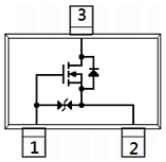
N-Channel MOSFET
60V 0.6A 0.8W SOT-23 ESD

MFT6NA6S23E

MERITEK

FEATURE

- $R_{DS(ON)}$=1.5Ω, V_{GS}=10V
- $R_{DS(ON)}$=1.8Ω, V_{GS}=4.5V
- Voltage Controlled Small Signal Switch
- Low Input Capacitance
- Fast Switching Speed
- Application: Battery Operated Systems, Solid-State Relays, Direct TTL/CMOS Logic-Level Interface



RoHS

MECHANICAL DATA

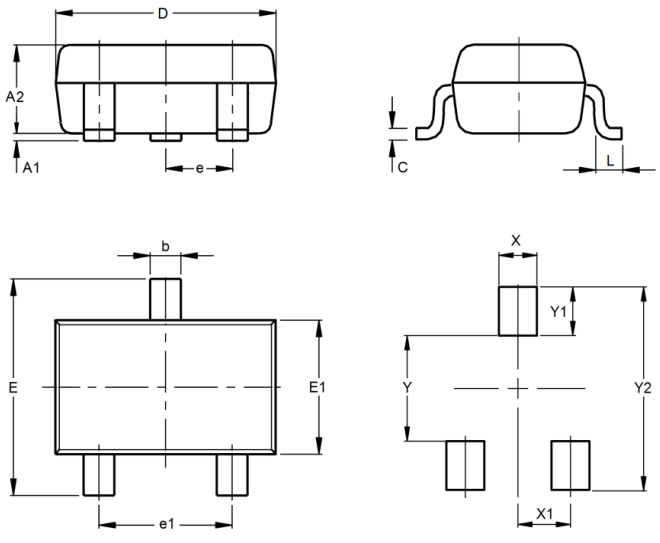
- Case: SOT-23 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current – Continuous	I_D	0.6	A
Drain Current – Pulsed	I_{DM}	1.5	A
Power Dissipation	P_D	0.8	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	150	°C / W
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to 150	°C

DIMENSIONS

SOT-23	Min (mm)	Max (mm)
A1	0.00	0.10
A2	0.90	1.05
b	0.30	0.50
c	0.08	0.20
D	2.80	3.00
e	0.95 TYP	
e1	1.80	2.00
E	2.25	2.55
E1	1.20	1.40
L	0.30	0.50
X	0.80	
X1	0.95	
Y	1.40	
Y1	1.00	
Y2	3.40	

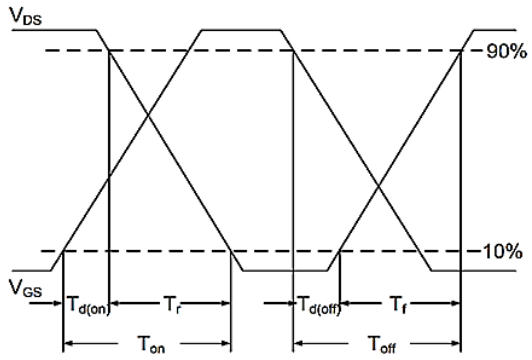


ELECTRICAL CHARACTERISTICS

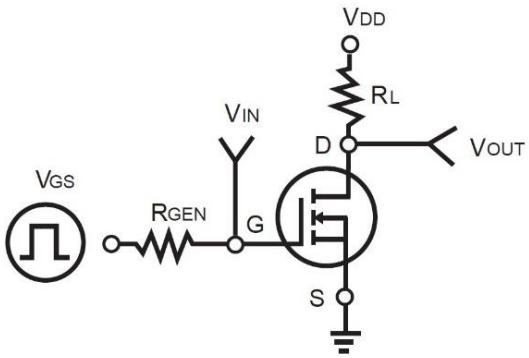
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= 250μA	BV_{DSS}	60	--	--	V
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D= 250μA	$V_{GS(th)}$	0.5	1.1	1.5	V
Gate Leakage Current	V_{DS}=0V, V_{GS}=±20V	I_{GSS}	--	--	±10	μA
Zero Gate Voltage Drain Current	V_{DS}= 60V, 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= 600mA	$R_{DS(ON)}$	--	1.1	1.5	Ω
	V_{GS}= 4.5V, I_D= 200mA		--	1.25	1.8	
Dynamic Characteristics	**Conditions**	**Symbol**	**--**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{GS}=10V, V_{DS}=30V, I_D ≡1A	Qg	--	1.4	--	nC
Gate-Source Charge		Qgs	--	0.5	--	
Gate-Drain Charge		Qgd	--	0.2	--	
Input Capacitance	V_{DS}=30V, V_{GS}=0V, F=1.0MHz	C_{iss}	--	25	--	pF
Output Capacitance		C_{oss}	--	7	--	
Reverse Transfer Capacitance		C_{rss}	--	3	--	
Turn-On Delay Time	V_{DD}=30V, I_D ≡1A, V_{GS} =10V, R_G= 2.3Ω	$T_{d(on)}$	--	4	--	nS
Rise Time		T_r	--	19	--	
Turn-Off Delay Time		$T_{d(off)}$	--	9	--	
Fall Time		T_f	--	25	--	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Forward Current	-	I_S	--	--	0.6	A
Diode Forward Voltage	I_S= 0.6A, VGS=0V	V_{SD}	--	--	1.3	V

