

N-Channel MOSFET

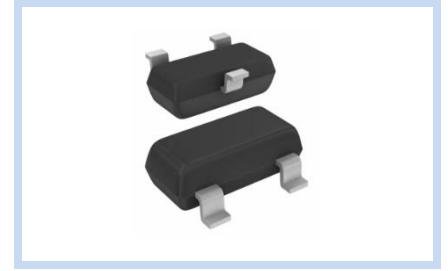
20V 3A 0.5W SOT-23

MFT2N3A0S23

MERITEK

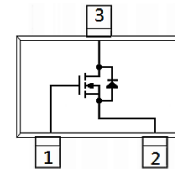
FEATURE

- $R_{DS(ON)} < 50m\Omega$, $V_{GS}=4.5V$, $I_D= 3A$
- $R_{DS(ON)} < 85m\Omega$, $V_{GS}=2.5V$, $I_D= 2A$
- Advanced Trench Poecess technology
- High Density Cell Design For Ultra Low On-Resistance
- Application: Switch Load, PWM Application, etc



MECHANICAL DATA

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

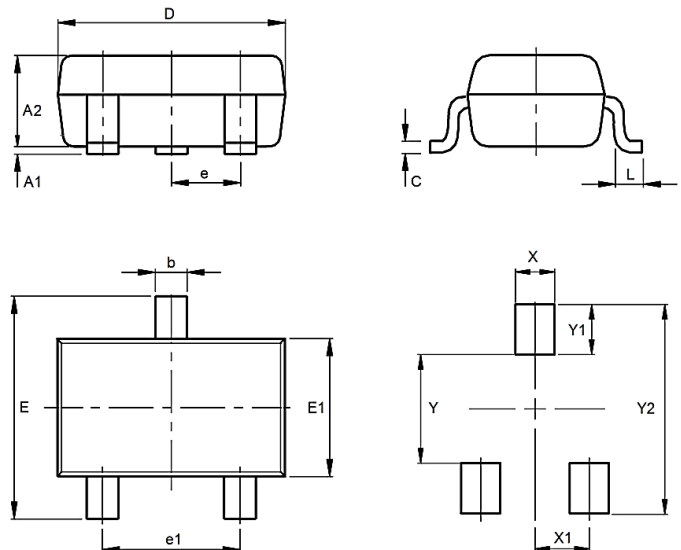


MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current – Continuous	I_D	3	A
Drain Current – Pulsed	Note2 I_{DM}	10	A
Power Dissipation	Note3 P_D	0.5	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^{\circ}C$
Thermal Resistance, Junction to Ambient	Note3 $R_{\theta JA}$	250	$^{\circ}C / W$
	Note4	90	

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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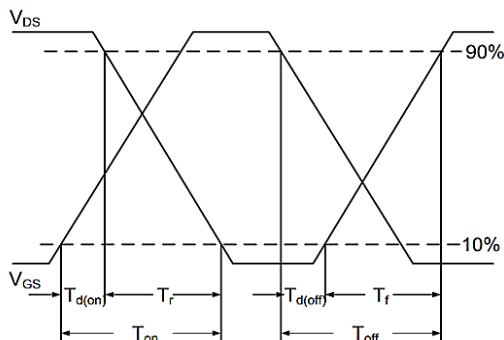
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	20	--	--	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}	--	--	± 0.1	μA
Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$	I_{DSS}	--	--	1	μA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=4.5V, I_D=3A$	$R_{DS(on)}$	--	--	50	m Ω
	$V_{GS}=2.5V, I_D=2A$		--	--	85	
Dynamic Characteristics	Conditions	Symbol	--	Typ.	Max	Unit
Input Capacitance	$V_{DS}=10V, V_{GS}=0V$ $F=1.0MHz$	C_{iss}	--	280	--	pF
Output Capacitance		C_{oss}	--	56	--	
Reverse Transfer Capacitance		C_{rss}	--	36	--	
Turn-On Delay Time	$V_{DD}=10V, I_D=3A,$ $V_{GS}=4.5V, R_G=4.5\Omega$	$T_{d(on)}$	--	3.8	--	nS
Rise Time		T_r	--	30	--	
Turn-Off Delay Time		$T_{d(off)}$	--	12	--	
Fall Time		T_f	--	20	--	
Total Gate Charge	$V_{DS}=10V, V_{GS}=4.5V, I_D=3A$	Q_g	--	4.0	--	nC
Gate-Source Charge		Q_{gs}	--	1.2	--	
Gate-Drain Charge		Q_{gd}	--	1.2	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Forward Transconductance	$V_{DS}=5V, I_D=3A$	g_{FS}	--	6	--	S
Diode Forward Voltage	$I_S=2.5A, V_{GS}=0V$	V_{SD}	--	--	1.1	V
Drain Continuous Forward Current	---	I_S	--	--	3	A
Reverse Recovery Time	$I_S=3A, di/dt=100A/\mu s$	t_{rr}	--	9.8	--	ns
Reverse Recovery Charge		Q_{rr}	--	2.1	--	nC

