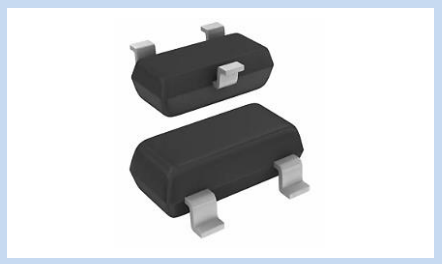
N-Channel MOSFET
30V 5.8A 1.4W SOT-23

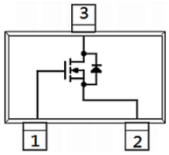
MFT3N5A8S23

MERITEK

FEATURE



- $R_{DS(ON)}$ <28mΩ, V_{GS}=10V
- $R_{DS(ON)}$ <33mΩ, V_{GS}=4.5V
- $R_{DS(ON)}$ <52mΩ, V_{GS}=2.5V
- Low On-Resistance
- Low Input/Output Leakage
- Application: Battery Charging, Power Management Functions, DC-DC Converters, Portable Power Adaptors



RoHS

MECHANICAL DATA

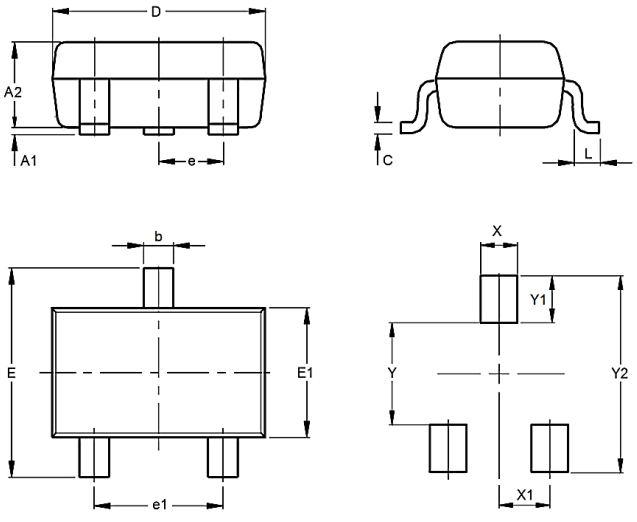
- Case: SOT-23 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

MAXIMUM RATINGS

Parameter, T_A=25°C		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±12	V
Drain Current – Continuous		I_D	5.8	A
Drain Current – Pulsed		I_{DM}	30	A
Power Dissipation	t ≤ 10s	P_D	1.4	W
Thermal Resistance, Junction to Ambient	t ≤ 10s	$R_{\theta JA}$	90	°C/W
	Steady State		125	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C

DIMENSIONS

Item	Min (mm)	Max (mm)
A1	--	0.10
A2	0.79	1.30
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	1.00	
Y1	1.00	
Y2	3.00	

