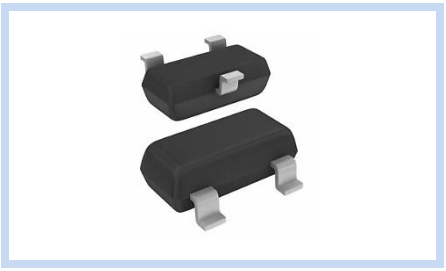
P-Channel MOSFET
30V 4A SOT-23

MFT3P4A0S23

MERITEK

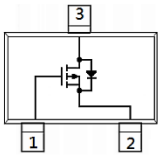
FEATURE



- $R_{DS(ON)}$<54mΩ at V_{GS}=-10V
- $R_{DS(ON)}$<72mΩ at V_{GS}=-4.5V
- $R_{DS(ON)}$<120mΩ at V_{GS}=-2.5V
- Low $R_{DS(ON)}$ Trench Technology
- Application: Load Switch, DC-DC Conversion, Battery Management and Protection

MECHANICAL DATA

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



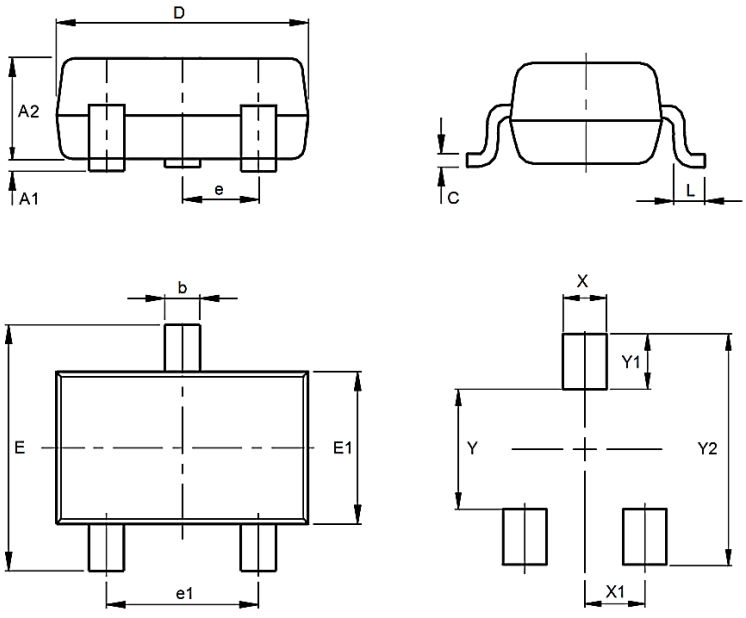
RoHS

MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current – Continuous	I_D	-4	A
Drain Current – Pulsed	I_{DM}	-27	A
Power Dissipation	P_D	1.4	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	90	°C/W
Operating Junction and Storage Temperature	T_J, T_{stg}	-55 to 150	°C

DIMENSIONS

Item	Min (mm)	Max (mm)
A1	0.00	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	

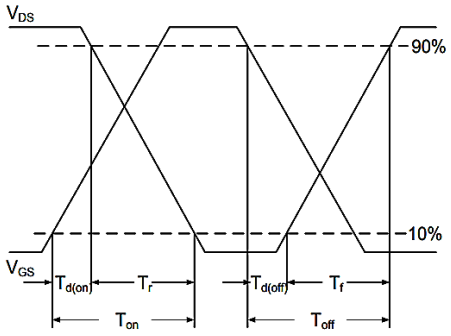


ELECTRICAL CHARACTERISTICS

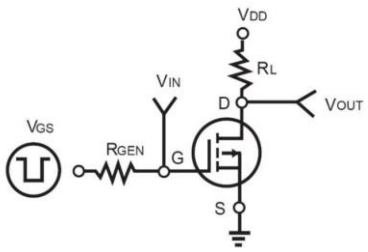
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	BV_{DSS}	-30	--	--	V
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=-250μA	$V_{GS(th)}$	-0.7	--	-1.3	V
Gate Leakage Current	V_{DS}=0V, V_{GS}=±12V	I_{GSS}	--	--	±0.1	μA
Zero Gate Voltage Drain Current	V_{DS}=-30V, 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=-4A	$R_{DS(ON)}$	--	--	54	mΩ
	V_{GS}=-4.5V, I_D=-3.7A		--	--	72	
	V_{GS}=-2.5V, I_D=-2A		--	--	120	
Forward Transfer Admittance	V_{DS}=-5V, I_D=-3A	g_{FS}	--	8.6	--	S
Dynamic Characteristics	**Conditions**	**Symbol**	**--**	**Typ.**	**Max**	**Unit**
Input Capacitance	V_{DS}=-15V, V_{GS}=0V, F=1.0MHz	C_{iss}	--	454	--	pF
Output Capacitance		C_{oss}	--	68	--	
Reverse Transfer Capacitance		C_{rss}	--	64	--	
Turn-On Delay Time	V_{DS}=-15V, I_D=-3A, V_{GS}=-4.5V, R_G=3.3Ω	$T_{d(on)}$	--	11.0	--	nS
Rise Time		T_r	--	28.0	--	
Turn-Off Delay Time		$T_{d(off)}$	--	20.0	--	
Fall Time		T_f	--	6.0	--	
Total Gate Charge	V_{DS}=-15V, V_{GS}=-2.5V, I_D=-3A	Q_g	--	4.0	--	nC
	V_{DS}=-15V, V_{GS}=-4.5V, I_D=-3A		--	6.6	--	
Gate-Source Charge	V_{DS}=-15V, V_{GS}=-4.5V, I_D=-3A	Q_{gs}	--	1.0	--	
Gate-Drain Charge		Q_{gd}	--	2.4	--	
Gate resistance	V_{DS}=0V, V_{GS}=0V, F=1.0MHz	R_g	--	10.9	--	Ω
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Forward Voltage	I_S=-4A,V_{GS}=0V	V_{SD}	--	--	-1.3	V
Diode Continuous Forward Current	--	I_S	--	--	-4	A
Reverse Recovery Time	I_S=-3A, di/dt=100A/μs	t_{rr}	--	8	--	nS
Reverse Recovery Charge		Q_{rr}	--	3.4	--	nC

