

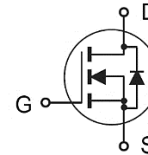
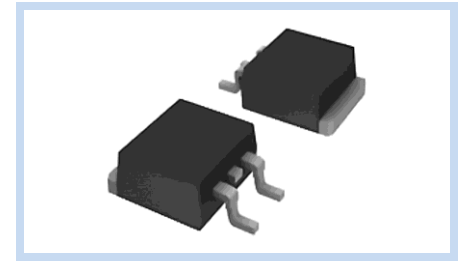
N-Channel MOSFET 900V 4A 25W TO-252

MFT90N4A0T252

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FEATURE

- $R_{DS(ON)} < 3.5\Omega$ at $V_{GS}=10V$, $I_D=2A$
- Super High Dense Cell Design for Low $R_{DS(ON)}$
- Applications: UPS, PFC



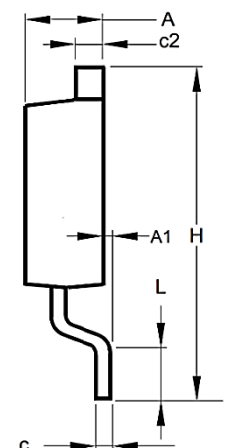
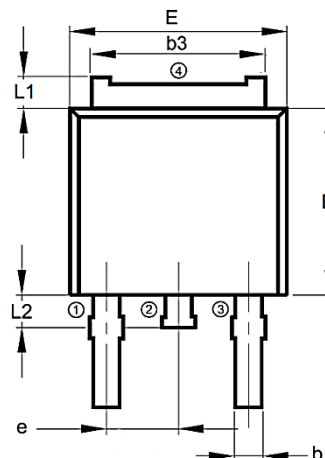
MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	900	V
Gate-Source Voltage	V_{GS}	± 30	V
Drain Current – Continuous	I_D	$V_{GS}=10V, T_C=25^\circ C$	A
		$V_{GS}=10V, T_C=100^\circ C$	
Drain Current – Pulsed	I_{DM}	16	A
Power Dissipation	P_D	25	W
Single Pulse Avalanche Energy	E_{AS}	125	mJ
Thermal Resistance Junction to Case	$R_{\theta JC}$	5	$^\circ C/W$
Operating Junction and Storage Temperature	T_J, T_{STG}	-55 to +150	$^\circ C$

DIMENSIONS

Item	Min (mm)	Max (mm)
A	2.10	2.50
A1	--	0.10
b	0.66	0.86
b3	5.18	5.48
c	0.40	0.60
c2	0.44	0.58
D	5.90	6.30
E	6.40	6.80
e	2.29 BSC	
H	9.50	10.70
L	1.35	1.65
L1	1.09	1.21

Note: 1: Gate, 2,4: Drain, 3: Source



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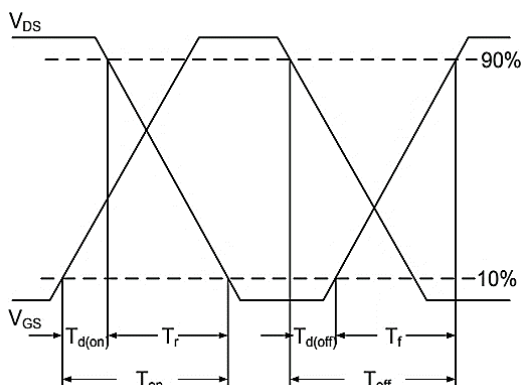
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	900	--	--	V
Zero Gate Voltage Drain Current	$V_{DS}=900V, V_{GS}=0V$	I_{DSS}	--	--	1	μA
Gate-Body Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0V$	I_{GSS}	--	--	± 100	nA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=2A$	$R_{DS(ON)}$	--	3.0	3.5	Ω
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	2.0	3.0	4.5	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=450V, V_{GS}=10V, I_D=4A$	Q_g	--	27	--	nC
Gate-Source Charge		Q_{gs}	--	3.5	--	
Gate-Drain Charge		Q_{gd}	--	14	--	
Turn-On Delay Time	$V_{DS}=720V, R_{GS}=25\Omega, I_D=4A$	$T_{d(on)}$	--	37	--	nS
Rise Time		T_r	--	15	--	
Turn-Off Delay Time		$T_{d(off)}$	--	144	--	
Fall Time		T_f	--	36	--	
Input Capacitance	$V_{DS}=25V, V_{GS}=0V, F=1MHz$	C_{iss}	--	674	--	pF
Output Capacitance		C_{oss}	--	71	--	
Reverse Transfer Capacitance		C_{rss}	--	13	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Current	--	I_S	--	--	4	A
Diode Forward Voltage	$V_{GS}=0V, I_S=2A$	V_{SD}	--	--	1.4	V
Reverse Recovery Time	$V_{GS}=0V, I_S=4A, di/dt=100A/\mu s$	T_{rr}	--	1018	--	nS
Reverse Recovery Charge		Q_{rr}	--	2.2	--	μC

