

2N Channel MOSFET

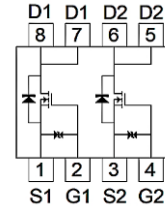
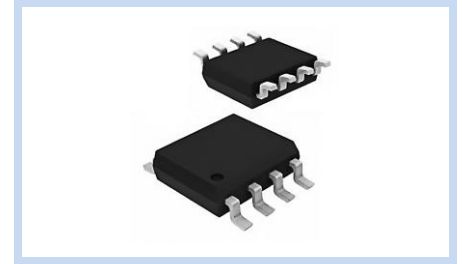
30V 7A 2W SOP-8 ESD

MFT32N7A0S8E

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FEATURE

- $R_{DS(ON)} < 21m\Omega$, $V_{GS}=10V$, $I_D=7A$
- $R_{DS(ON)} < 28m\Omega$, $V_{GS}=4.5V$, $I_D=7A$
- $R_{DS(ON)} < 34m\Omega$, $V_{GS}=4V$, $I_D=7A$
- ESD Protected
- Fast Switching Characteristic
- Low On-Resistance



MECHANICAL DATA

- Case: SOP-8 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current – Continuous	I_D	$T_A= 25^{\circ}C$, $V_{GS}=10V$	7
		$T_A= 70^{\circ}C$, $V_{GS}=10V$	5.6
Drain Current – Pulsed	I_{DM}	40	A
Power Dissipation	P_D	Dual Operation	2.0
		Single Operation (Note3)	1.6
		Single Operation (Note4)	0.9
Single Pulse Avalanche Current	I_{AS}	7	A
Single Pulse Avalanche Energy	E_{AS}	24.5	mJ
Thermal Resistance, Junction to Case	$R_{\theta JC}$	40	$^{\circ}C/W$
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	Dual Operation	62.5
		Single Operation (Note3)	78
		Single Operation (Note4)	135
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^{\circ}C$

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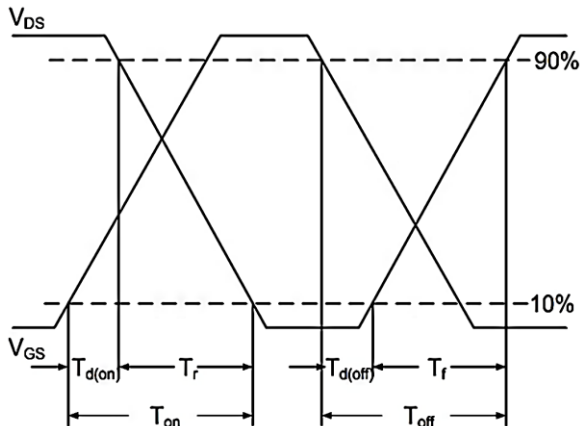
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	30	--	--	V
Drain-Source Leakage Current	$V_{DS}=24V, V_{GS}=0V$	I_{DSS}	--	--	1	μA
Gate-Source Leakage Current	$V_{GS}=\pm 16V, V_{DS}=0V$	I_{GSS}	--	--	± 10	μA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=7A$	$R_{DS(ON)}$	--	16	21	m Ω
	$V_{GS}=4.5V, I_D=7A$		--	22	28	
	$V_{GS}=4.0V, I_D=7A$		--	24	34	
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	1.0	--	2.5	V
Forward Transfer Admittance	$V_{DS}=5V, I_D=6A$	G_{FS}	--	8	--	S
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=15V, V_{GS}=5V, I_D=8A$	Q_g	--	5.9	--	nC
	$V_{DS}=15V, V_{GS}=10V, I_D=8A$		--	11.6	--	
Gate-Source Charge	$V_{DS}=15V, V_{GS}=10V, I_D=8A$	Q_{gs}	--	1.8	--	nC
Gate-Drain Charge		Q_{gd}	--	2.7	--	
Turn-On Delay Time	$V_{DS}=15V, V_{GS}=10V, R_G=3\Omega, I_D=8.3A$	$T_{d(on)}$	--	5.2	--	ns
Rise Time		T_r	--	19.2	--	
Turn-Off Delay Time		$T_{d(off)}$	--	34	--	
Fall Time		T_f	--	7.8	--	
Input Capacitance	$V_{DS}=15V, V_{GS}=0V, F=1MHz$	C_{iss}	--	467	--	pF
Output Capacitance		C_{oss}	--	73	--	
Reverse Transfer Capacitance		C_{rss}	--	59	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Body Diode Forward Current	--	I_S	--	--	2.3	A
Pulse Body Diode Forward Current	--	I_{SM}	--	--	9.2	A
Body Diode Forward Voltage	$V_{GS}=0V, I_S=1A$	V_{SD}	--	0.76	1.0	V
Reverse Recovery Time	$I_F=8A, dI_F/dt=100A/\mu s$	t_{rr}	--	7.5	--	ns
Reverse Recovery Charge		Q_{rr}	--	3.3	--	nC

