

# N-Channel MOSFET

## 30V 4.8A 1.25W SOT-23

MFT3N4A2S23

MERITEK

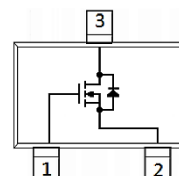
### FEATURE

- $R_{DS(ON)} < 34m\Omega$ ,  $V_{GS}=10V$ ,  $I_D=4.8A$
- $R_{DS(ON)} < 40m\Omega$ ,  $V_{GS}=4.5V$ ,  $I_D=4A$
- $R_{DS(ON)} < 45m\Omega$ ,  $V_{GS}=2.5V$ ,  $I_D=2A$
- $R_{DS(ON)} < 60m\Omega$ ,  $V_{GS}=1.8V$ ,  $I_D=1A$
- Rugged and Reliable
- High Dense Cell Design for Extremely Low  $R_{DS(ON)}$



### MECHANICAL DATA

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

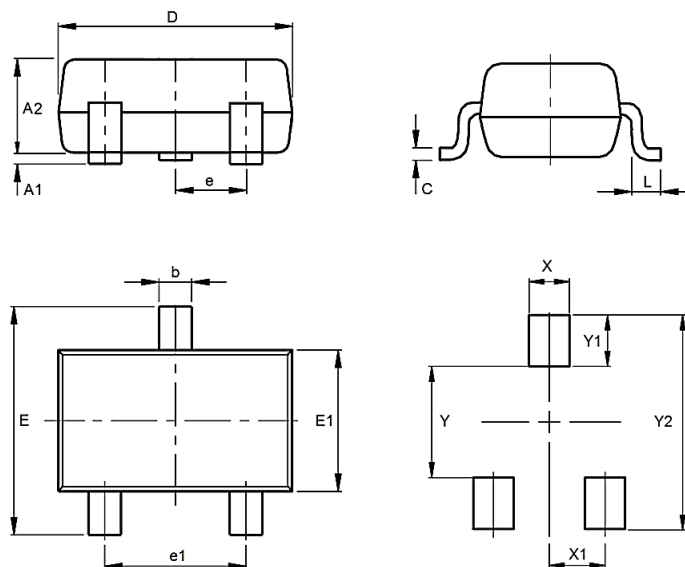


### MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Drain Current – Continuous	$I_D$	4.8	A
Drain Current – Pulsed	$I_{DM}$	20	A
Single-Pulse Avalanche Current	$I_{AS}$	24	A
Single-Pulse Avalanche Energy	$E_{AS}$	28.8	mJ
Power Dissipation	$P_D$	1.25	W
Operating and Storage Junction Temperature	$T_J, T_{stg}$	-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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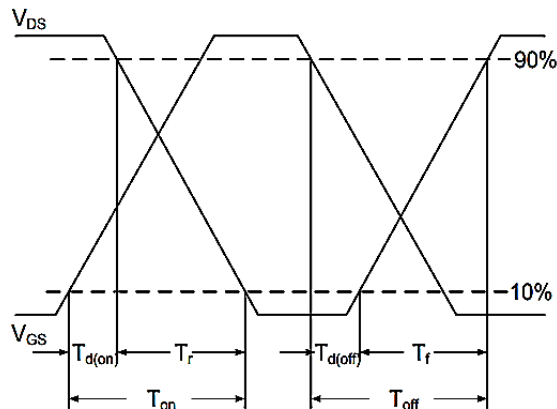
### ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	$BV_{DSS}$	30	--	--	V
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	0.4	--	1	V
Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 12V$	$I_{GSS}$	--	--	$\pm 100$	nA
Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V$	$I_{DSS}$	--	--	1	$\mu A$
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=4.8A$	$R_{DS(on)}$	--	24	34	m $\Omega$
	$V_{GS}=4.5V, I_D=4A$		--	26	40	m $\Omega$
	$V_{GS}=2.5V, I_D=2A$		--	30	45	m $\Omega$
	$V_{GS}=1.8V, I_D=1A$		--	34	60	m $\Omega$
Dynamic Characteristics	Conditions	Symbol	--	Typ.	Max	Unit
Input Capacitance	$V_{DS}=15V, V_{GS}=0V$ $F=1.0MHz$	$C_{iss}$	--	520	--	pF
Output Capacitance		$C_{oss}$	--	85	--	pF
Reverse Transfer Capacitance		$C_{rss}$	--	60	--	pF
Turn-On Delay Time		$T_{d(on)}$	--	9	--	nS
Rise Time	$V_{DS}=15V, I_D=4.8A,$ $V_{GS}=4.5V, R_G=10\Omega$	$T_r$	--	6	--	nS
Turn-Off Delay Time		$T_{d(off)}$	--	44	--	nS
Fall Time		$T_f$	--	10	--	nS
Total Gate Charge	$V_{DS}=15V, V_{GS}=4.5V,$ $I_D=4.8A$	$Q_g$	--	10	--	nC
Gate-Source Charge		$Q_{gs}$	--	1	--	nC
Gate-Drain Charge		$Q_{gd}$	--	3	--	nC
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Voltage	$I_S=1A, V_{GS}=0V$	$V_{SD}$	--	--	1	V
Diode Forward Current	--	$I_S$	--	--	1.2	A

