N-Channel MOSFET
60V 0.5A SOT-23 ESD

MFT6NA5S23E

MERITEK

FEATURE

- Operating temperature: -55 ~ 150 °C
- High dense cell design for extremely low RDS(ON)
- Rugged and reliable
- Trench Technology

RoHS

MAXIMUM RATINGS

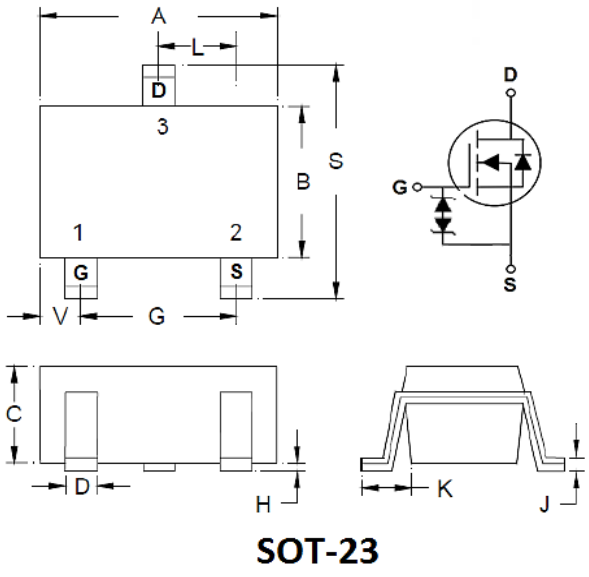
Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current – Continuous (T_J=150°C)	T_A=25°C	I_D	0.5	A
Drain Current – Continuous (T_J=150°C)	T_A=70°C	I_D	0.3	A
Drain Current – Pulsed		I_{DM}	0.65	A
Power Dissipation	T_A=25°C	P_D	1.25	W
Power Dissipation	T_A=70°C	P_D	0.8	W
Operating Junction Temperature and Storage Temperature Range		T_J ,T_{stg}	-55 to 150	°C

Thermal RATINGS

Parameter	Symbol	Value	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	120	°C / W

DIMENSIONS

Item	Min (mm)	Max (mm)
A	2.8	3.00
B	1.20	1.40
C	0.90	1.20
D	0.30	0.50
G	1.80	2.0
H	0.00	0.10
J	0.08	0.15
K	0.550 REF	
L	0.95 BSC	
S	2.25	2.55
V	0.41	0.61



SOT-23

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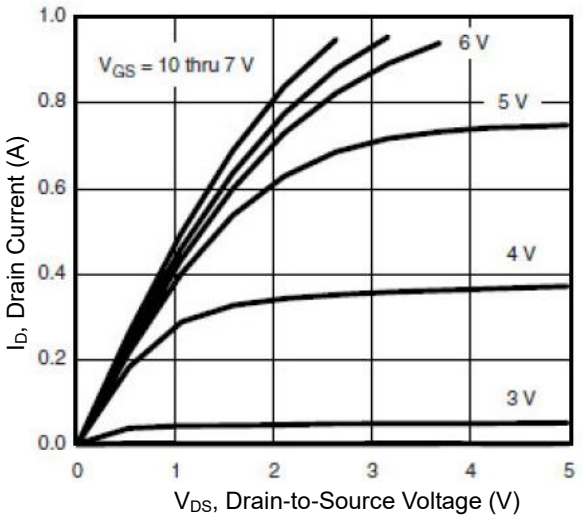
ELECTRICAL CHARACTERISTICS

