

N-Channel 900 V (D-S) MOSFET

PRODUCT SUMMARY

V _{DS} (V)	R _{DS(on)} (Ω) TYP.	I _D (A)	Q _g (Typ.)
900	4.6 at V _{GS} = 10 V	3	15

FEATURES

- DT-Trench Power MOSFET
- 100 % R_g and UIS Tested
- Gate-Source ESD Protected

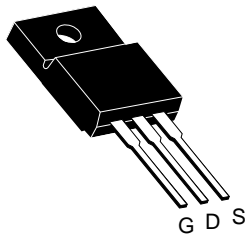


RoHS
COMPLIANT

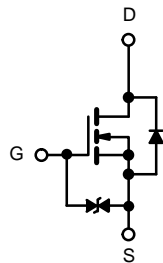
APPLICATIONS

- High efficient switched mode power supplies
- TV Power
- Adapter/charger
- Server Power
- LED Lighting

TO-220 FULLPAK



Top View



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	900	V	
Gate-Source Voltage	V _{GS}	± 30		
Continuous Drain Current	I _D	T _C = 25 °C	3	A
		T _C = 100 °C	1.9	
Pulsed Drain Current (t = 300 μs)	I _{DM}	12		
Avalanche Current	I _{AS}	2.6		
Single Avalanche Energy ^a	E _{AS}	125	mJ	
Maximum Power Dissipation ^a	P _D	T _C = 25 °C	90 ^b	W
		T _A = 25 °C ^c	5.8	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150	°C	

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Limit	Unit
Junction-to-Ambient (PCB Mount) ^c	R _{thJA}	65	°C/W
Junction-to-Case (Drain)	R _{thJC}	5.5	

Notes:

- Duty cycle ≤ 1 %.
- See SOA curve for voltage derating.
- When mounted on 1" square PCB (FR-4 material).
- Base on T_C = 25 °C.

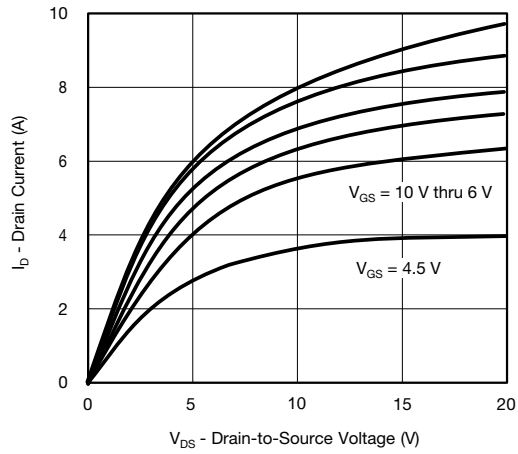
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	900			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2		4	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 30\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 900\text{ V}, V_{GS} = 0\text{ V}$			25	μA
		$V_{DS} = 900\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$			100	
		$V_{DS} = 900\text{ V}, V_{GS} = 0\text{ V}, T_J = 150\text{ }^\circ\text{C}$			250	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 10\text{ V}, V_{GS} = 10\text{ V}$	3			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 2\text{ A}, T_J = 25\text{ }^\circ\text{C}$		4.6	5.5	Ω
		$V_{GS} = 10\text{ V}, I_D = 2\text{ A}, T_J = 150\text{ }^\circ\text{C}$		8.8		
Forward Transconductance ^a	g_{fs}	$V_{DS} = 20\text{ V}, I_D = 2\text{ A}$		9		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		561		μF
Output Capacitance	C_{oss}			47		
Reverse Transfer Capacitance	C_{rss}			3.8		
Total Gate Charge ^c	Q_g	$V_{DS} = 720\text{ V}, V_{GS} = 10\text{ V}, I_D = 2\text{ A}$		15		nC
Gate-Source Charge ^c	Q_{gs}			2.6		
Gate-Drain Charge ^c	Q_{gd}			7.1		
Gate Resistance	R_g	$f = 1\text{ MHz}$		1		Ω
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 720\text{ V}, R_L = 9.6\text{ }\Omega$ $I_D \cong 2\text{ A}, V_{GEN} = 10\text{ V}, R_g = 10\text{ }\Omega$		8		ns
Rise Time ^c	t_r			12		
Turn-Off Delay Time ^c	$t_{d(off)}$			48		
Fall Time ^c	t_f			15		
Drain-Source Body Diode Ratings and Characteristics^b $T_C = 25\text{ }^\circ\text{C}$						
Continuous Current	I_S				3	A
Pulsed Current	I_{SM}				12	
Forward Voltage ^a	V_{SD}	$I_F = 2\text{ A}, V_{GS} = 0\text{ V}$		0.9		V
Reverse Recovery Time	t_{rr}	$I_F = 1.5\text{ A}, di/dt = 50\text{ A}/\mu\text{s}$		626		ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			6		A
Reverse Recovery Charge	Q_{rr}			3		μC