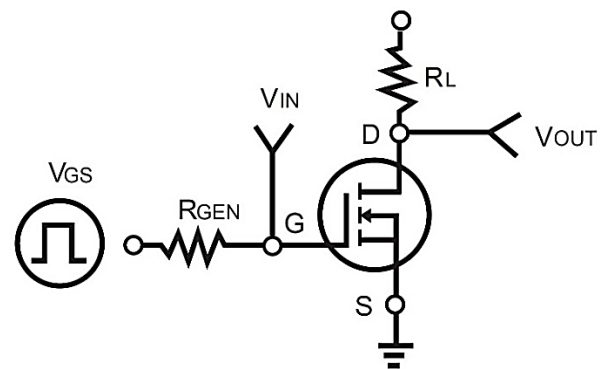
**Notes:**

1. Repetitive rating; pulse width limited by max junction temperature
2. Guaranteed by design, not subject to production testing.
3. Device mounted on an FR4 board,  $t < 5$  sec.
4. Pulse Test : Pulse Width  $< 300\mu s$ , Duty Cycle  $< 2\%$ .
5.  $T_A = 25^\circ C$ , unless otherwise specified.

Switching Time Waveform

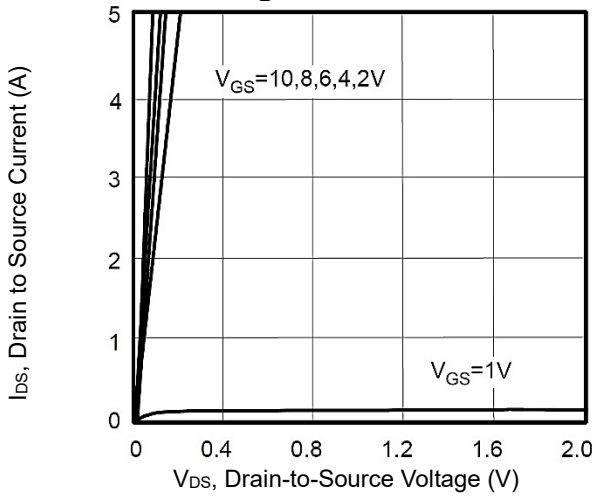


Switching Test Circuit

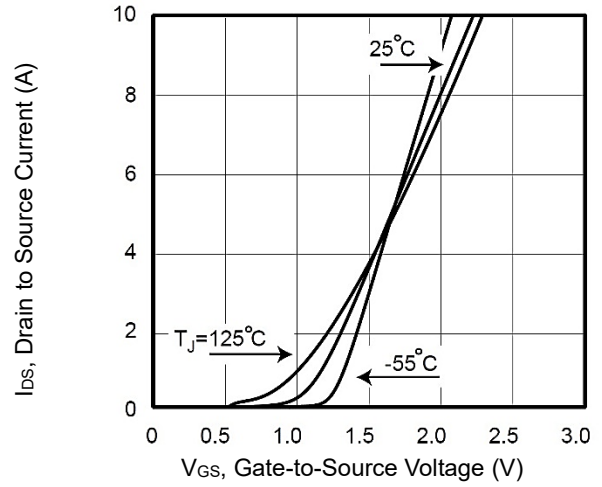


**CHARACTERISTIC CURVES**

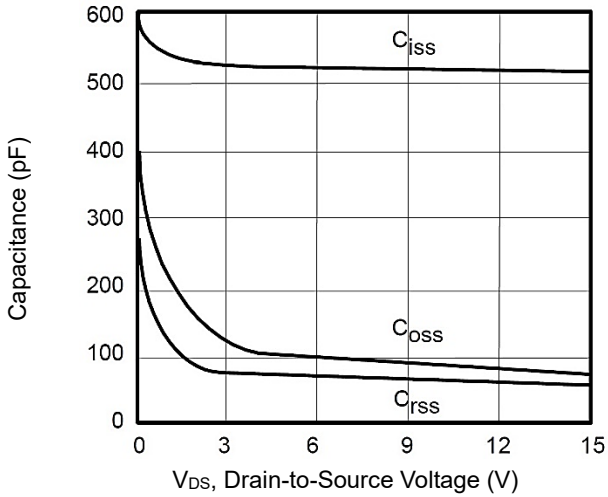
