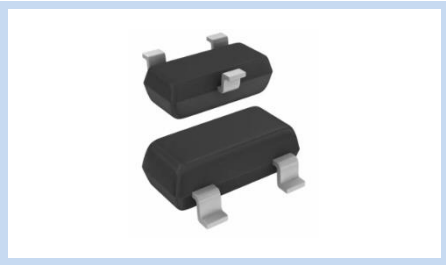
N-Channel MOSFET
100V 200mA 0.5W SOT-23 ESD

MFT10NA20S23E

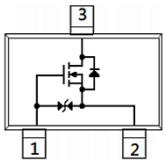
MERITEK

FEATURE



- $R_{DS(ON)}$≤6Ω, V_{GS}=10V, I_D=190mA
- $R_{DS(ON)}$≤10Ω, V_{GS}=4.5V, I_D=150mA
- ESD Protected Gate
- Low Input Capacitance
- Application: DC-DC Converters, Switch Load, PWM, Motor Control

MECHANICAL DATA



RoHS

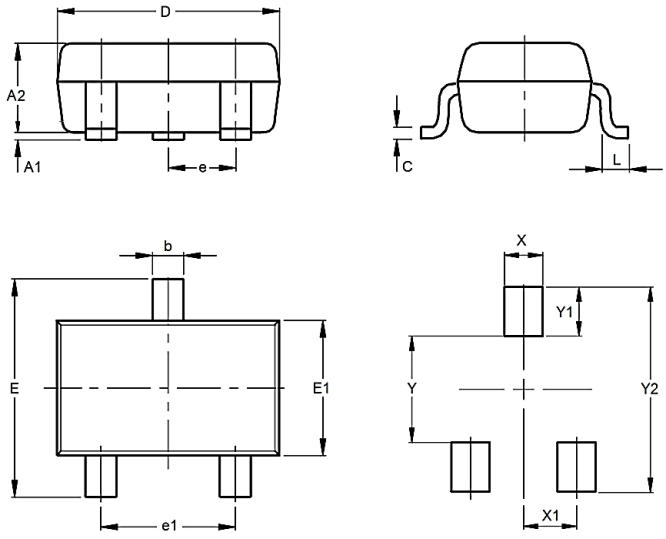
- Case: SOT-23 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current – Continuous		I_D	200	mA
Drain Current – Pulsed	Note 1	I_{DM}	600	mA
Power Dissipation		P_D	500	mW
Operating Junction and Storage Temperature Range		T_J ,T_{stg}	-55 to 150	°C
Thermal Resistance, Junction to Ambient	Note 2	$R_{\theta JA}$	250	°C / W

DIMENSIONS

Item	Min (mm)	Max (mm)
A1	0.00	0.10
A2	0.79	1.40
b	0.30	0.50
c	0.08	0.20
D	2.70	3.10
e	0.89	1.02
e1	1.78	2.04
E	2.10	2.80
E1	1.20	1.60
L	0.15	--
X	0.80	
X1	0.95	
Y	1.40	
Y1	1.00	
Y2	3.40	

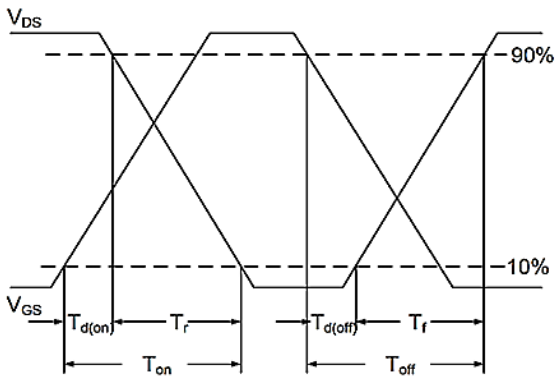


ELECTRICAL CHARACTERISTICS

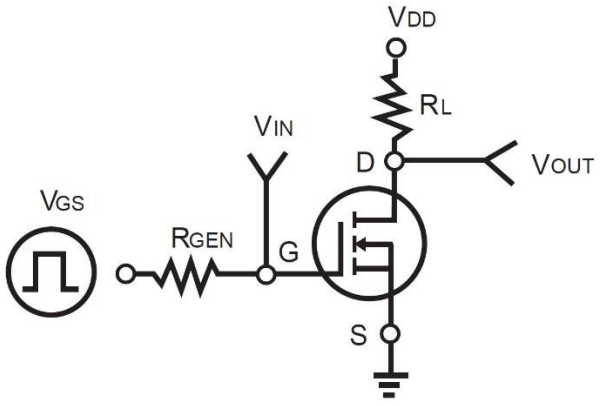
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= 250μA	BV_{DSS}	100	--	--	V
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D= 1mA	$V_{GS(th)}$	1.5	--	2.5	V
Gate Leakage Current	V_{DS}=0V, V_{GS}=±20V	I_{GSS}	--	--	±10	μA
Zero Gate Voltage Drain Current	V_{DS}= 80V, V_{GS}=0V	I_{DSS}	--	--	1	μA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}= 10V, I_D= 190mA	$R_{DS(ON)}$	--	--	6	Ω
	V_{GS}= 4.5V, I_D= 150mA		--	--	10	
Dynamic Characteristics	**Conditions**	**Symbol**	**--**	**Typ.**	**Max**	**Unit**
Gate resistance	V_{DS}=0V, F=1MHz	R_g	--	38	--	Ω
Input Capacitance	V_{DS}= 50V, V_{GS}=0V, F=1MHz	C_{iss}	--	39	--	pF
Output Capacitance		C_{oss}	--	10	--	
Reverse Transfer Capacitance		C_{rss}	--	6.6	--	
Turn-On Delay Time	V_{DD} = 50V, I_D ≡ 190mA, V_{GS} = 10V, R_G= 6Ω	$T_{d(on)}$	--	6.5	--	nS
Rise Time		T_r	--	7.5	--	
Turn-Off Delay Time		$T_{d(off)}$	--	10	--	
Fall Time		T_f	--	85	--	
Total Gate Charge	V_{DS}= 30V, V_{GS}= 10V, I_D≡ 1A	Q_g	--	1.5	--	nC
Gate-Source Charge		Q_{gs}	--	0.5	--	
Gate-Drain Charge		Q_{gd}	--	0.6	--	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Forward Voltage	I_S= 0.1A, VGS=0V	V_{SD}	--	--	1.2	V

