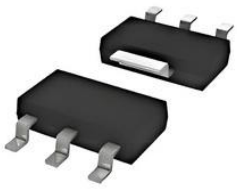
N-Channel MOSFET
100V 4A 2.7W SOT-223

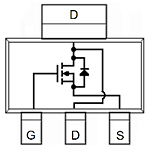
MFT10N4A0S223

MERITEK

FEATURE

- $R_{DS(ON)} \leqq 115m\Omega$ at $V_{GS}=10V$
- $R_{DS(ON)} \leqq 125m\Omega$ at VGS=4.5V
- Application: Power Management in Notebook, Battery Powered System





RoHS

MECHANICAL DATA

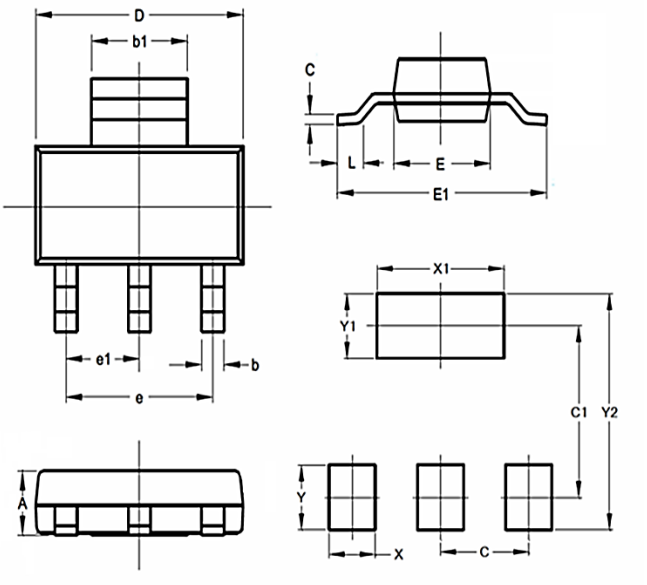
- Case: SOT-223 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current – Continuous	T_A= 25℃	I_D	4	A
	T_A= 70℃		3	
Drain Current – Pulsed		I_{DM}	20	A
Single Pulse Avalanche Current		I_{AS}	5	A
Single Pulse Avalanche Energy		E_{AS}	3.7	mJ
Power Dissipation		P_D	2.7	W
Thermal Resistance from Junction to Ambient	Note 4	$R_{\theta JA}$	100	°C / W
	Note 5		45	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C

DIMENSIONS

Item	Min (mm)	Max (mm)
A	1.50	1.80
b	0.60	0.80
b1	2.90	3.10
c	0.70	1.10
D	6.30	6.70
e	4.60	
e1	2.30	
E	3.30	3.70
E1	6.70	7.30
L	0.70	1.10
X	1.20	
X1	3.30	
Y	1.60	
Y1	1.60	
Y2	8.00	
C	2.30	
C1	6.40	