Note:
1. T_J = 25°C, unless otherwise noted.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. Pd is based on max. junction temperature, using junction-case thermal resistance.

Switching Time Waveform

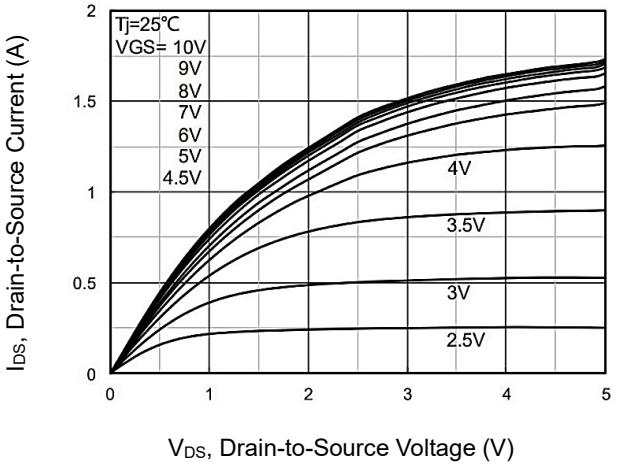


Switching Test Circuit

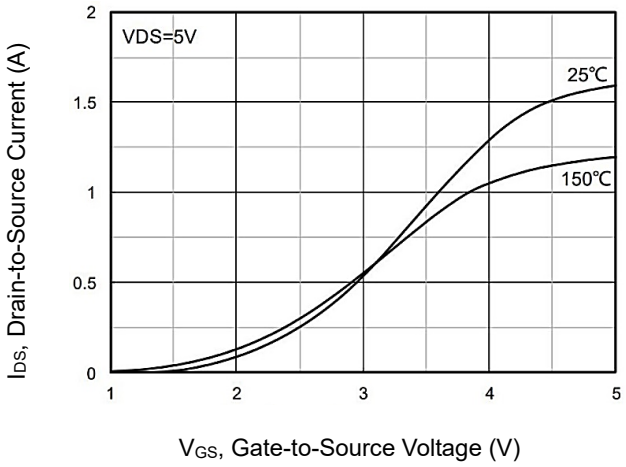


CHARACTERISTIC CURVES

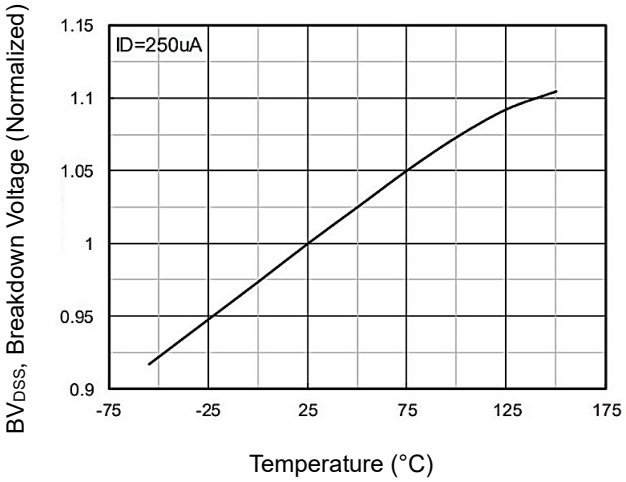
Output Characteristics



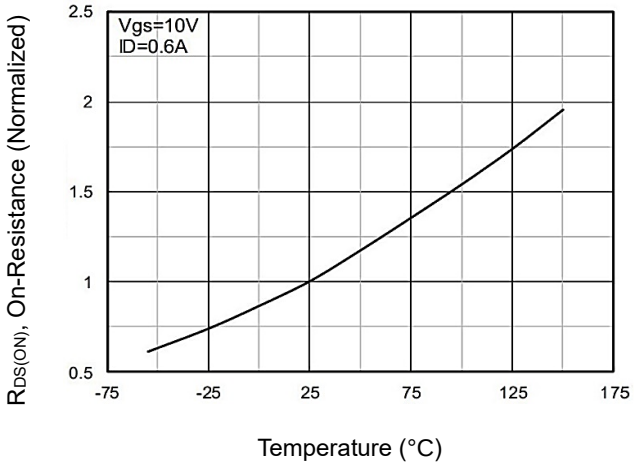
Transfer Characteristics