Notes:

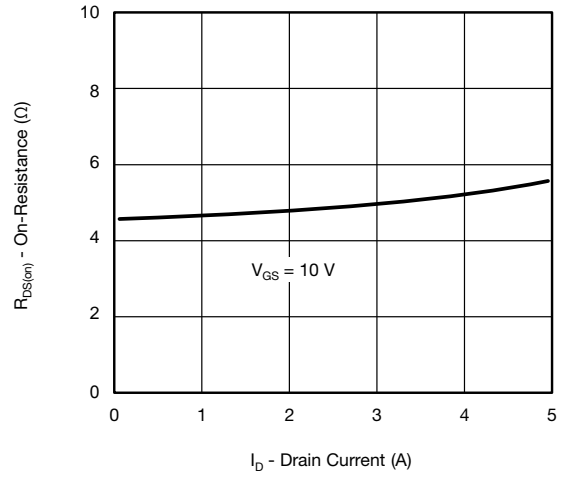
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

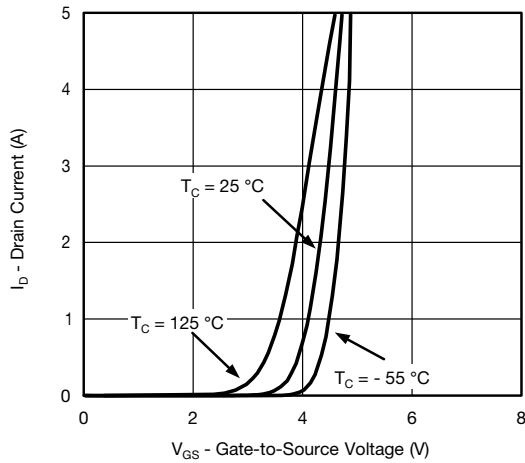
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