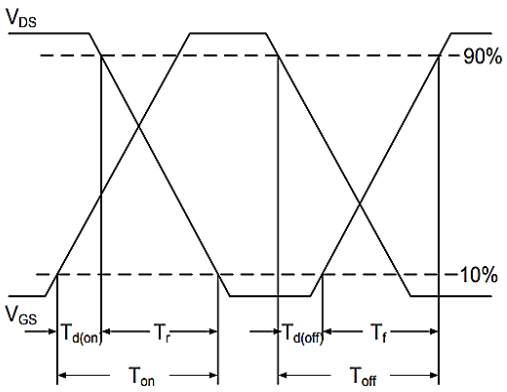


ELECTRICAL CHARACTERISTICS

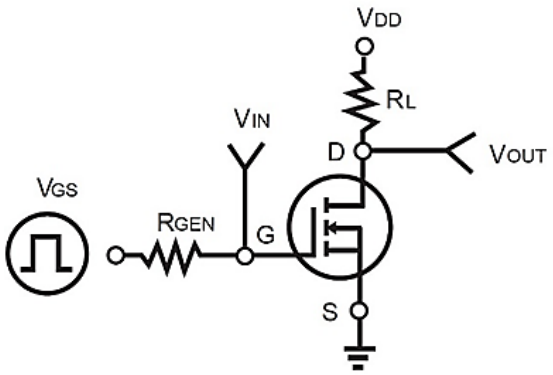
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= 250μA	BV_{DSS}	100	--	--	V
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=-250μA	$V_{GS(th)}$	1.2	--	2.5	V
Gate Leakage Current	V_{DS}=0V, V_{GS}=±20V	I_{GSS}	--	--	±0.1	μA
Zero Gate Voltage Drain Current	V_{DS}= 80V, V_{GS}=0V	I_{DSS}	--	--	1.0	μA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}= 10V, I_D= 4A	$R_{DS(ON)}$	--	106	115	mΩ
	V_{GS}= 4.5V, I_D= 3A		--	--	125	
Dynamic Characteristics	**Conditions**	**Symbol**	**--**	**Typ.**	**Max**	**Unit**
Forward Transfer Admittance	V_{DS}=5V, I_D≡4A	g_{FS}	--	8	--	S
Input Capacitance	V_{DS}=50V, V_{GS}=0V, F=1.0MHz	C_{iss}	--	1155	--	pF
Output Capacitance		C_{oss}	--	28	--	
Reverse Transfer Capacitance		C_{rss}	--	25	--	
Turn-On Delay Time	V_{DS} = 50V, I_D ≡-4A, V_{GS} =10V, R_G= 3.3Ω	$T_{d(on)}$	--	14	--	nS
Rise Time		T_r	--	4	--	
Turn-Off Delay Time		$T_{d(off)}$	--	13	--	
Fall Time		T_f	--	2	--	
Total Gate Charge	V_{DS}=50V, V_{GS}=4.5V, I_D≡4A	Q_g	--	9	--	nC
	V_{DS}=50V, V_{GS}=10V, I_D≡4A		--	20		
Gate-Source Charge		Q_{gs}	--	4	--	
Gate-Drain Charge		Q_{gd}	--	2	--	
Gate Resistance	V_{DS}=0V, V_{GS}=0V, F=1.0MHz	R_g	--	1.1	--	Ω
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Forward Voltage	I_S= 1A,V_{GS}=0V	V_{SD}	--	--	1.2	V
Diode Forward Current	--	I_S	--	--	4	A
Diode Pulse Current	--	I_{SM}	--	--	20	A
Reverse Recovery Time	I_S= 4A, di/dt=100A/μs	t_{rr}	--	21	--	ns
Reverse Recovery Charge		Q_{rr}	--	22	--	nC

Note:
1. T_A = 25°C unless otherwise noted.
2. Pulse test: Pulse width<100μs, Duty cycle<2%. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150℃.
3. Limited by $T_{J(MAX)}$, starting T_J=25°C, L=0.3mH, R_g=25Ω , I_{AS}=5A, V_{GS}=10V.
4. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate, t<10s.
5. Device mounted on FR-4 substrate PC board, minimum recommended footprint. Steady state