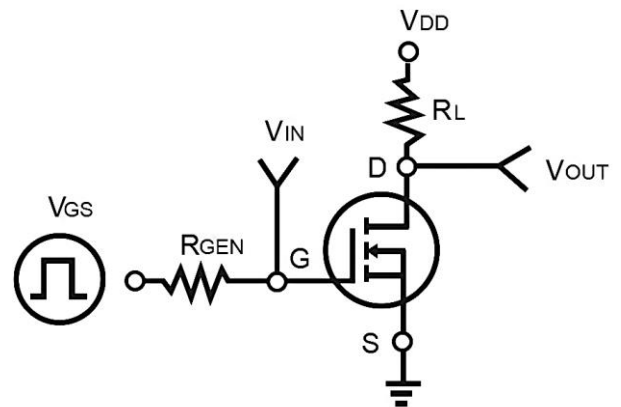
Notes:

1. Pulse width $\leq 300\mu s$, duty cycles $\leq 2\%$
2. $T_A = 25^\circ C$, unless otherwise specified.
3. Surface mounted on 1 inch² pad of 2 oz copper, $t \leq 10s$.
4. Surface mounted on minimum copper pad, pulse width $\leq 10s$.
5. Pulse width limited by maximum junction temperature.

Switching Time Waveform

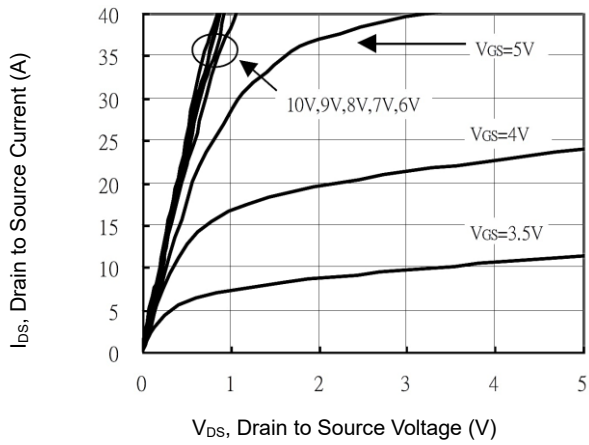


Switching Test Circuit

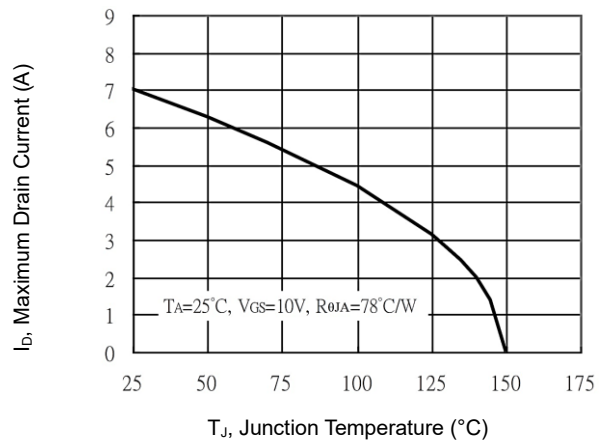


CHARACTERISTIC CURVES

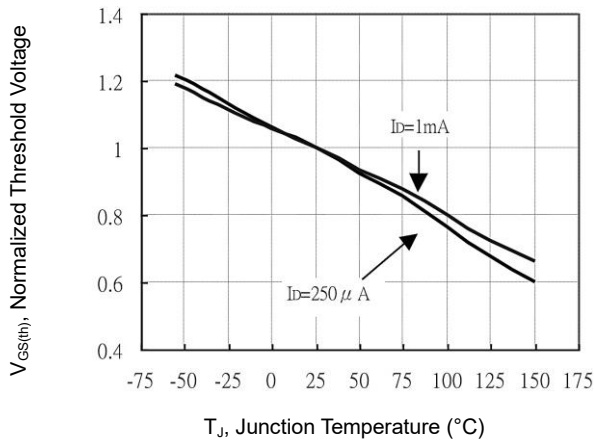
On-Region Characteristics



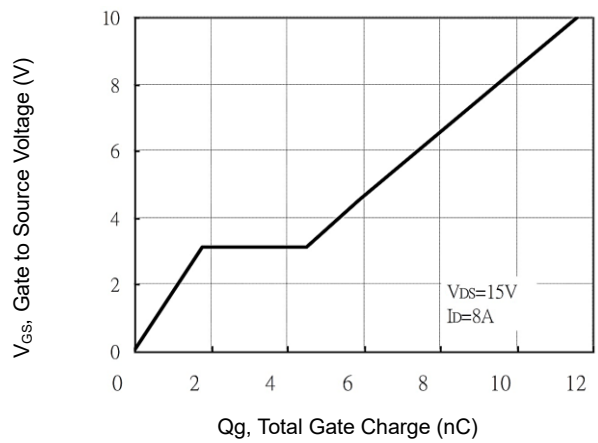
Maximum Drain Current vs. Junction Temperature



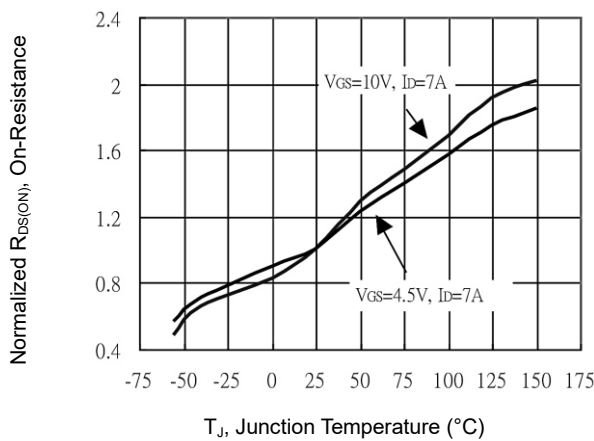
Threshold Voltage vs. Junction Temperature