Note:
1. T_A = 25°C unless otherwise noted.
2. Pulse width≤100μs, Duty cycle≤2%. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C
3. Device mounted on FR-4 substrate PC board, 2oz copper, with a 1-inch^2 copper plate in still air.

Switching Time Waveform

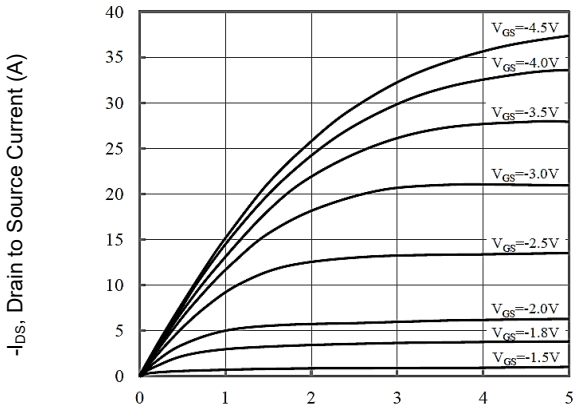


Switching Test Circuit

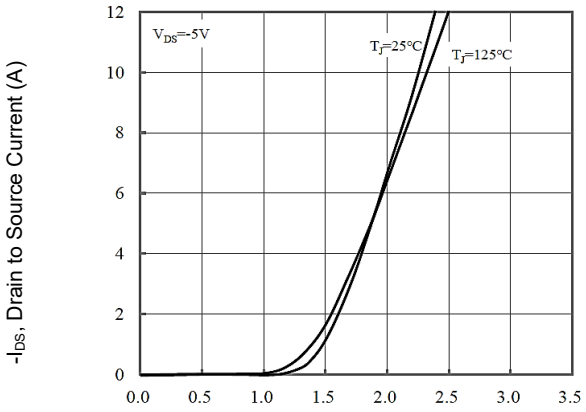


CHARACTERISTIC CURVES

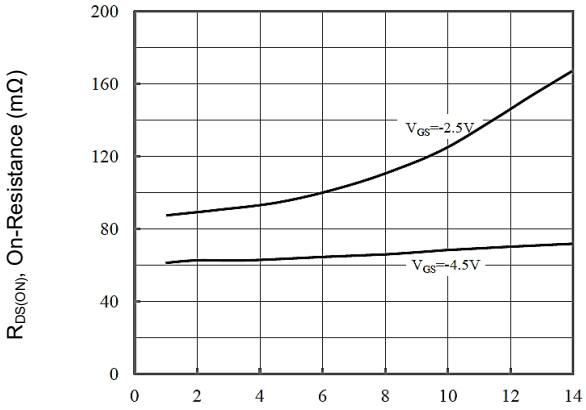
On Region Characteristics



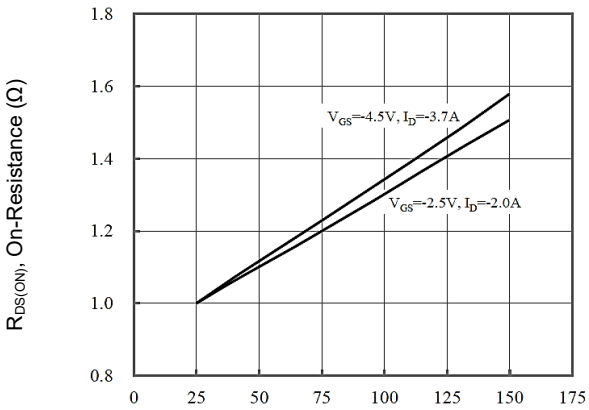
Transfer Characteristics



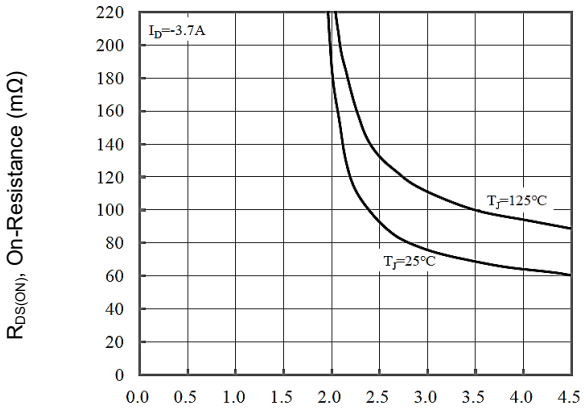
