N-Channel MOSFET
600V 30mA 0.5W SOT-23 ESD

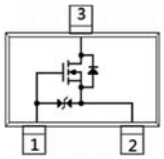
MFT60NA03S23E

MERITEK

FEATURE

- $R_{DS(ON)}$ < 500Ω, V_{GS}=0V, I_D=3mA
- $R_{DS(ON)}$ < 500Ω, V_{GS}=10V, I_D=16mA
- Low Input Capacitance
- ESD Diode Protected
- Application: DC-DC Converter, PWN Powered System, Motor Control

MECHANICAL DATA



RoHS

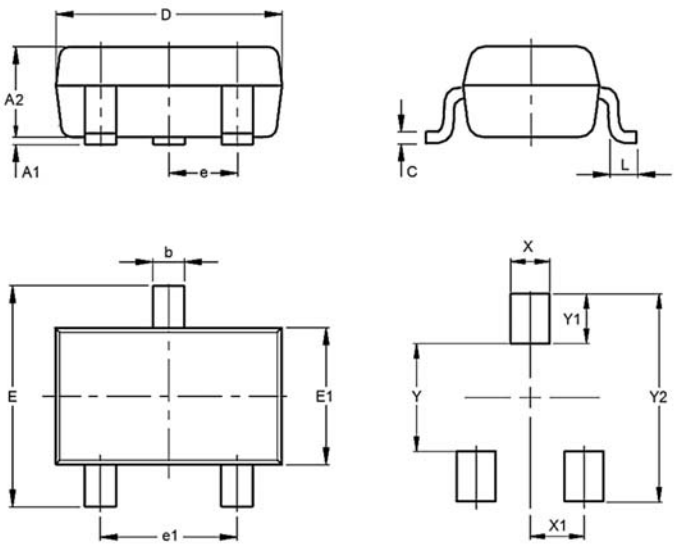
- Case: SOT-23 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	600	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current – Continuous	T_C=25°C	I_D	30	mA
	T_C=70°C		24	
Drain Current – Pulsed		I_{DM}	120	mA
Electrostatic Discharge Rating	HBM: C=100pF, R=1.5KΩ	V_{ESD}	300	V
Power Dissipation		P_D	500	mW
Thermal Resistance, Junction to Ambient		$R_{\theta JA}$	250	°C / W
Operating Junction 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	0.79	1.40
b	0.30	0.50
c	0.08	0.20
D	2.70	3.10
e	0.95 TYP	
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	1.00	
Y1	1.00	
Y2	3.00	