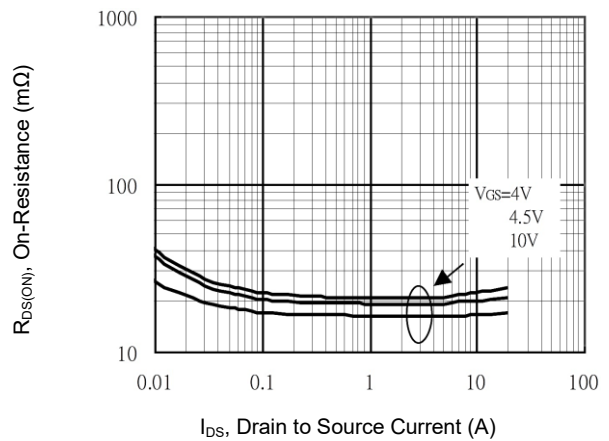
Gate Charge Waveform



Normalized $R_{DS(ON)}$ vs. Junction Temperature



On-Resistance vs. Drain Current



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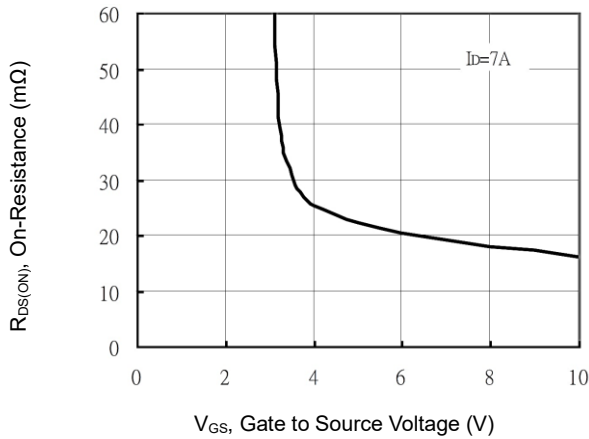
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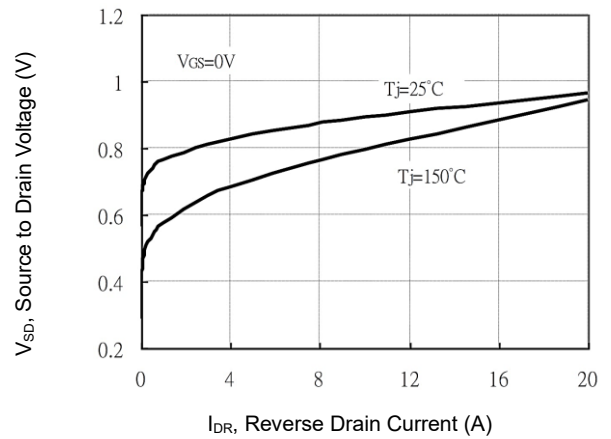
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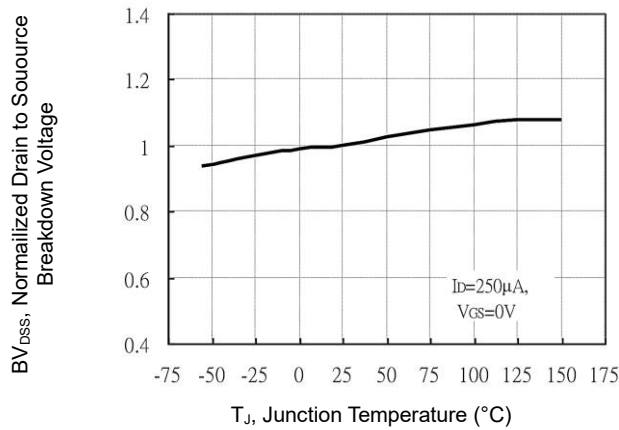
On-Resistance vs V_{GS}



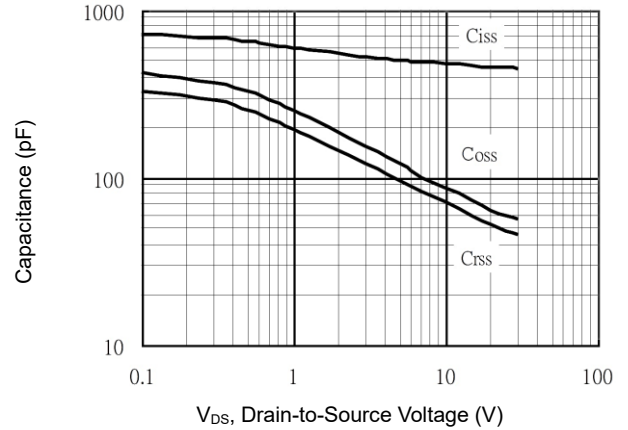
Source to Drain Voltage vs. Reverse Drain Current



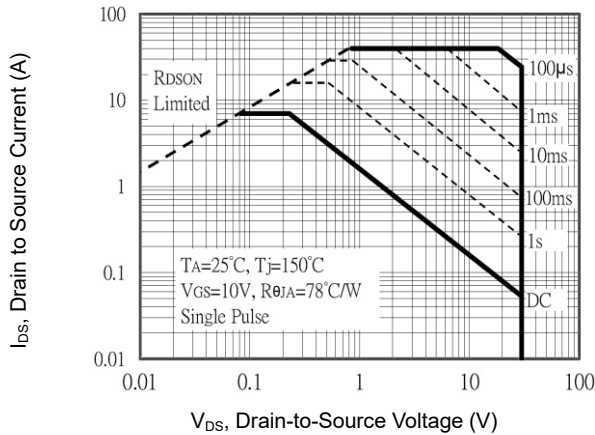
Breakdown Voltage vs. Junction Temperature