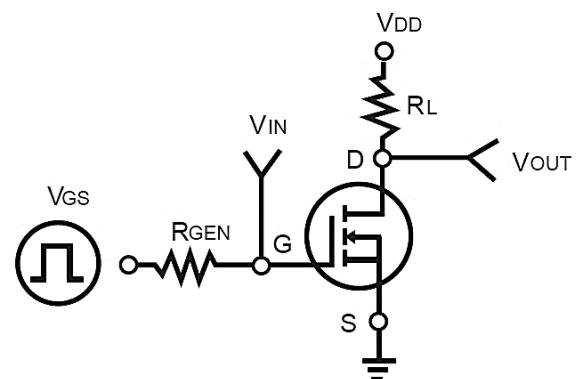
Note:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 1\%$.
3. The EAS data shows maximum rating. EAS condition: $V_{DD}=50V, R_G=25\Omega, L=10mH, I_{AS}=6A$, Starting $T_J=25^\circ C$.
4. The power dissipation P_D is limited by $150^\circ C$ junction temperature.
5. Guaranteed by design, not subject to production.

Switching Time Waveform



Switching Test Circuit



N-Channel MOSFET

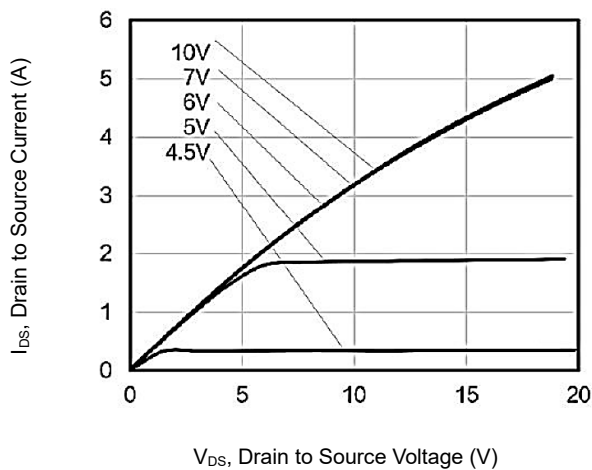
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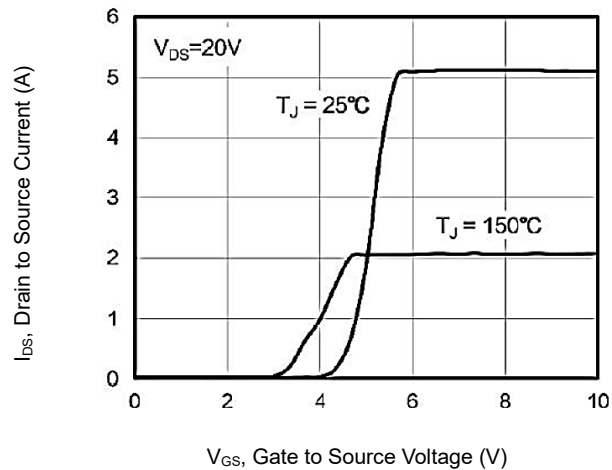
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CHARACTERISTIC CURVES