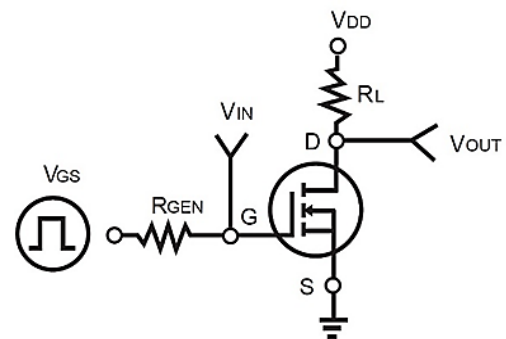
Notes:

- $T_A = 25^\circ C$, unless otherwise noted.
- Pulse width < 100 μs , Duty cycle < 2%. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^\circ C$
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad.
- Device mounted on FR-4 substrate PC board, 2oz copper, with 1 inch square copper plate in still air, $t \leq 10s$.

Switching Time Waveform

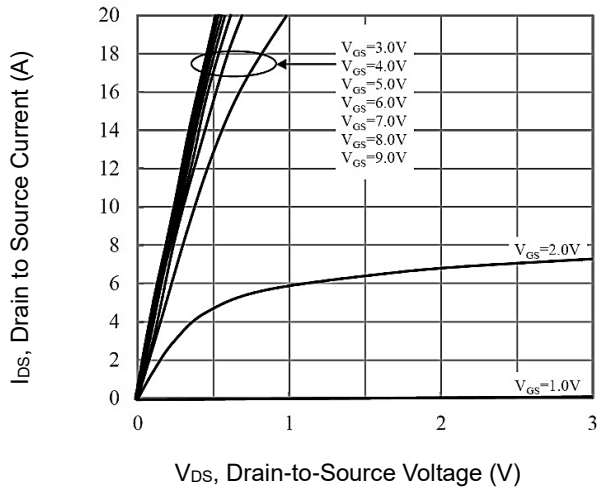


Switching Test Circuit

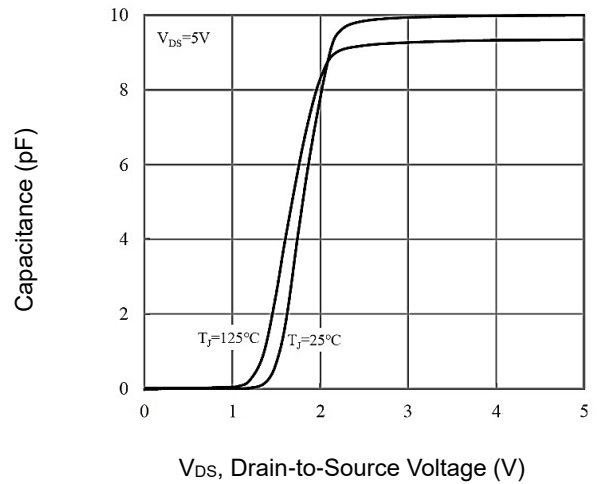


CHARACTERISTIC CURVES