**On Region Characteristics**



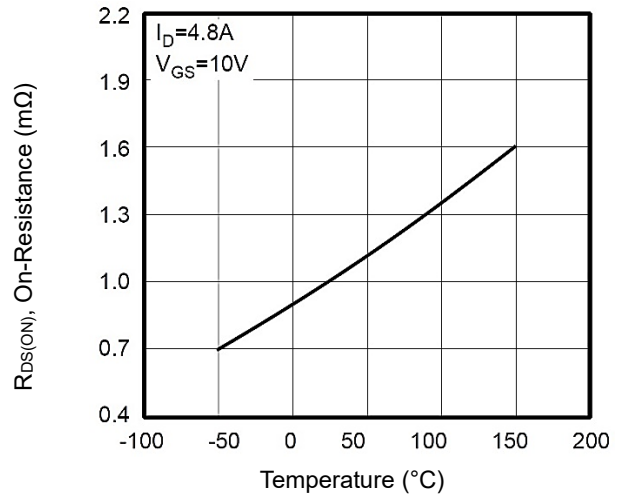
**Transfer Characteristics**



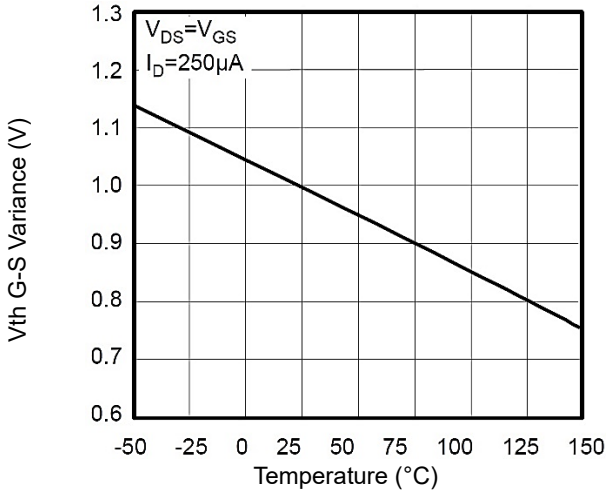
**Capacitance vs. Drain-Source Voltage**



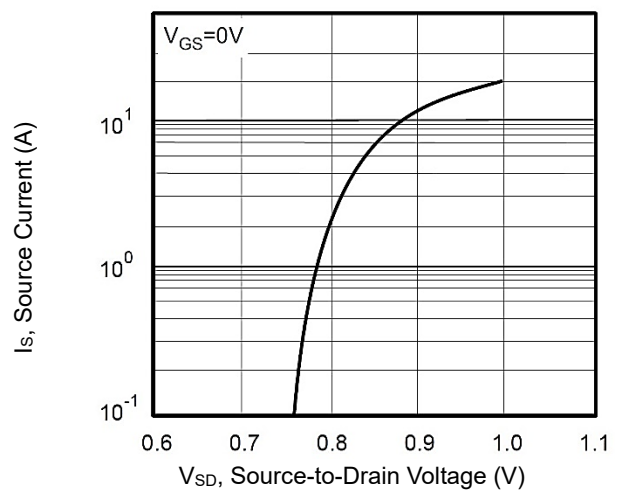
**On-Resistance vs. Junction Temperature**



**Threshold Voltage Variance vs. Temperature**

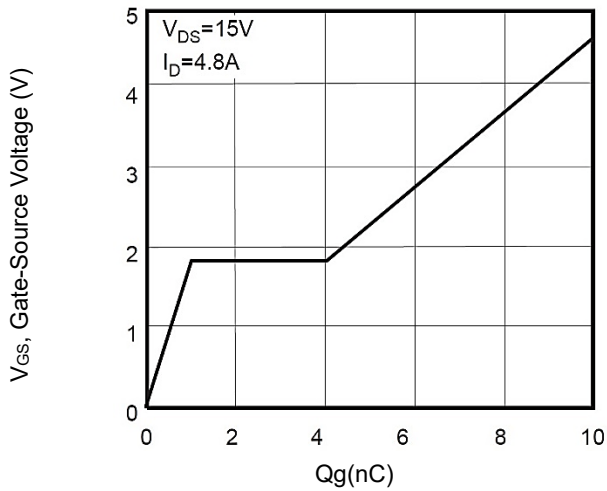


**Body Diode Characteristics**

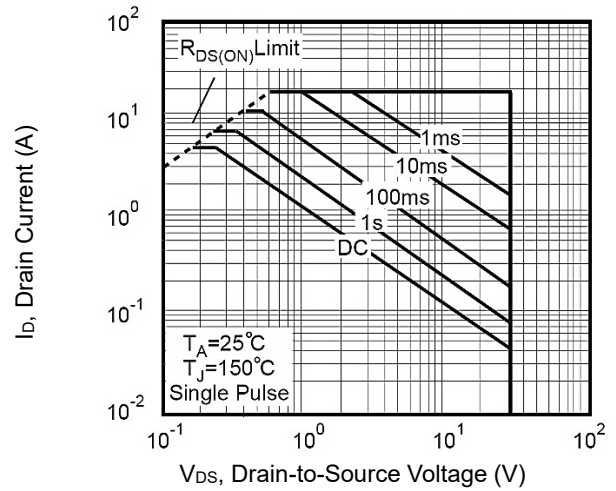


**CHARACTERISTIC CURVES**

**Gate Charge Characteristics**



**Maximum Safe Operating Area**



**Normalized Transient Thermal Impedance Curves**