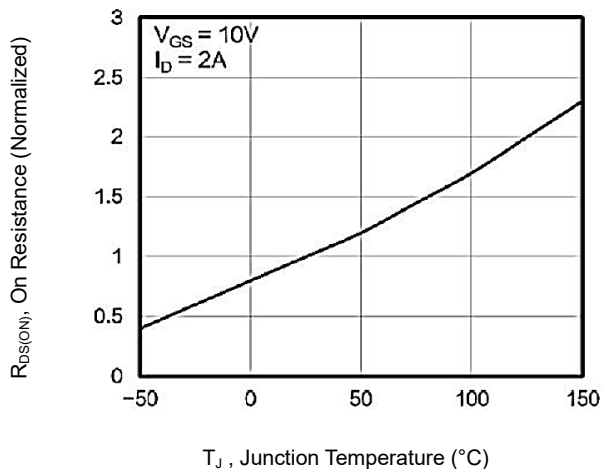
Output Characteristics



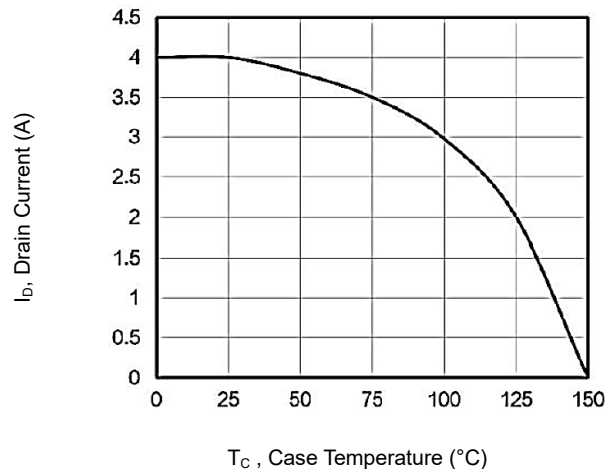
Transfer Characteristics



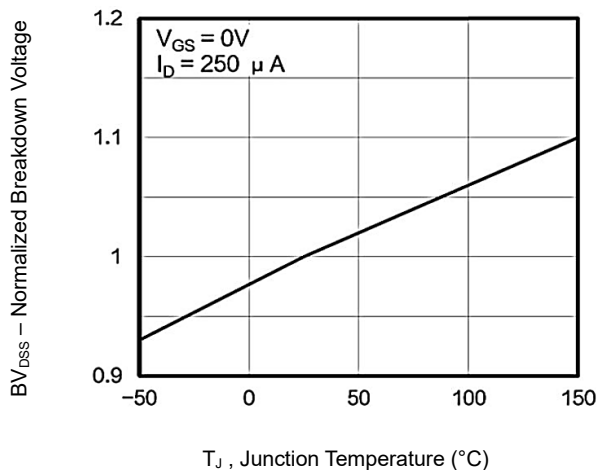
On-Resistance vs. Temperature



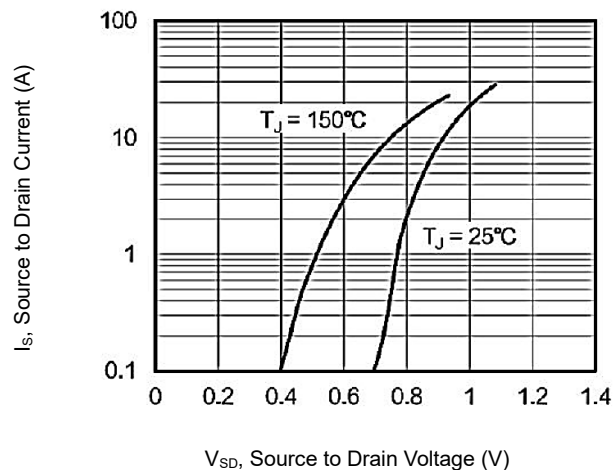
Drain Current vs. Temperature



Breakdown Voltage vs. Temperature



Body Diode Characteristics



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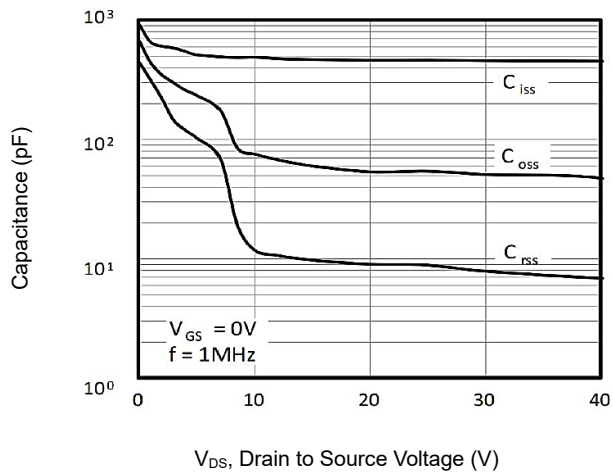
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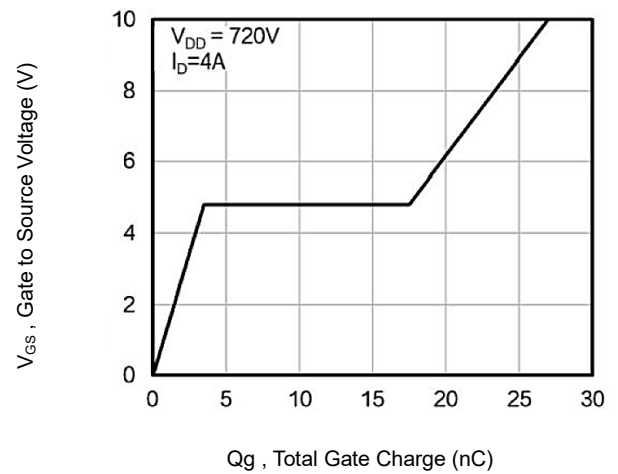
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CHARACTERISTIC CURVES

Capacitance



Gate Charge Characteristics



Transient Thermal Response Curves