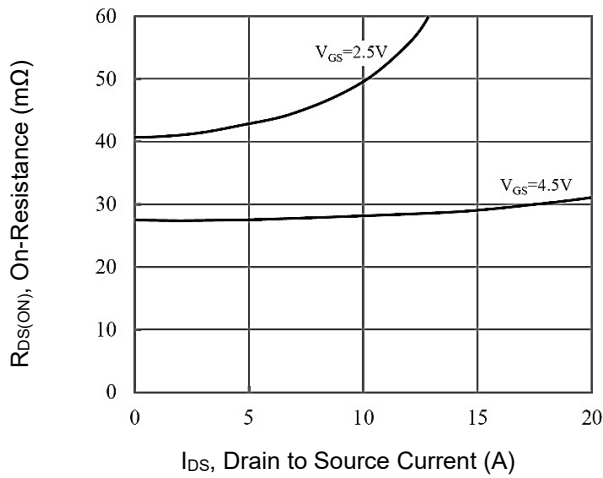
On Region Characteristics



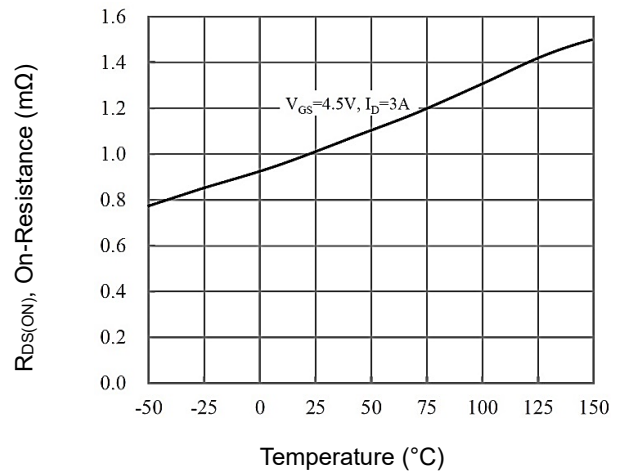
Capacitance vs. Drain-Source Voltage



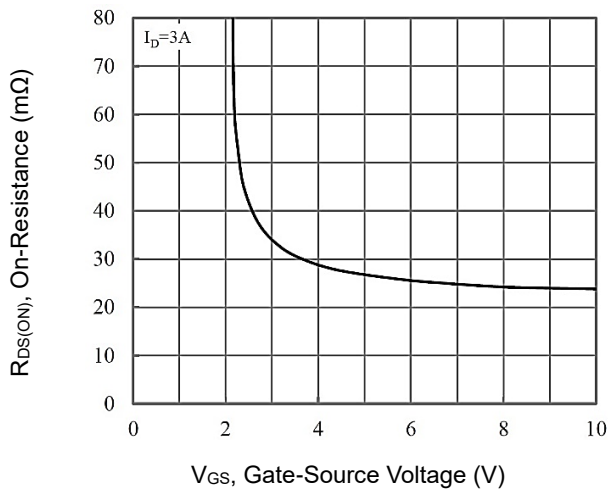
On-Resistance vs. Drain Current



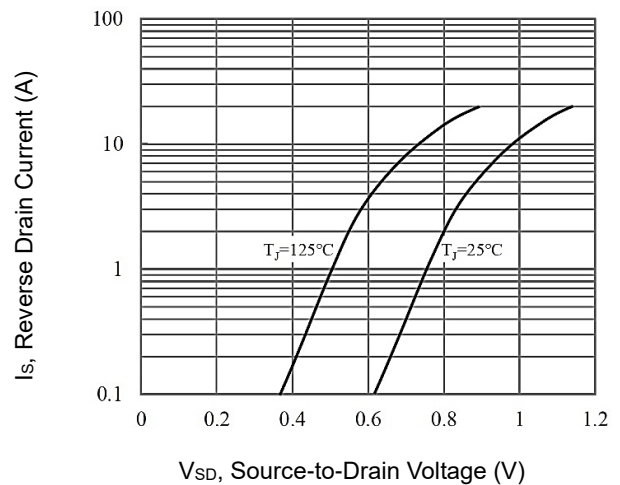
On-Resistance vs. Junction Temperature



On-Resistance Variation with Vgs

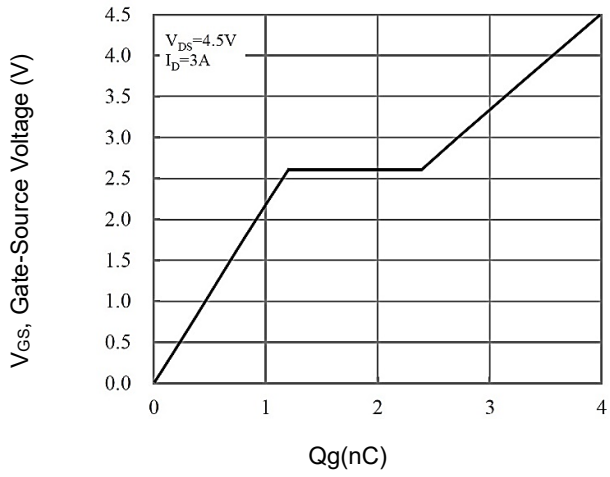


Body Diode Forward Voltage



CHARACTERISTIC CURVES

Gate Charge Characteristics



Threshold Voltage Variance vs. Temperature