Static Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= 250uA	BV_{DSS}	60	--	--	V
Gate Leakage Current	V_{DS}=0V, V_{GS}=±20V	I_{GSS}	--	--	3	nA
Zero Gate Voltage Drain Current	V_{DS}= 60V, V_{GS}=0V	I_{DSS}	--	--	1	μA
Zero Gate Voltage Drain Current	V_{DS}= 60V, V_{GS}=0V, T_J=85°C	I_{DSS}	--	--	10	μA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D= 250uA	$V_{GS(th)}$	1.0	--	2.0	V
Static Drain-Source On-Resistance	V_{GS}=10V, I_D= 0.5A	$R_{DS(ON)}$	--	1.2	2.4	Ω
	V_{GS}= 4.5V, I_D= 0.3A		--	1.6	3.0	
Forward Trans conductance	V_{DS}= 10V, I_D= 0.2A	g_{FS}	--	0.2	--	S
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Input Capacitance	V_{DS}= 25V, V_{GS}=0V F=1.0MHz	C_{iss}	--	30	--	pF
Output Capacitance		C_{oss}	--	8	--	
Reverse Transfer Capacitance		C_{rss}	--	5	--	
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Turn-On Delay Time	V_{DD} = 30V, I_D = 0.2A, V_{GS} = -4.5V, R_G = 10Ω, R_L=150 Ω	$T_{d(on)}$	--	10	20	nS
Rise Time		T_r	--	35	50	
Turn-Off Delay Time		$T_{d(off)}$	--	20	30	
Fall Time		T_f	--	40	60	
Total Gate Charge	V_{DS}= 10V, V_{GS}= 4.5V, I_D= 0.25A	Q_g	--	500	--	pC
Gate-Source Charge		Q_{gs}	--	100	--	
Gate-Drain Charge		Q_{gd}	--	150	--	
Drain-Source Diode Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Forward Voltage	I_S=0.2A,V_{GS}=0V	V_{SD}	--	0.75	1.4	V

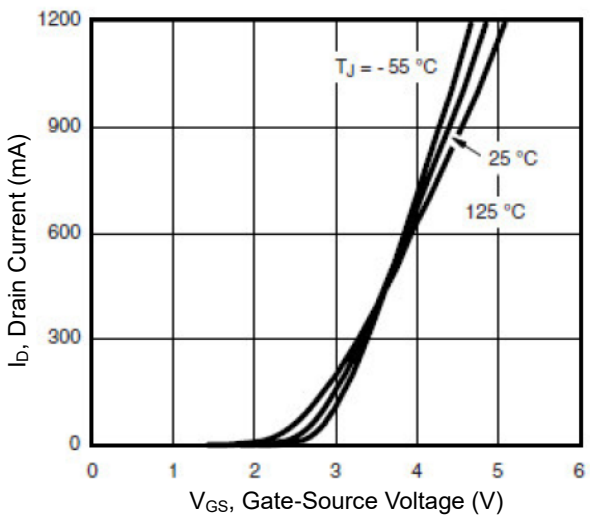
Note:
1. TA = 25 C unless otherwise noted