On-Resistance vs. Drain Current



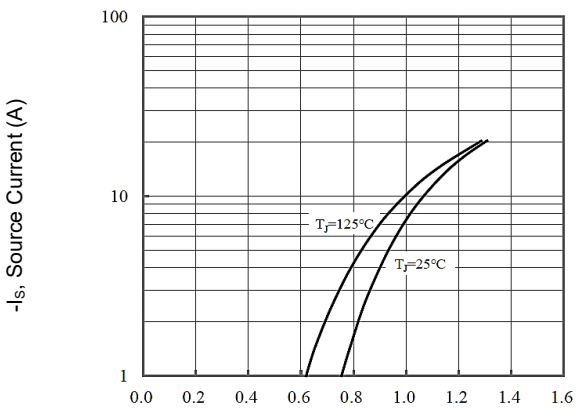
On-Resistance vs. Junction Temperature



On-Resistance Variation with V_{GS}

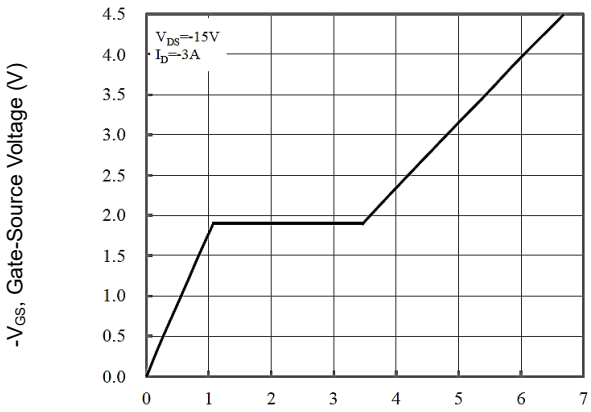


Body Diode Characteristics

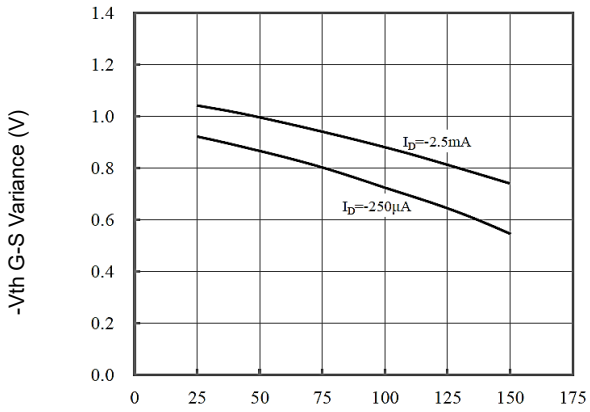


CHARACTERISTIC CURVES

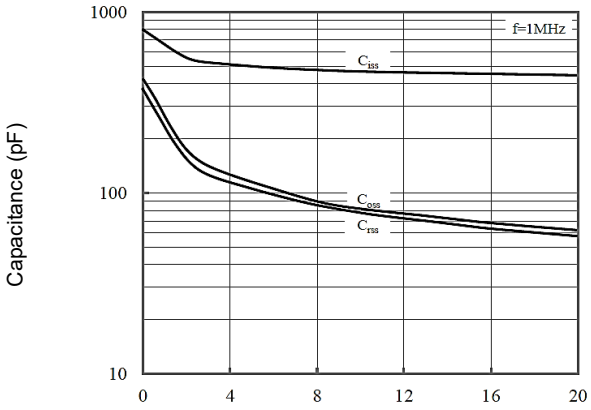
Gate Charge Characteristics



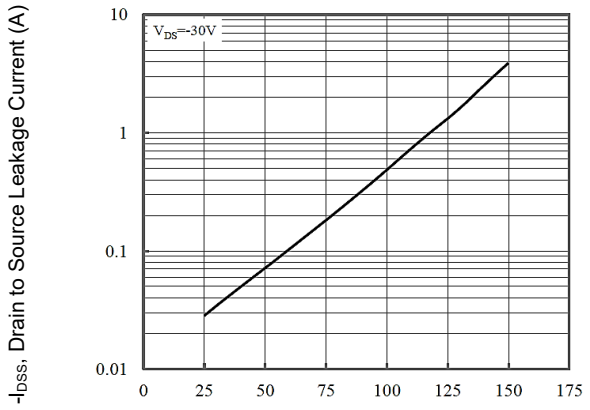
Threshold Voltage Variance vs. Temperature



Capacitance vs. Drain-Source Voltage



Drain to Source Leakage Current vs. Temperature



Breakdown Voltage vs. Temperature