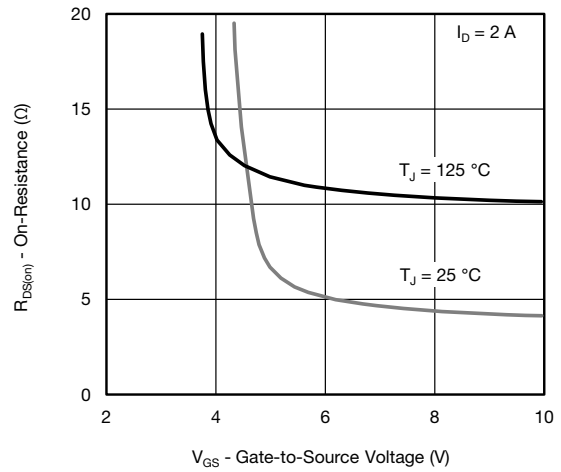
Output Characteristics



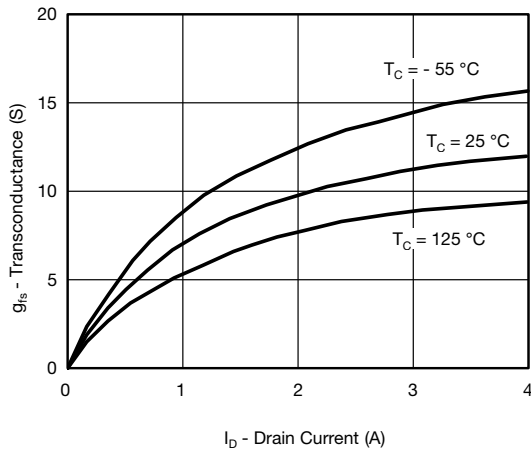
On-Resistance vs. Drain Current



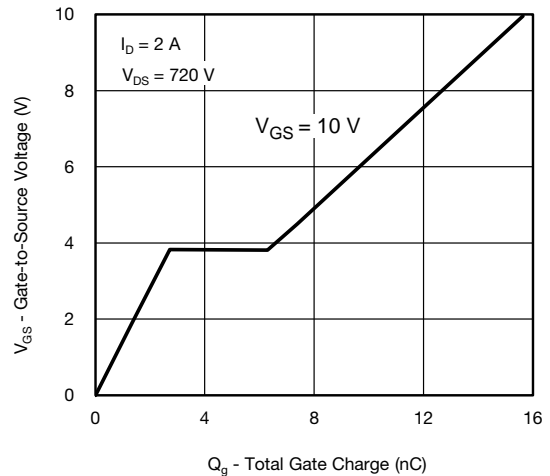
Transfer Characteristics



On-Resistance vs. Gate-to-Source Voltage

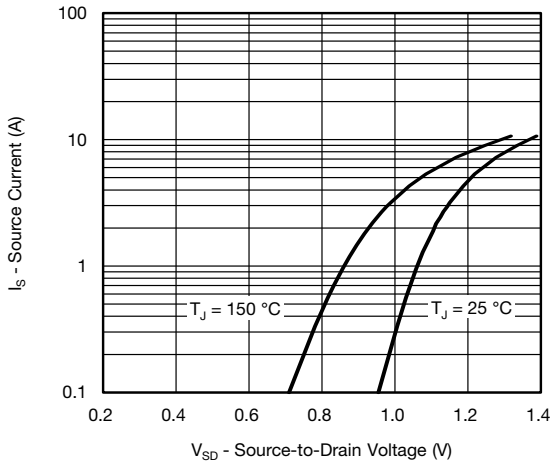


Transconductance

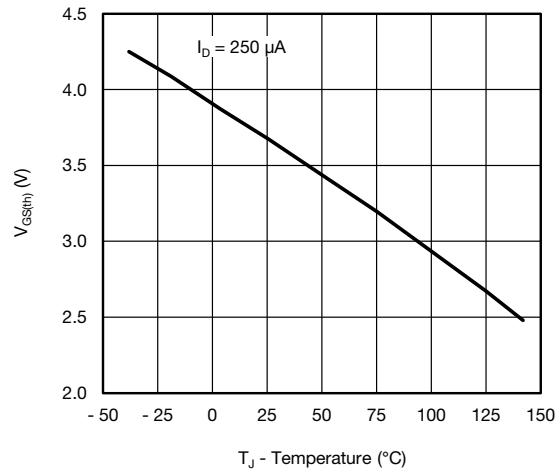


Gate Charge

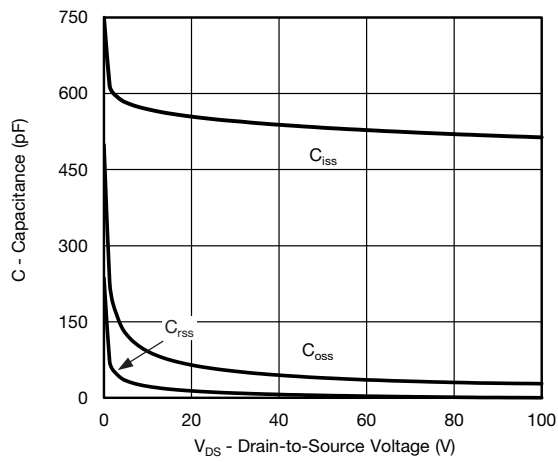
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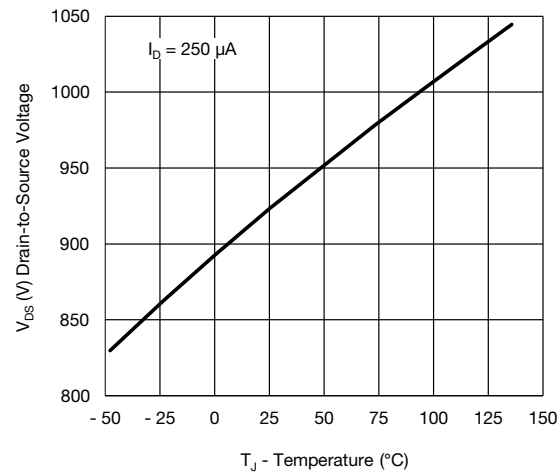
Source-Drain Diode Forward Voltage