Note:
1. Pulse width<100μs, Duty cycle<2%; Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
2. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air.

Switching Time Waveform

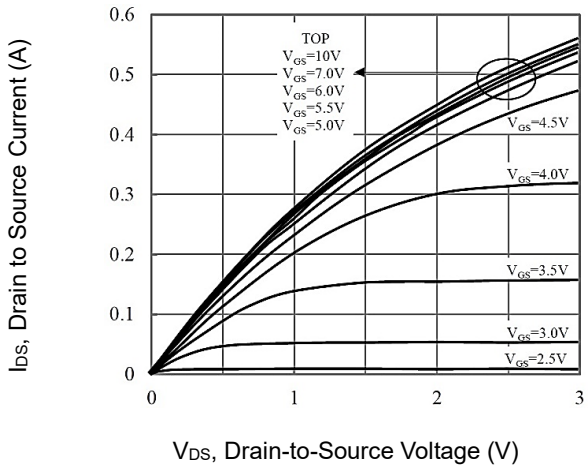


Switching Test Circuit

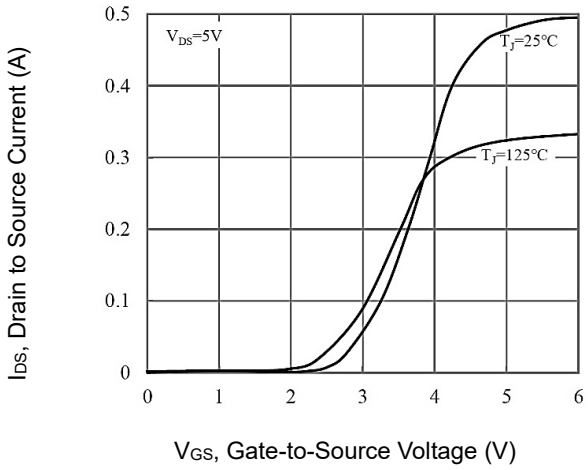


CHARACTERISTIC CURVES

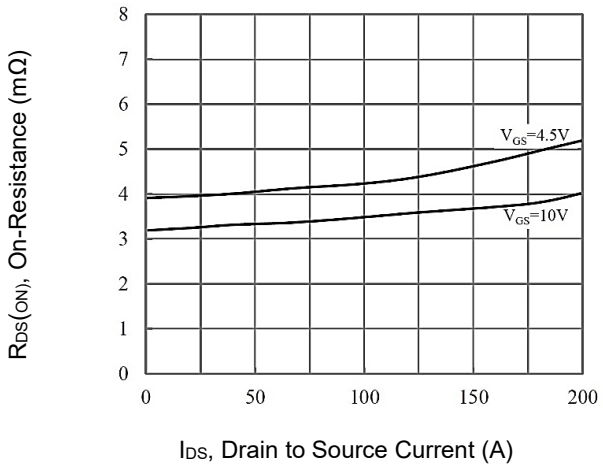
On Region Characteristics



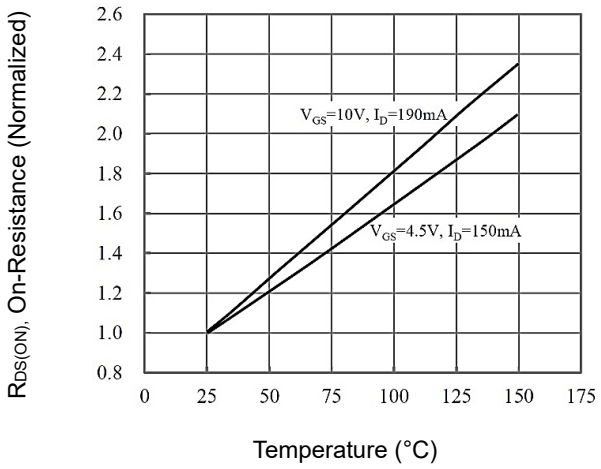
Transfer Characteristics



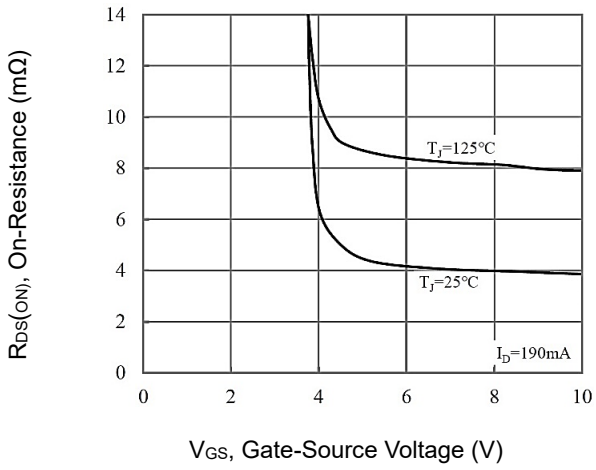