CHARACTERISTIC CURVES

Output Characteristics

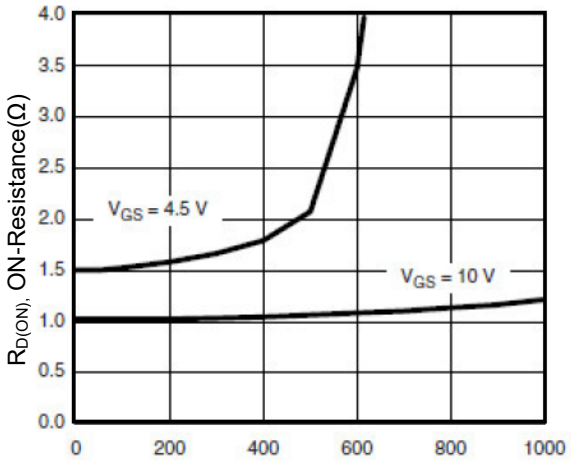


Transfer Characteristics

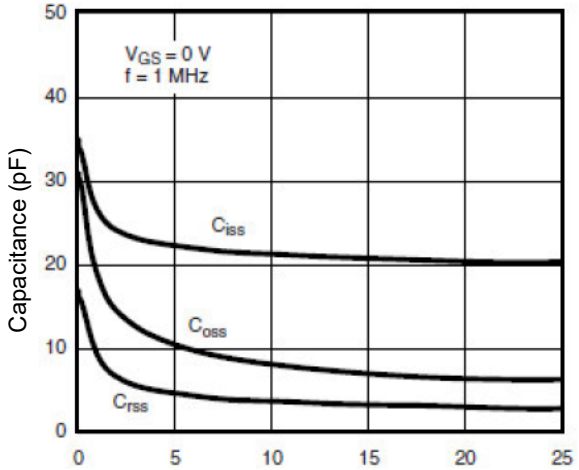


CHARACTERISTIC CURVES

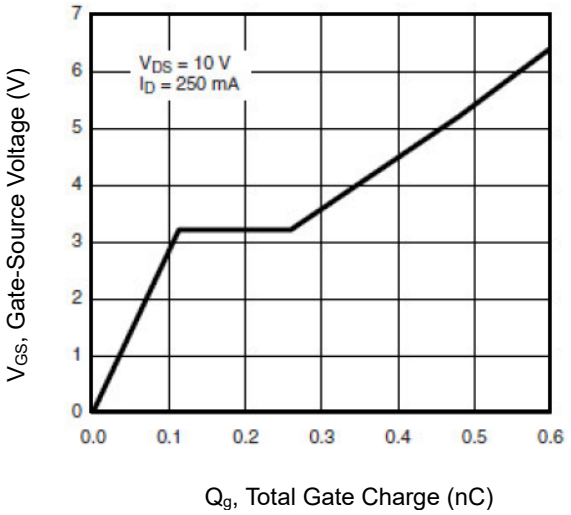
On-Resistance vs. Drain Current



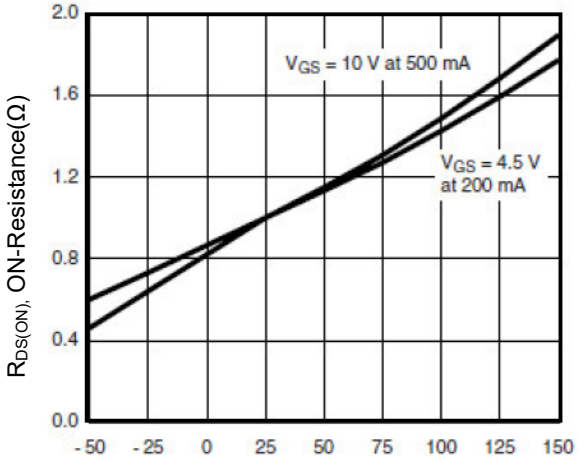
Capacitance



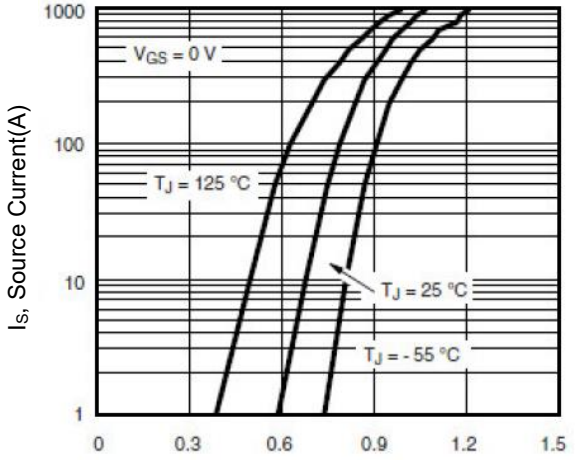