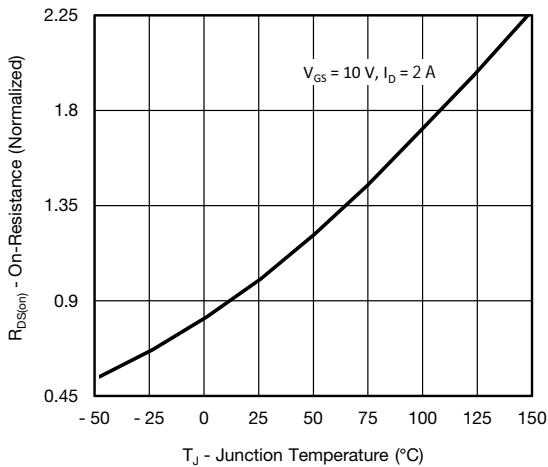
Threshold Voltage



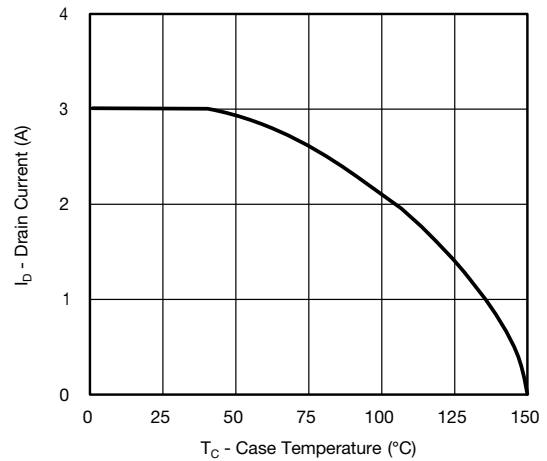
Capacitance



Drain Source Breakdown vs. Junction Temperature

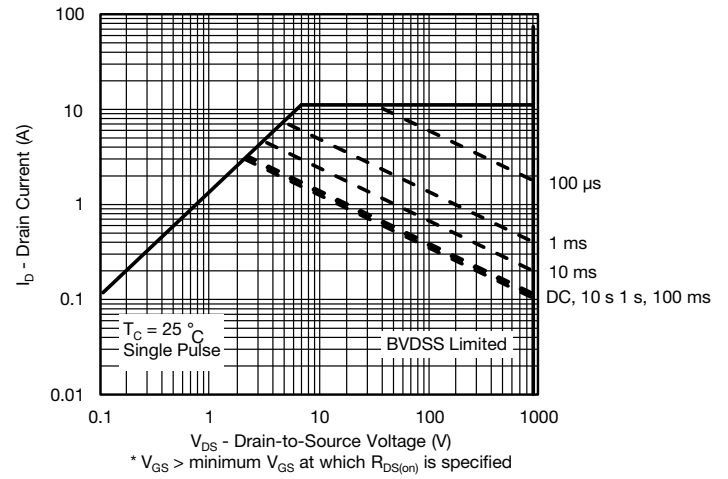
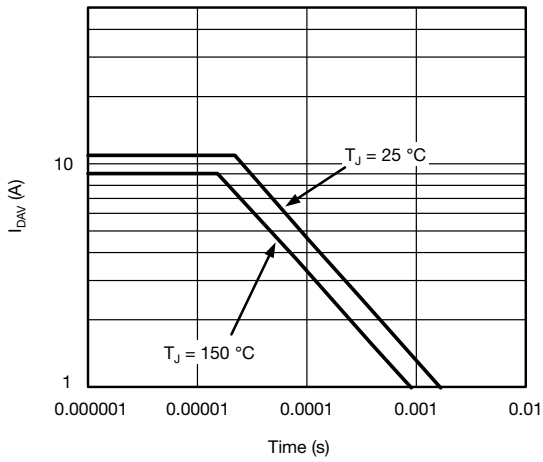