Switching Time Waveform

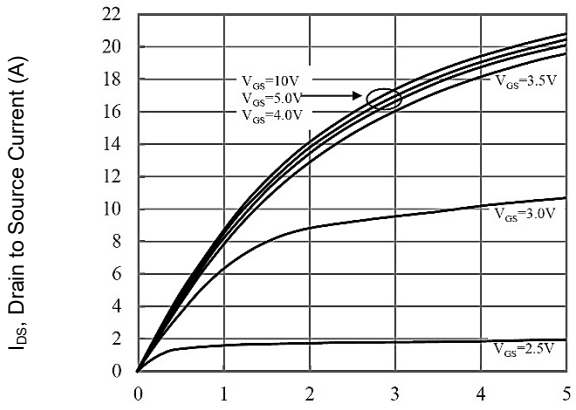


Switching Test Circuit

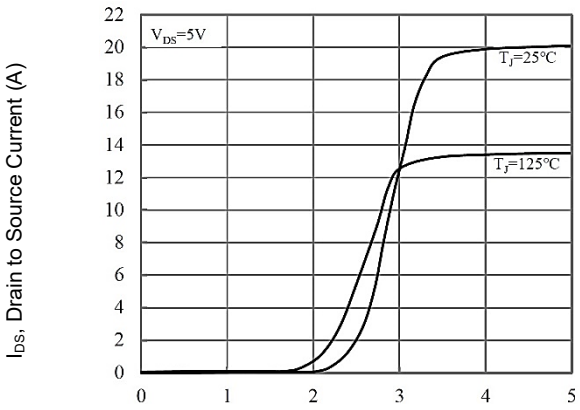


CHARACTERISTIC CURVES

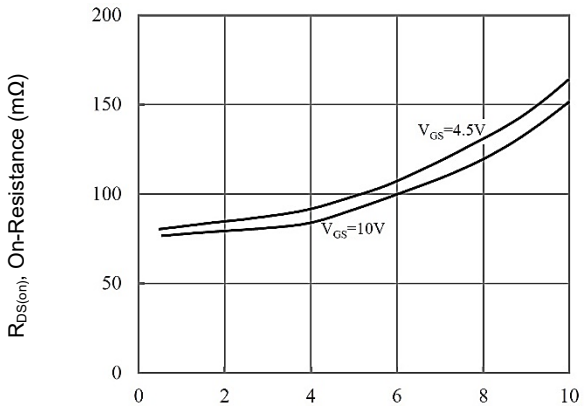
On-Region Characteristic



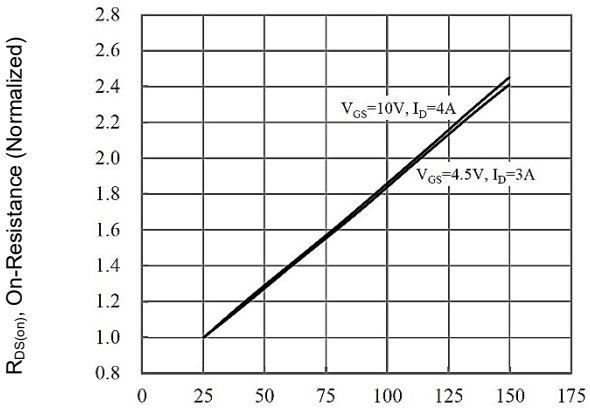
Transfer Characteristics



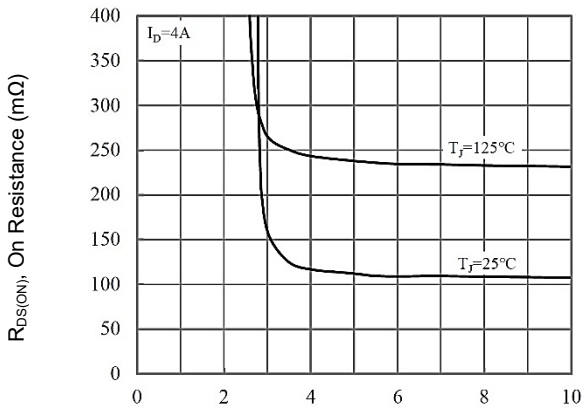
On-Resistance vs. Drain Current