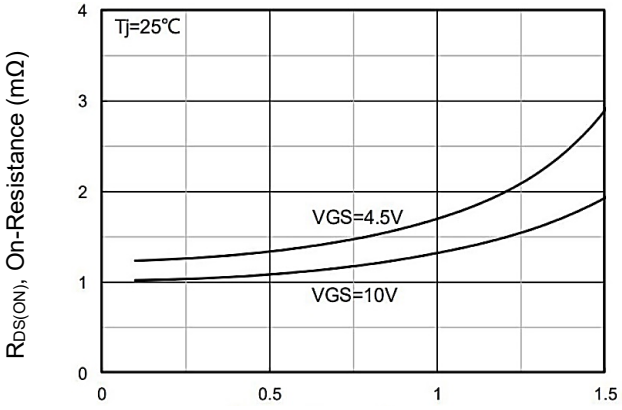
Breakdown Voltage vs. Temperature



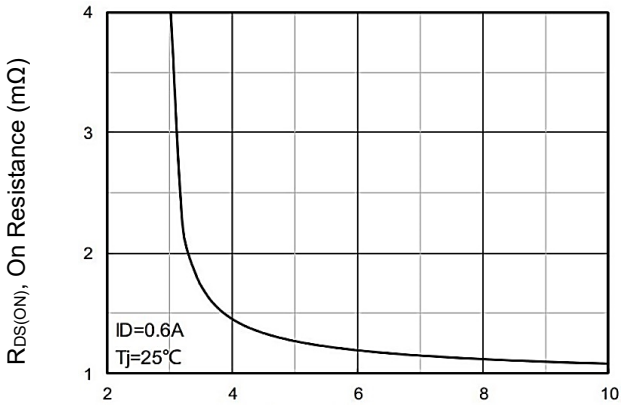
On-Resistance vs. Junction temperature



On-Resistance vs. Drain Current

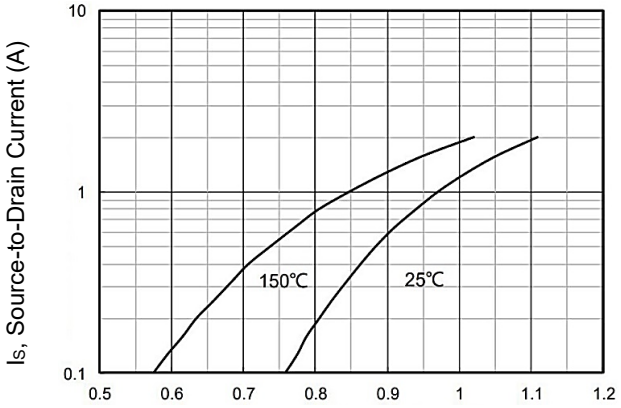


On-Resistance Variation with V_{GS}

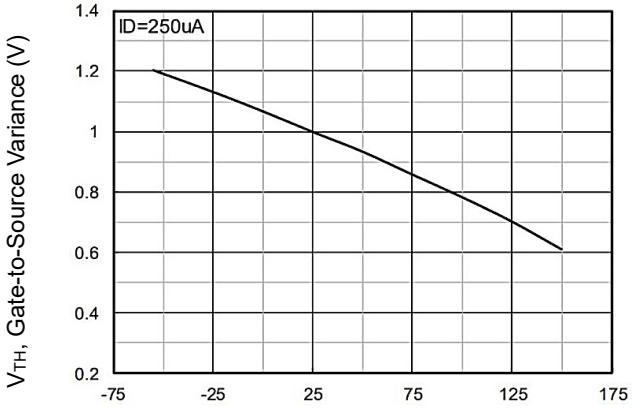


CHARACTERISTIC CURVES

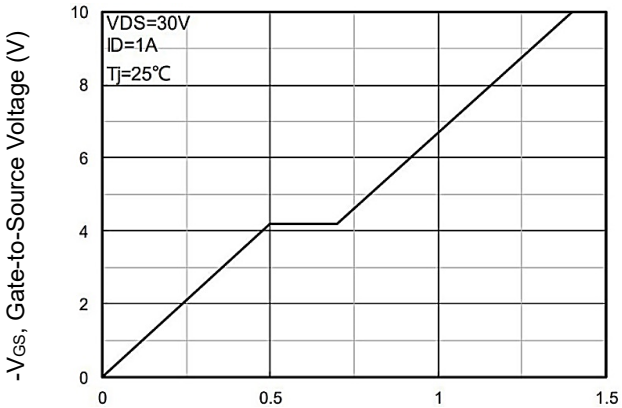
Body Diode Forward Voltage



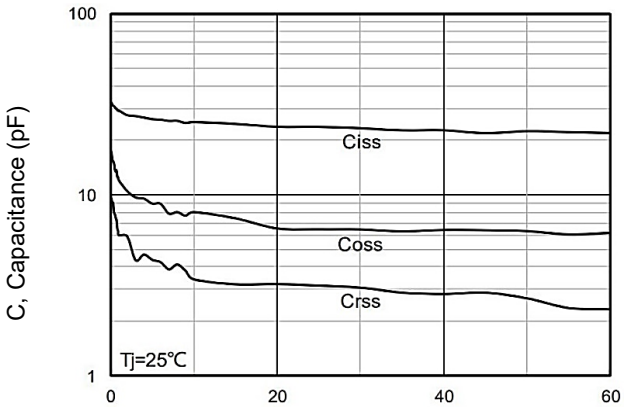
