

N-Channel MOSFET

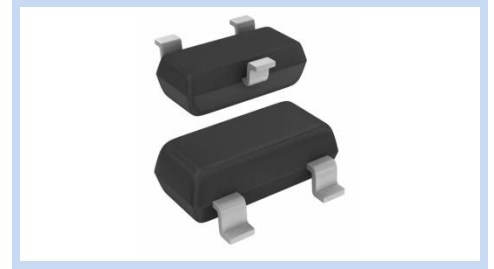
30V 5.2A 1.25W SOT-23

MFT3N5A2S23

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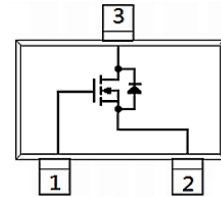
FEATURE

- $R_{DS(ON)} < 29m\Omega$, $V_{GS}=10V$, $I_D=5.2A$
- $R_{DS(ON)} < 45m\Omega$, $V_{GS}=4.5V$, $I_D=5.2A$
- High Dense Cell Design for Extremely Low $R_{DS(ON)}$
- Lead Free Product is Acquired
- Rugged and Reliable



MECHANICAL DATA

- Case: SOT-23 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

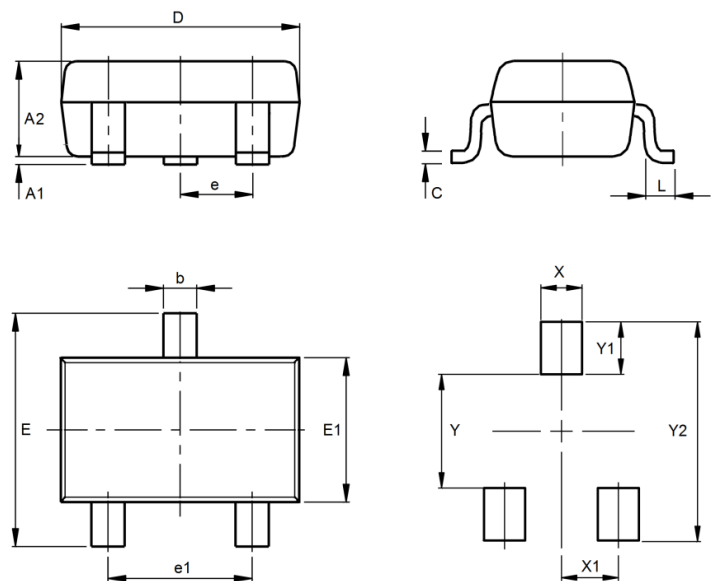


MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current – Continuous	I_D	5.2	A
Drain Current – Pulsed	I_{DM}	20.8	A
Power Dissipation	P_D	1.25	W
Operating Junction Temperature Range	T_J, T_{stg}	-55 to 150	$^{\circ}C$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	100	$^{\circ}C/W$

DIMENSIONS

Item	Min (mm)	Max (mm)
A1	0.00	0.10
A2	0.90	1.10
b	0.35	0.50
C	0.08	0.20
D	2.80	3.04
e	0.90	1.00
e1	1.80	2.00
E	2.20	2.60
E1	1.20	1.40
L		0.15
X		0.80
X1		0.95
Y		1.10
Y1		0.90
Y2		2.90



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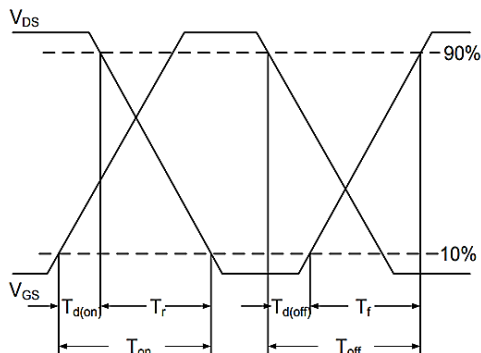
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=10\mu A$	BV_{DSS}	30	-	-	V
Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V$	I_{DSS}	-	-	1	μA
Gate Leakage Current, Forward	$V_{DS}=0V, V_{GS}=20V$	I_{GSSF}	-	-	100	nA
Gate Leakage Current, Reverse	$V_{DS}=0V, V_{GS}=20V$	I_{GSSR}	-	-	-100	nA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	1	-	3	V
Drain-Source On-Resistance	$V_{GS}=10V, I_D=5A$	$R_{DS(ON)}$	-	22	29	m Ω
	$V_{GS}=4.5V, I_D=4A$		-	33	45	m Ω
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=10V, V_{GS}=4.5V, I_D=5A$	Q_g	-	5	6.5	nC
Gate-Source Charge		Q_{gs}	-	1	-	nC
Gate-Drain Charge		Q_{gd}	-	1	-	nC
Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1.0MHz$	C_{iss}	-	560	-	pF
Output Capacitance		C_{oss}	-	130	-	pF
Reverse Transfer Capacitance		C_{rss}	-	95	-	pF
Turn-On Delay Time	$V_{DD}=15V, V_{GS}=10V, I_D=5A, R_G=3\Omega$	$T_{d(on)}$	-	11	22	ns
Rise Time		T_r	-	5	10	ns
Turn-Off Delay Time		$T_{d(off)}$	-	26	52	ns
Fall Time		T_f	-	4	8	ns
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Current	--	I_S	-	-	1	A
Diode Forward Voltage	$I_S=1A, V_{GS}=0V$	V_{SD}	-	-	1.1	V