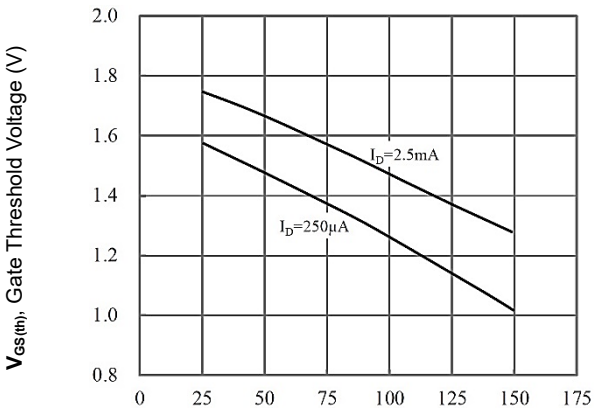
On-Resistance vs. Junction Temperature



On-Resistance Variation with V_{GS}

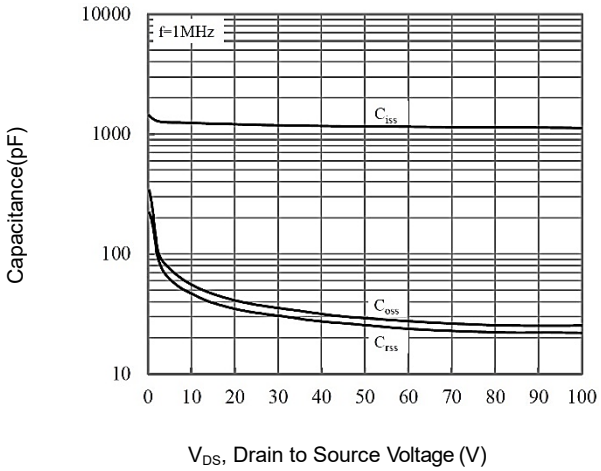


Gate Threshold Voltage vs. Temperature

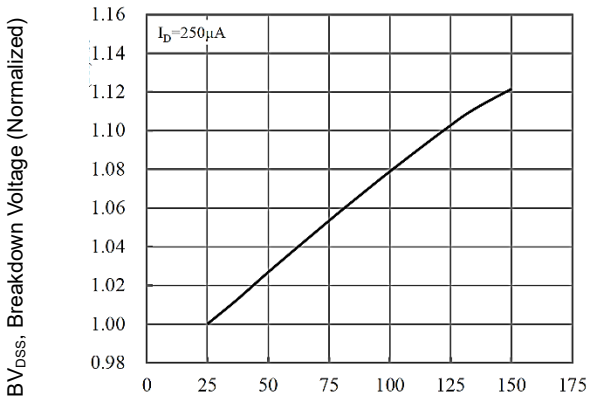


CHARACTERISTIC CURVES

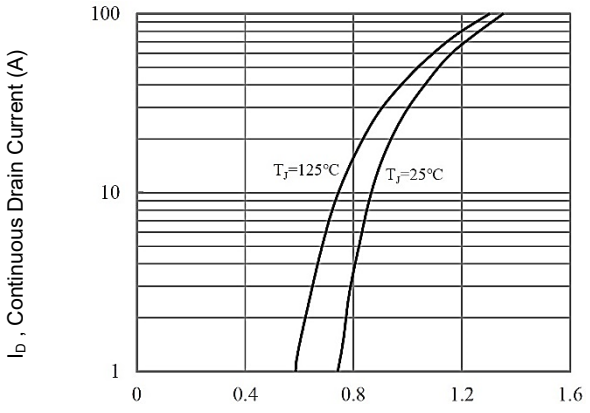
Capacitance vs. Drain-Source Voltage



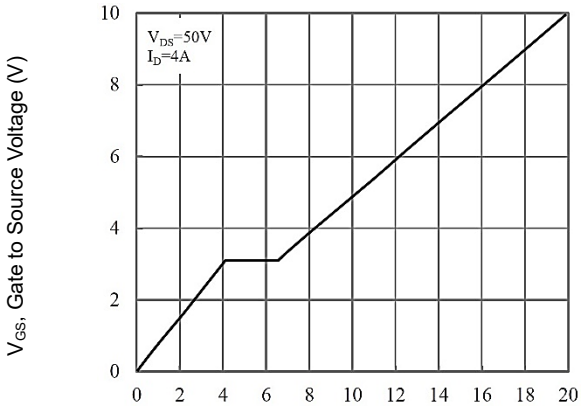