Threshold Voltage Variation with Temperature



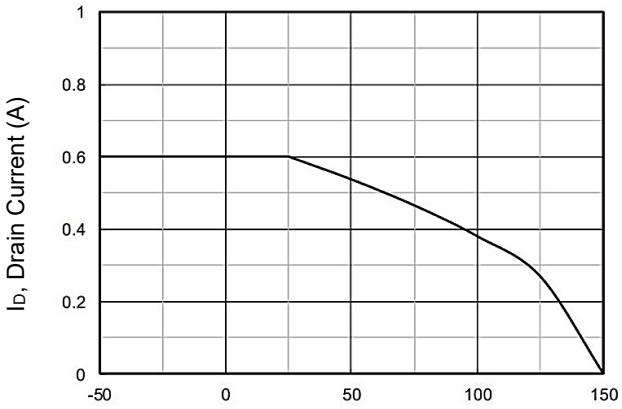
Gate Charge



Capacitance



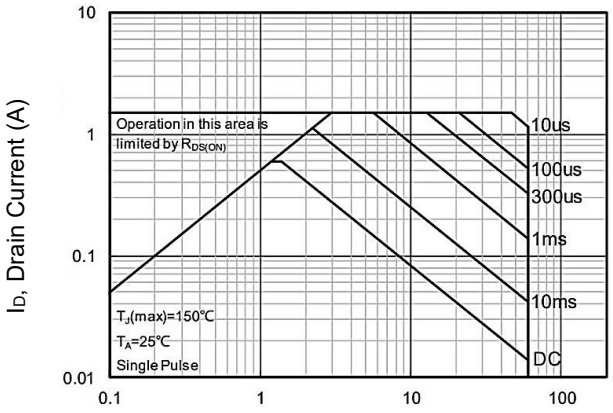
Current Dissipation



Power Dissipation

CHARACTERISTIC CURVES

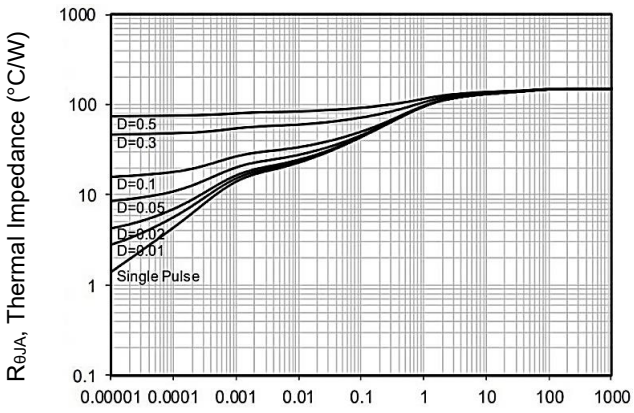
Maximum Safe Operating Area



I_D, Drain Current (A)

V_{DS}, Drain-Source Voltage (V)

Maximum Transient Thermal Impedance



$R_{\theta JA}$, Thermal Impedance (°C/W)

Square Wave Pulse Duration (s)