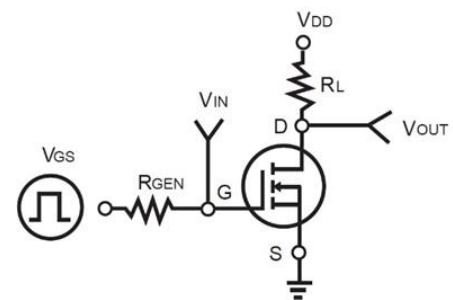
Note:

1. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
2. Essentially independent of operating temperature.
3. Repetitive Rating: Pulse width limited by maximum junction temperature
4. Guarantee by design, not test in mass production

Switching Time Waveform



Switching Test Circuit



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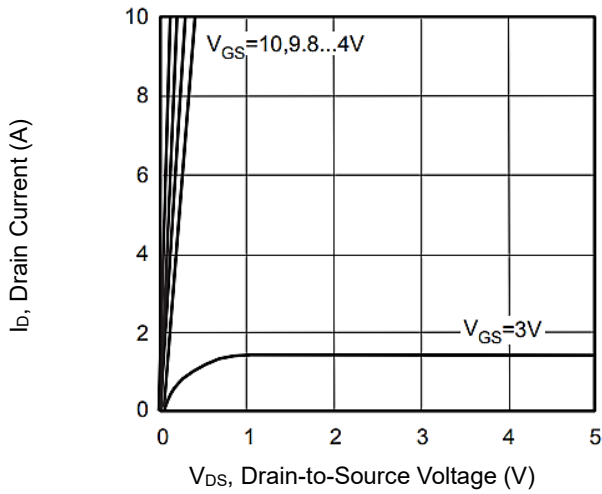
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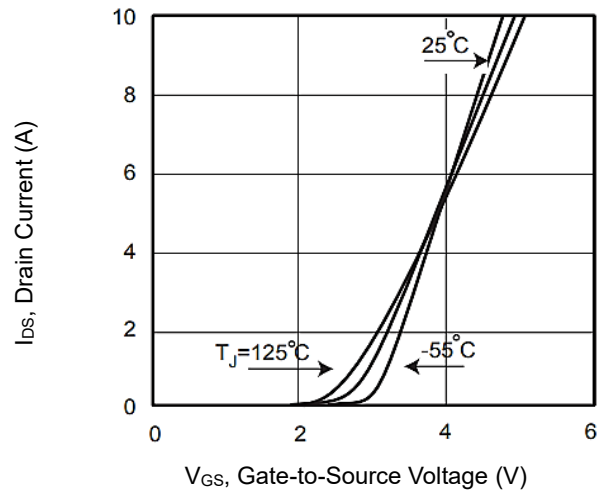
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CHARACTERISTIC CURVES