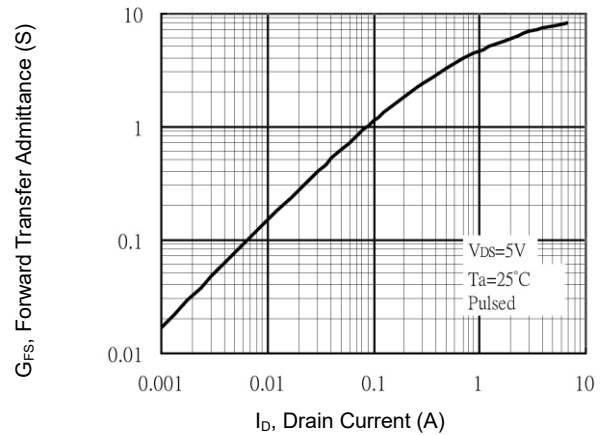
Capacitance vs. Drain-Source Voltage



Maximum Safe Operating Area

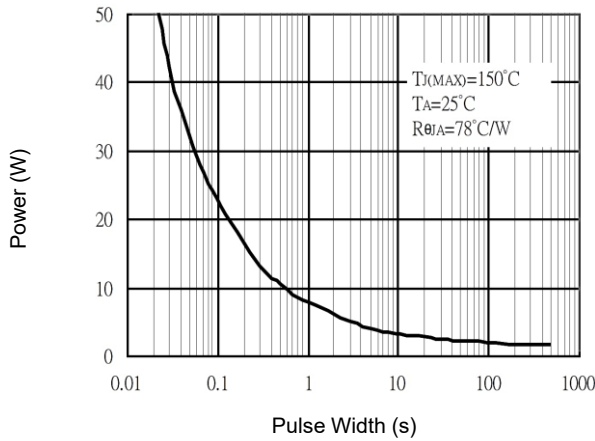


Forward Transfer Admittance vs. Drain Current

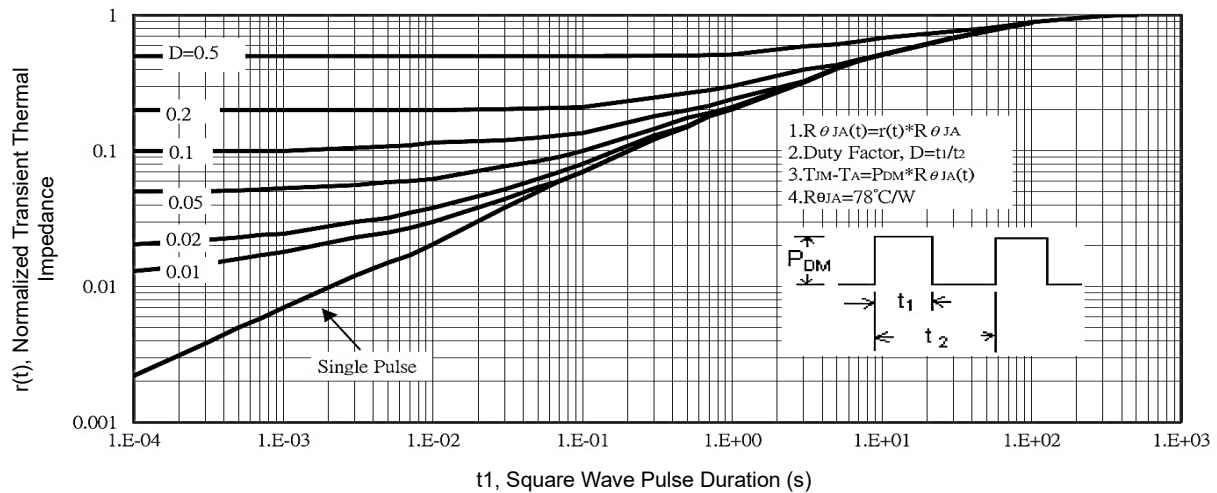


CHARACTERISTIC CURVES

Single Pulse Power Rating



Normalized Transient Thermal Impedance Curve



DIMENSIONS AND RECOMMENDED LAND PATTERN

SOP-8	Min (mm)	Max (mm)
A1	0.10	0.25
A2	1.35	1.55
A3	1.35	1.75
b	0.33	0.51
c	0.17	0.25
D	4.70	5.10
E	5.80	6.20
E1	3.80	4.00
e		1.27
e1		2.54
L	0.40	1.27
X		0.60
X1		3.81
Y		1.52
Y1		7.00
C		1.27