Breakdown Voltage vs Temperature



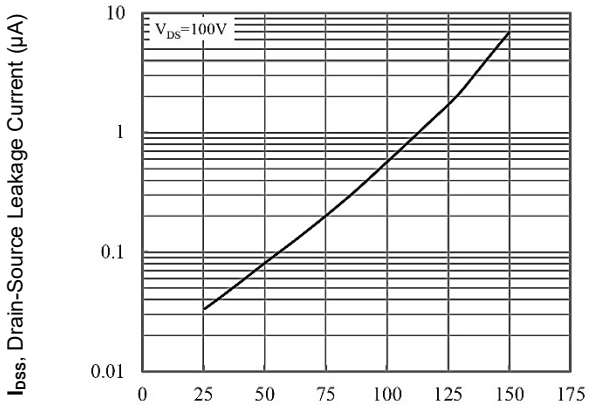
Source-Drain Diode Forward Voltage



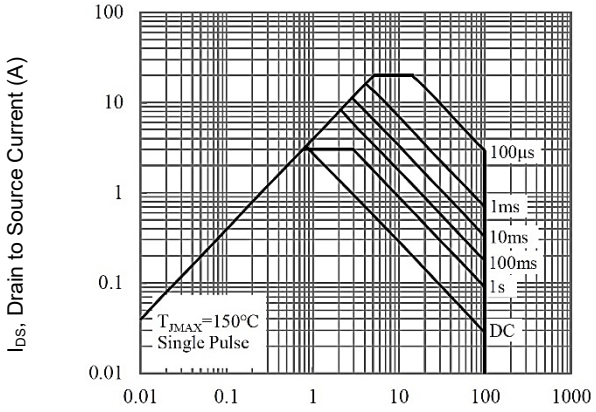
Gate-Charge Characteristics



Drain-Source Leakge Current

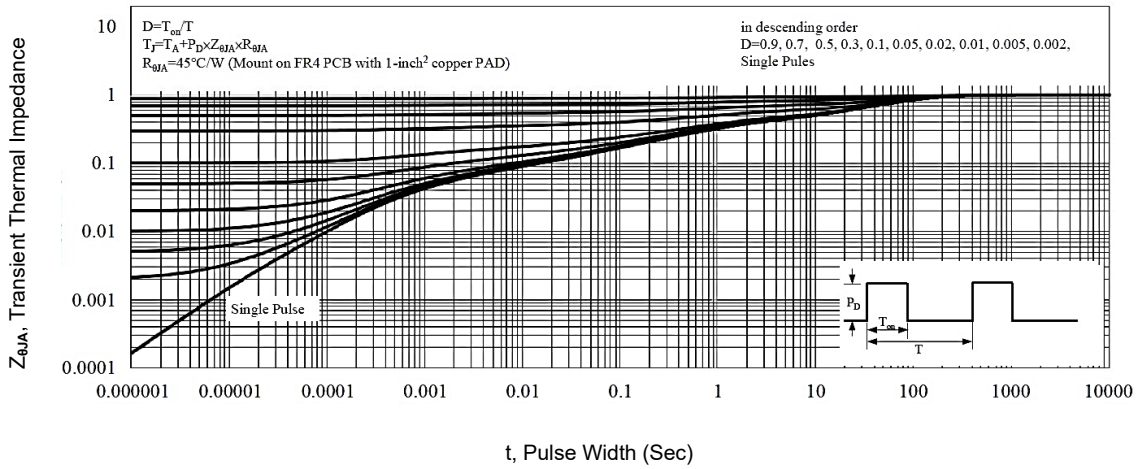


Maximum Safe Operating Area



CHARACTERISTIC CURVES

Normalized Transient Thermal Impedance



t, Pulse Width (Sec)