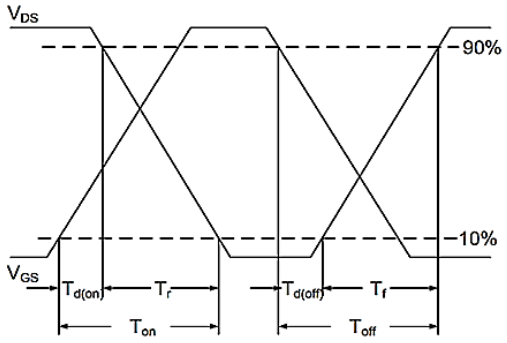


ELECTRICAL CHARACTERISTICS

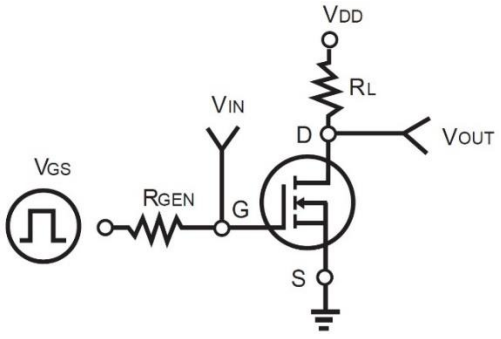
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	I_D=250 μA	BV_{DSS}	30	--	--	V
Drain-Source Leakage Current	V_{DS}=24V, V_{GS}=0V	I_{DSS}	--	--	1	μA
Gate-Source Leakage Current	V_{GS}=±12V, V_{DS}=0V	I_{GSS}	--	--	±0.1	μA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}=10V, I_D=5.8A	$R_{DS(ON)}$	--	--	28	mΩ
	V_{GS}=4.5V, I_D=5A		--	--	33	mΩ
	V_{GS}=2.5V, I_D=4A		--	--	52	mΩ
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	$V_{GS(th)}$	0.65	--	1.45	V
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Forward Transconductance	V_{DS}=5V, I_D=5A	g_{FS}	--	12	--	S
Gate Resistance	V_{DS}=0V, V_{GS}=0V, F=1MHz	R_g	--	5.9	--	Ω
Total Gate Charge	V_{DS}=15V, V_{GS}=4.5V, I_D=4.2A	Q_g	--	5.3	--	nC
	V_{DS}=15V, V_{GS}=10V, I_D=4.2A		--	11.5	--	
Gate-Source Charge	V_{DS}=15V, V_{GS}=10V, I_D=4.2A	Q_{gs}	--	1.4	--	
Gate-Drain Charge		Q_{gd}	--	1.6	--	
Turn-On Delay Time	V_{DS}=15V, V_{GS}=10V, R_G=1Ω, I_D=1A	$T_{d(on)}$	--	7.0	--	ns
Rise Time		T_r	--	3.6	--	
Turn-Off Delay Time		$T_{d(off)}$	--	12.0	--	
Fall Time		T_f	--	5.0	--	
Input Capacitance	V_{DS}=15V, V_{GS}=0V, F=1MHz	C_{iss}	--	505	--	pF
Output Capacitance		C_{oss}	--	61	--	
Reverse Transfer Capacitance		C_{rss}	--	50	--	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Continuous Forward Current	--	I_S	--	--	5.8	A
Diode Forward Voltage	V_{GS}=0V, I_S=1A	V_{SD}	--	--	1.0	V
Reverse Recovery Time	I_S=1.0A, di/dt=100A/μs	t_{rr}	--	7.4	--	ns
Reverse Recovery Charge		Q_{rr}	--	2.2	--	nC

Note:
1. Pulse width<100μs, Duty cycle<2%. Repetitive rating, pulse width limited by max junction temperature T_J
2. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air