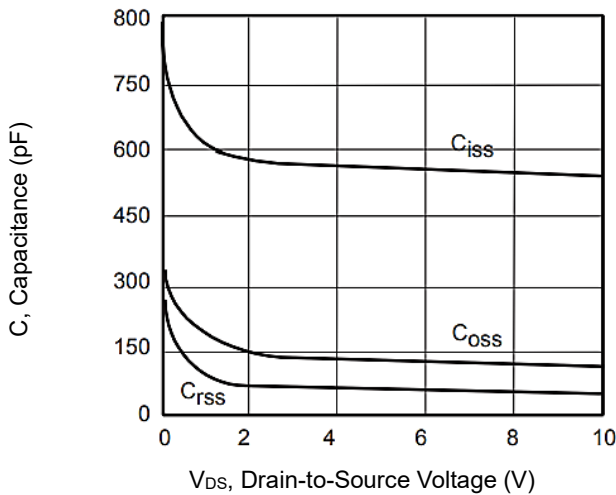
Output Characteristics



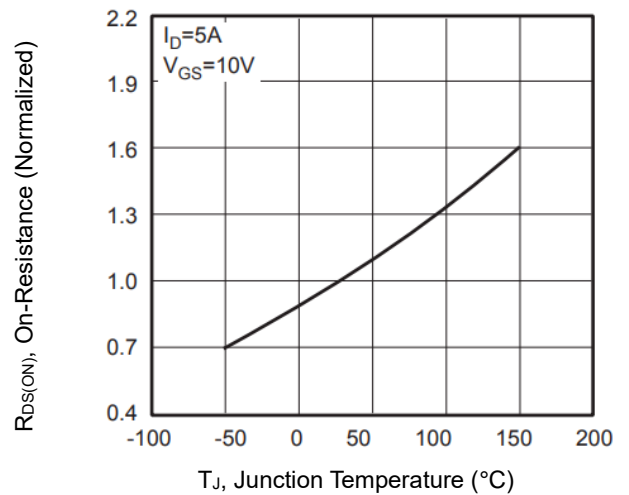
Transfer Characteristics



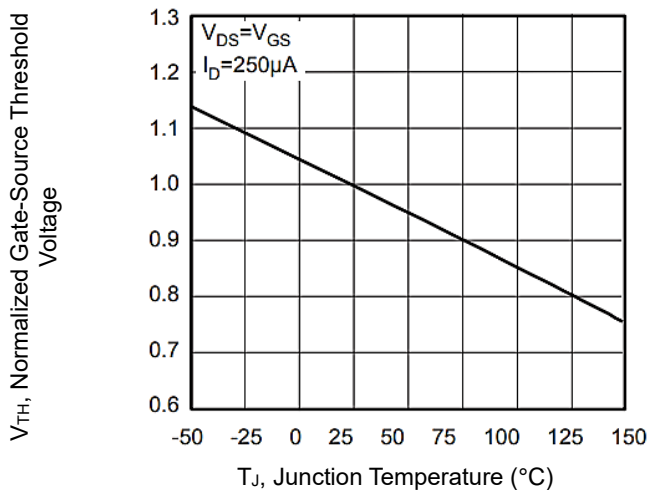
Capacitance



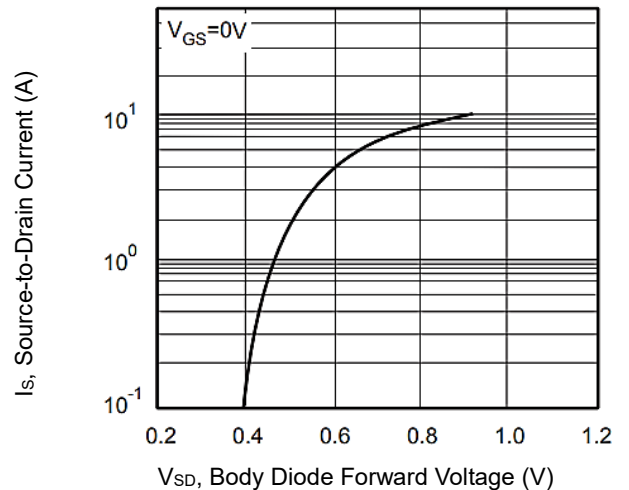
On-Resistance Variation with Temperature



Gate Threshold Variation with Temperature



Body Diode Characteristics



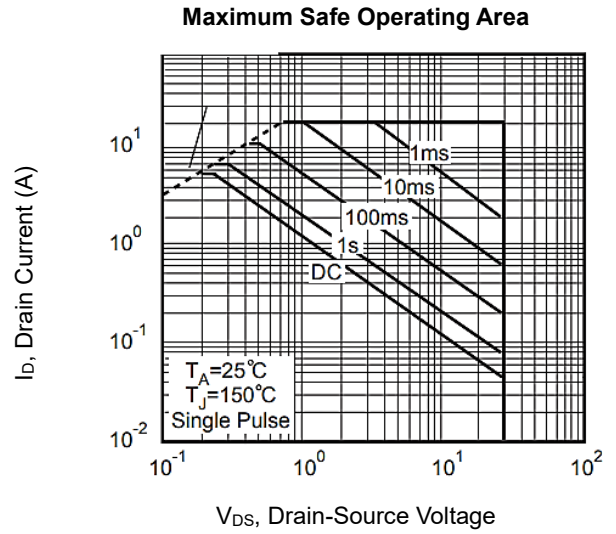
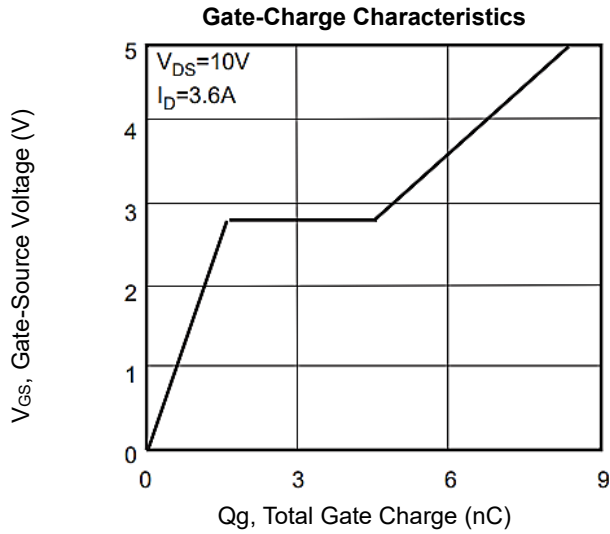
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CHARACTERISTIC CURVES



Normalized Thermal Transient Impedance Curve