On-Resistance vs. Drain Current



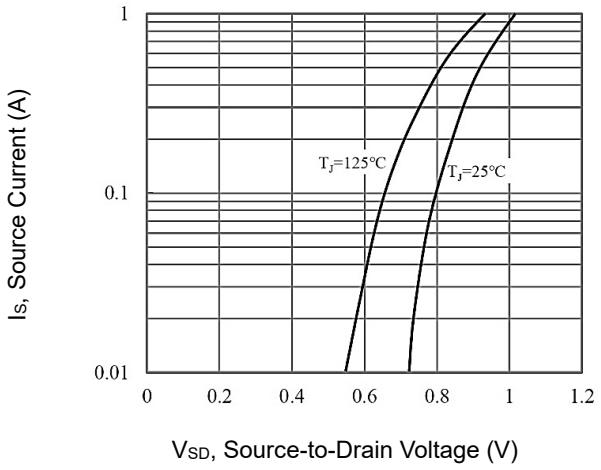
On-Resistance vs. Junction Temperature



On-Resistance Variation with V_{GS}

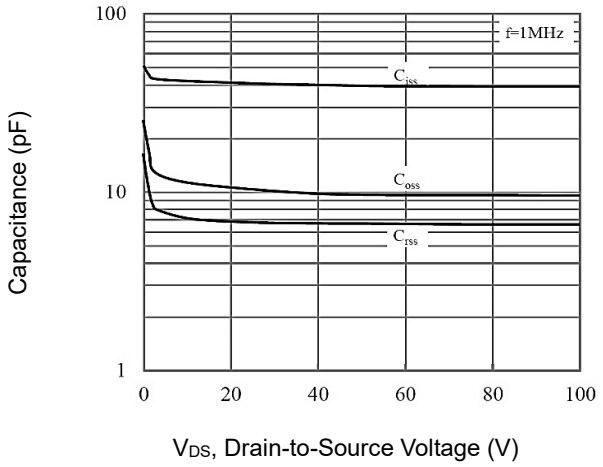


Body Diode Characteristics

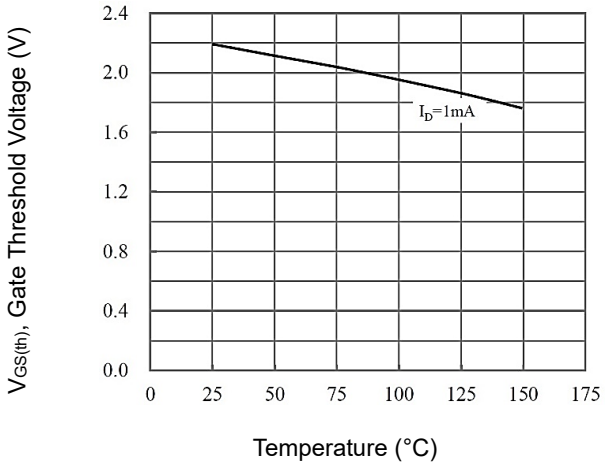


CHARACTERISTIC CURVES

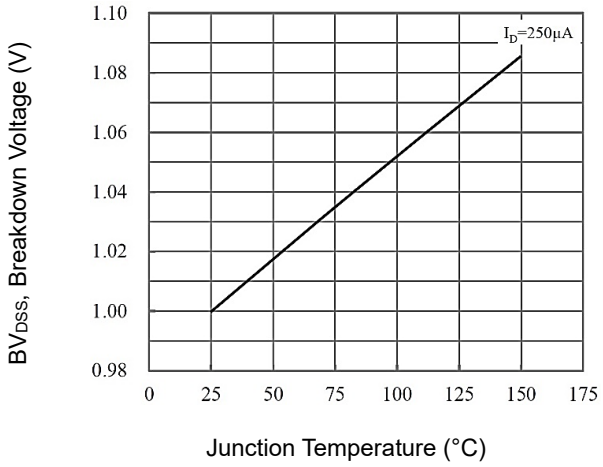
Capacitance vs. Drain-Source Voltage



Threshold Voltage Variance



Breakdown Voltage vs Junction Temperature



Safe Operating Area