Switching Time Waveform

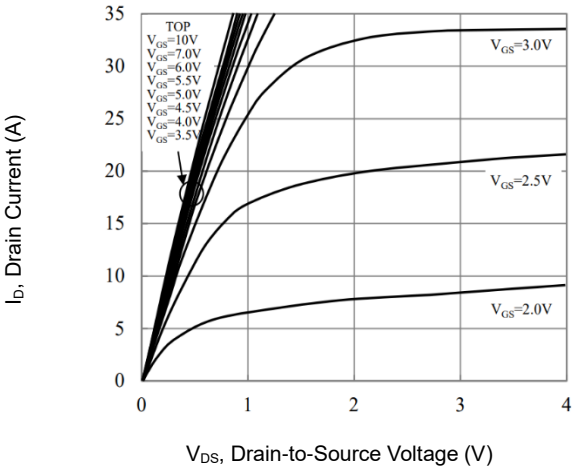


Switching Test Circuit

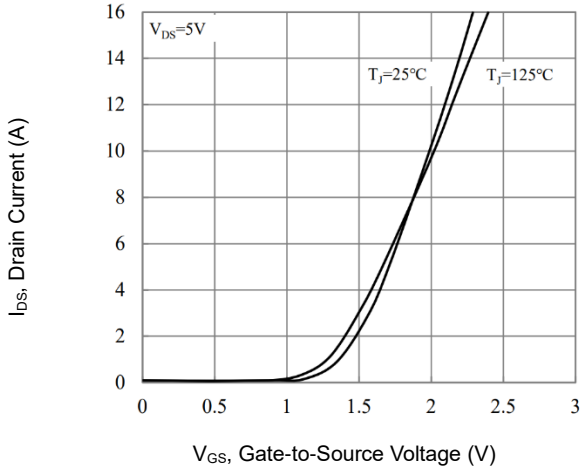


CHARACTERISTIC CURVES

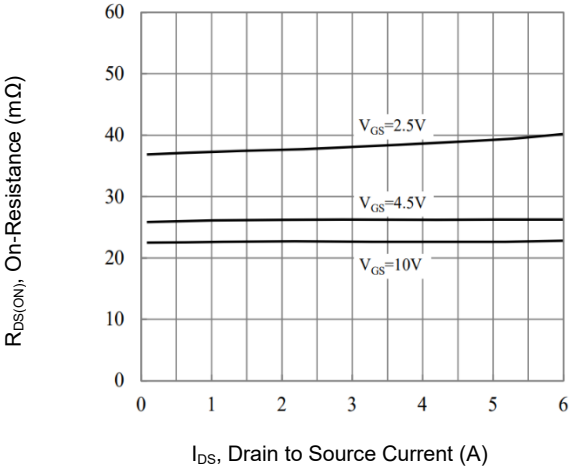
On Region Characteristics



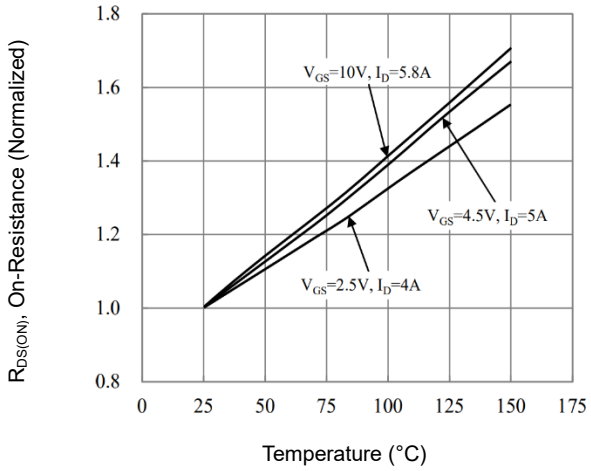
Transfer Characteristics



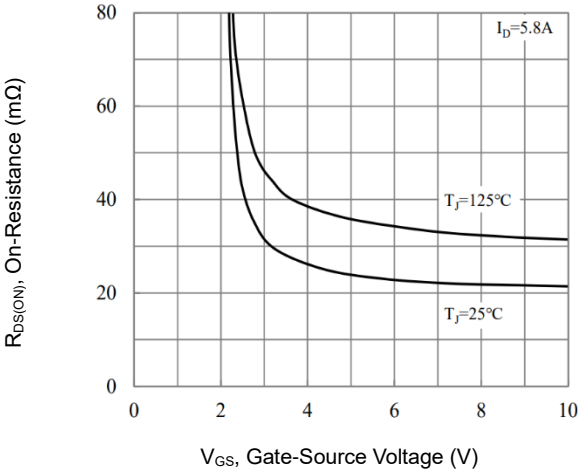
On-Resistance vs. Drain Current



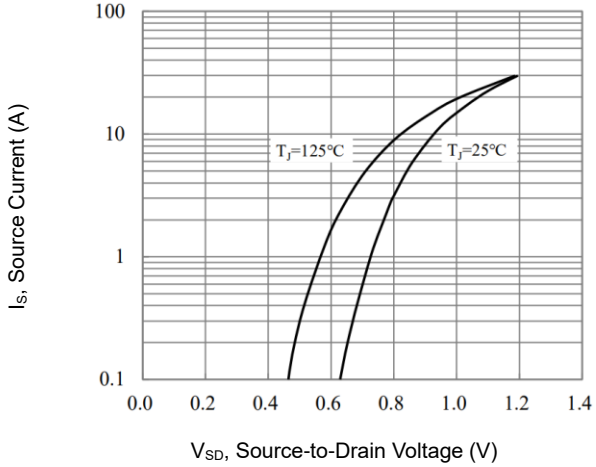
On-Resistance vs. Junction Temperature



