.27	0.035	0.050
L4	-	1.02	-	0.040
L5	1.14	1.52	0.045	0.060
ECN: X12-0247-Rev. M, 24-Dec-12 DWG: 5347				

Note

- Dimension L3 is for reference only.

RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)



Recommended Minimum Pads
Dimensions in Inches/(mm)

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