On-Resistance vs. Junction Temperature



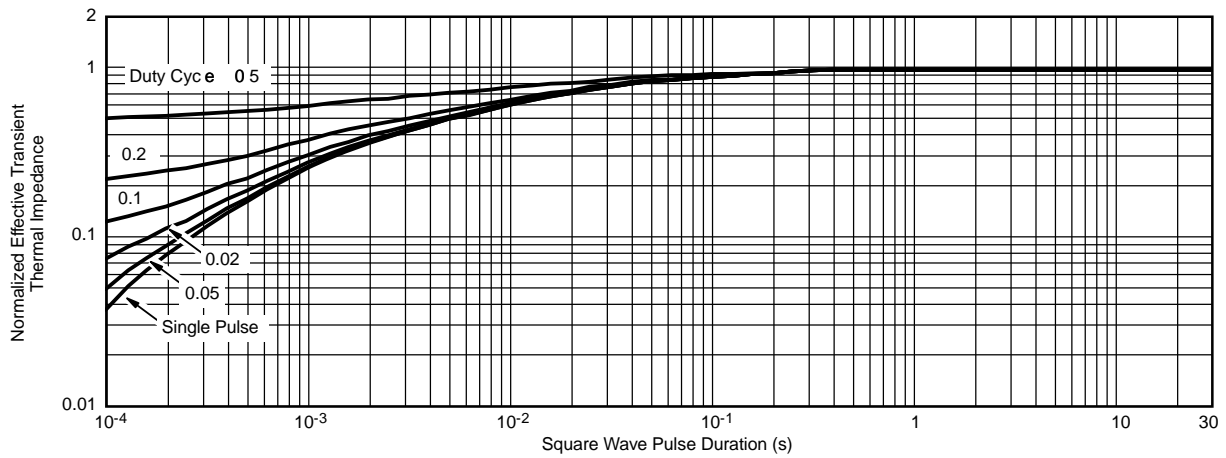
Current Derating

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



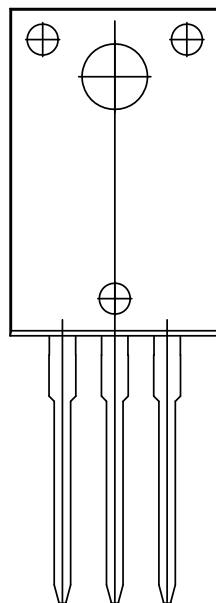
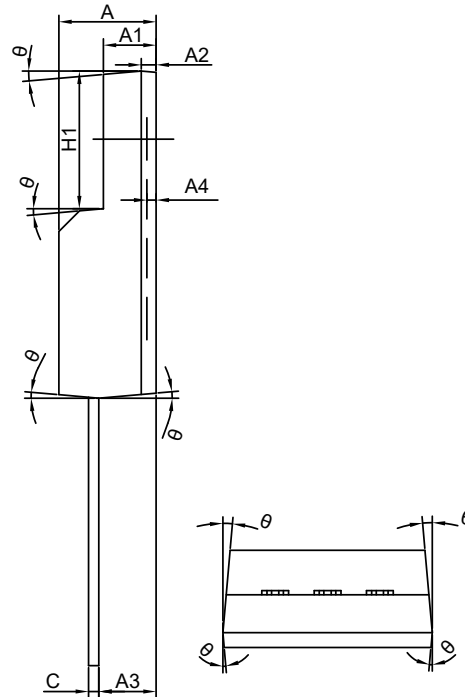
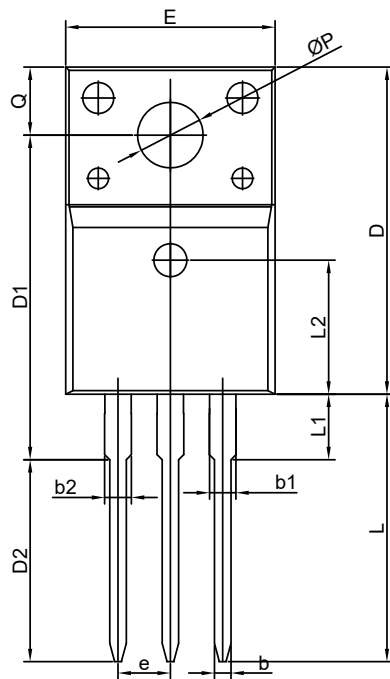
Single Pulse Avalanche Current Capability vs. Time

Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

TO-220F-3L PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	4.30	4.72	5.10
A1	2.25	2.56	2.90
A2	0.72 REF		
A3	2.28	2.78	3.50
A4	0.45 MAX		
b	0.65	-	0.95
b1	1.00	-	1.55
b2	-	-	1.55
c	0.40	0.50	0.65
D	15.47	15.87	16.37
D1	15.35	15.75	16.25
E	9.76	10.16	10.76
e	2.54 BSC		
H1	6.28	6.68	7.08
L	12.48	12.98	13.50
L1	2.90	-	3.80
L2	2.54 BSC		
ØP	2.98	3.18	3.50
Q	3.00	-	3.60
θ	3°	5°	7°

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