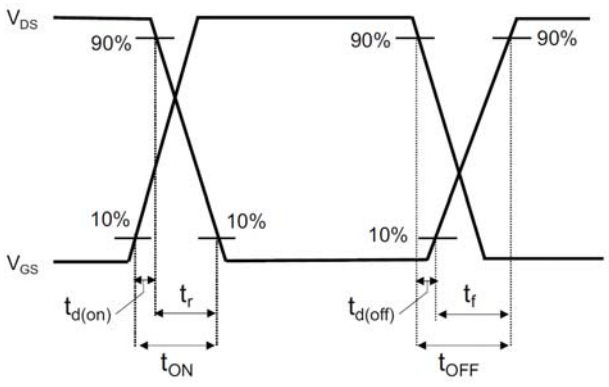


ELECTRICAL CHARACTERISTICS

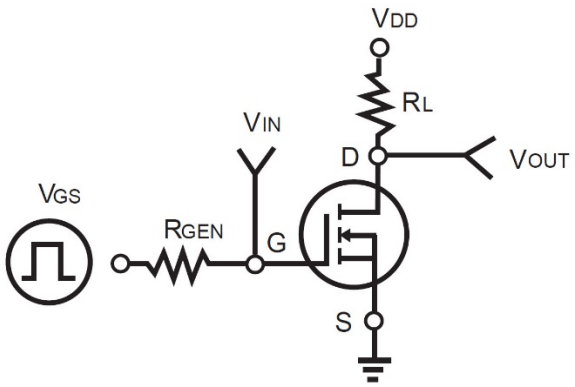
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=-5V, I_D= 250μA	BV_{DSS}	600	--	--	V
Gate-Source Breakdown Voltage	I_{GS}=±1A (Open Drain)	V_{GSO}	30	--	--	
Gate Threshold Voltage	V_{DS}=3V, I_D= 8μA	$V_{GS(th)}$	-2.7	--	-1.0	V
Gate Leakage Current	V_{DS}=0V, V_{GS}=±20V	I_{GSS}	--	--	±10	μA
Zero Gate Voltage Drain Current	V_{DS}= 600V, V_{GS}=-5V	I_{DSS}	--	--	0.1	μA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}= 0V, I_D= 3mA	$R_{DS(ON)}$	--	--	500	Ω
	V_{GS}= 10V, I_D= 16mA		--	--	500	
Dynamic Characteristics	**Conditions**	**Symbol**	**--**	**Typ.**	**Max**	**Unit**
Input Capacitance	V_{DS}= 25V, V_{GS}=-5V, F=1MHz	C_{iss}	--	10	--	pF
Output Capacitance		C_{oss}	--	2.9	--	
Reverse Transfer Capacitance		C_{rss}	--	0.12	--	
Turn-On Delay Time	V_{DD}=300V, I_D ≡ 10mA, V_{GS}=-5~7V, R_G= 6Ω	$T_{d(on)}$	--	12	--	nS
Rise Time		T_r	--	60	--	
Turn-Off Delay Time		$T_{d(off)}$	--	25	--	
Fall Time		T_f	--	100	--	
Total Gate Charge	V_{DS}= 400V, V_{GS}= -5~7V, I_D≡ 10mA	Q_g	--	2.8	--	nC
Gate-Source Charge		Q_{gs}	--	0.55	--	
Gate-Drain Charge		Q_{gd}	--	1.6	--	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Forward Voltage	I_S= 16mA,V_{GS}=-5V	V_{SD}	--	--	1.2	V
Reverse Recovery Time	V_R=300V, I_S=10mA, di/dt=100A/μs	t_{rr}	--	--	367	nS
Reverse Recovery Charge		Q_{rr}	--	--	963	nC

Note:
1. T_A = 25°C Exposure to absolute maximum rating conditions for extended periods may remain possibility to affect device reliability
2. Pulse width<100μs, Duty cycle<2%.
3. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
4. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch^2 copper plate.