On-Resistance Variation with V_{GS}

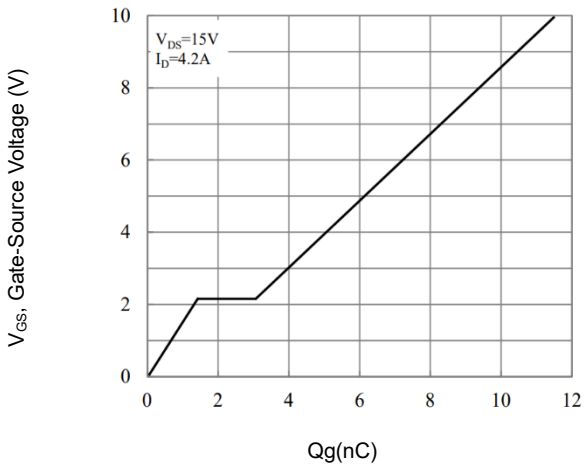


Body Diode Characteristics

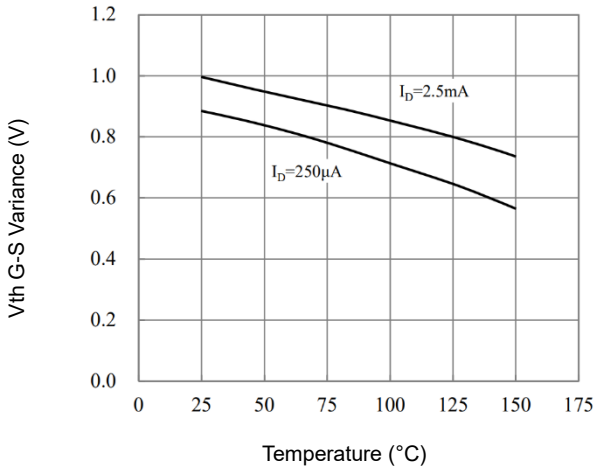


CHARACTERISTIC CURVES

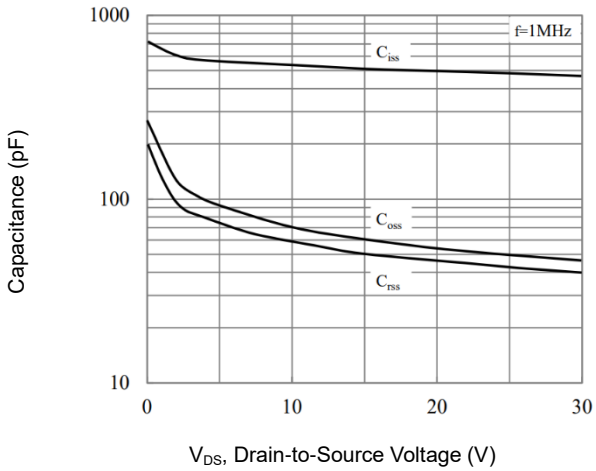
Gate Charge Characteristics



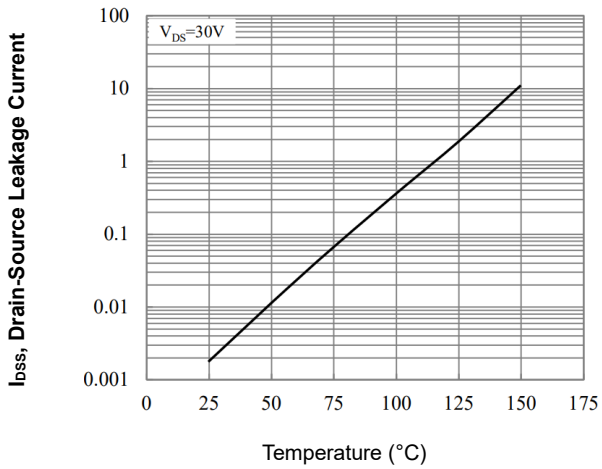
Threshold Voltage Variance vs. Temperature



Capacitance vs. Drain-Source Voltage



Drain-Source Leakage Current vs Temperature



Drain-Source Breakdown Voltage vs Temperature