Switching Time Waveform

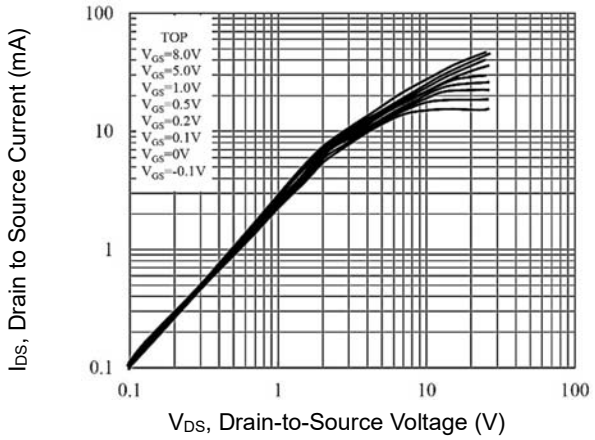


Switching Test Circuit

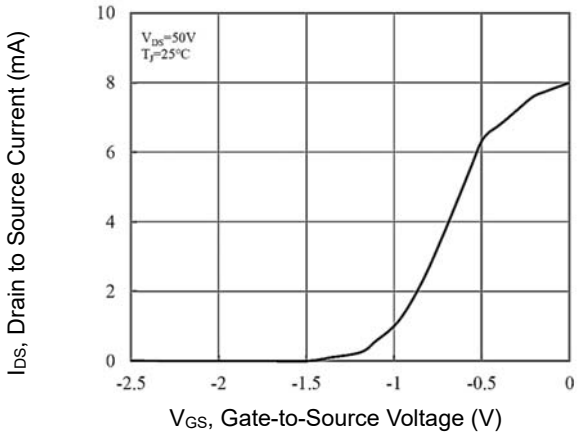


CHARACTERISTIC CURVES

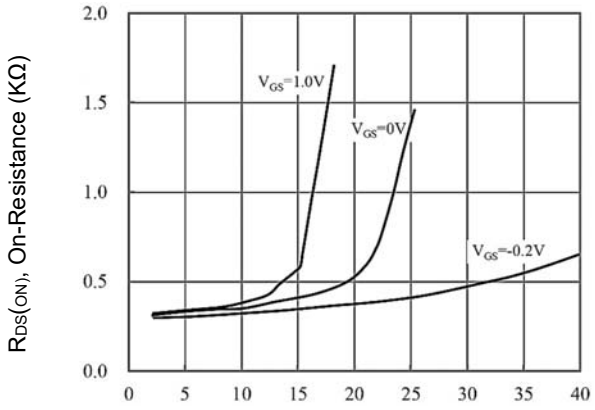
On Region Characteristics



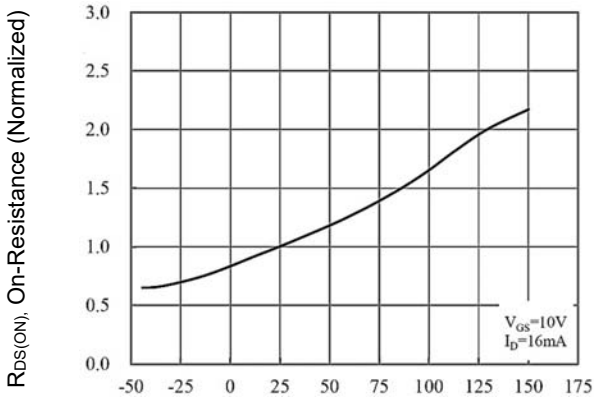
Transfer Characteristics



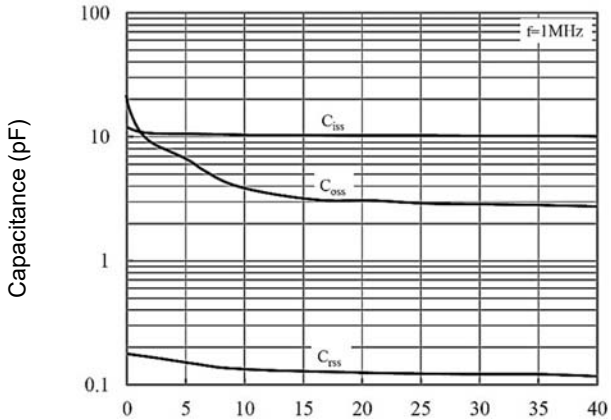
On-Resistance vs. Drain Current



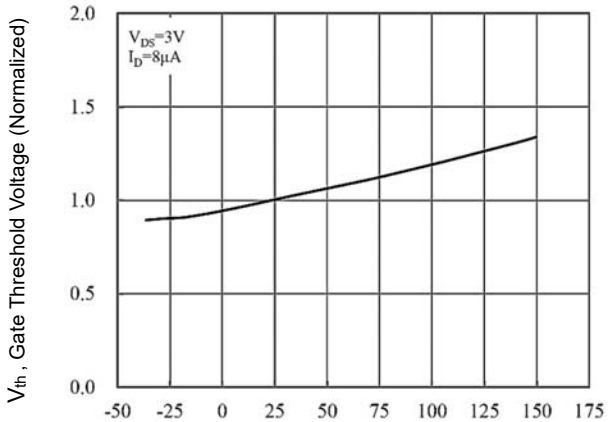
Normalized On-Resistance



Capacitance vs. Drain-Source Voltage

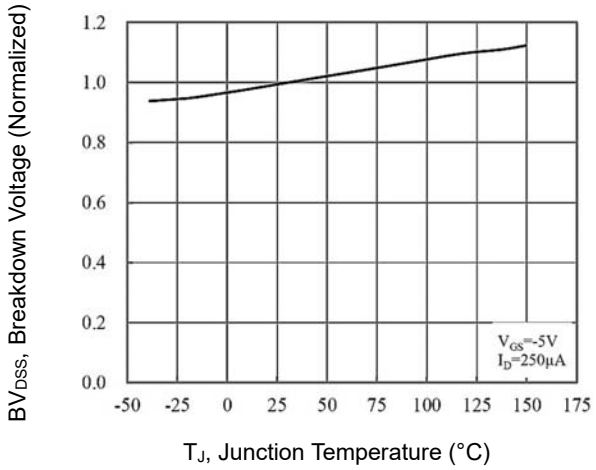


Normalized Gate Threshold Voltage



CHARACTERISTIC CURVES

Drain-Source Breakdown Voltage



Body Diode Forward Voltage