Gate Charge



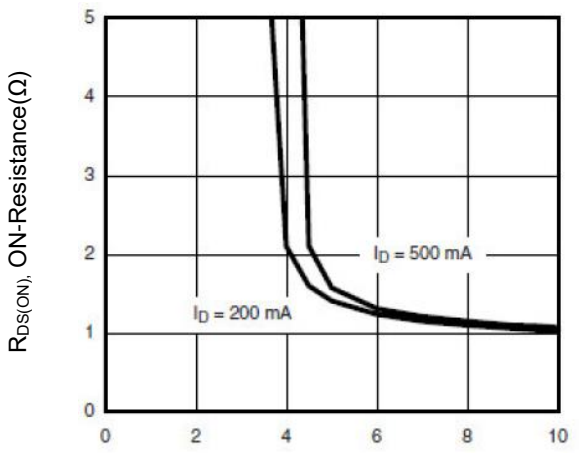
On-Resistance vs. Junction Temperature



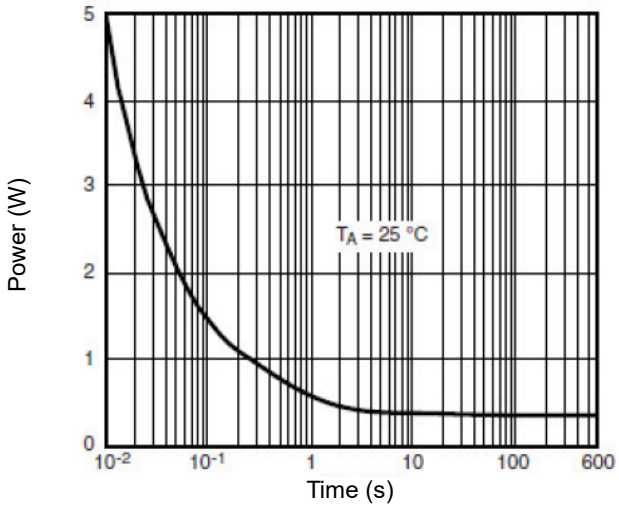
Source-Drain Diode Forward Voltage



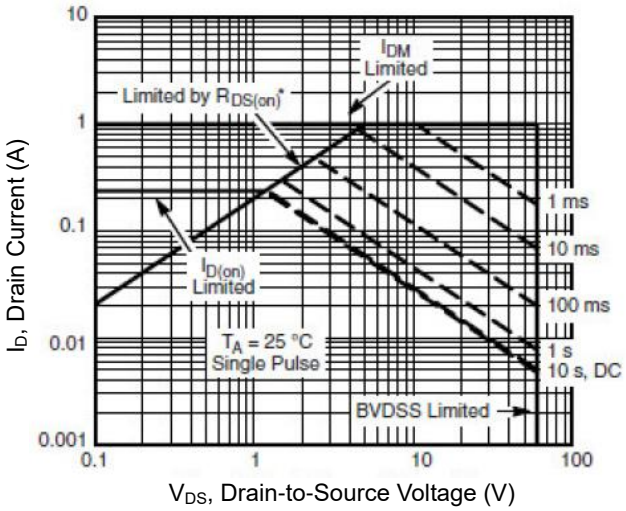
On-Resistance vs. Gate-to-Source Voltage



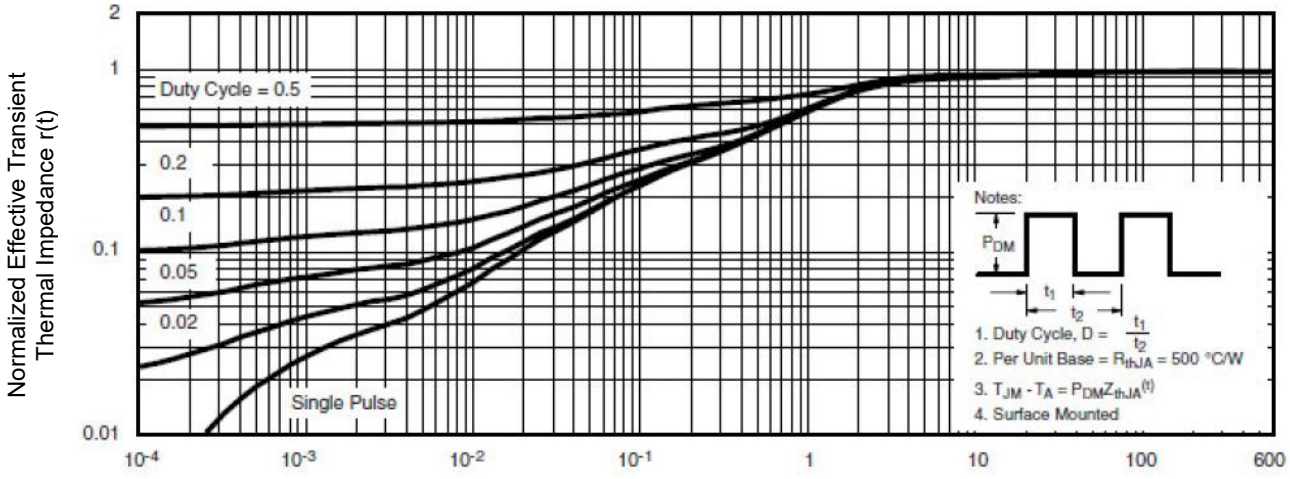
Single Pulse Power



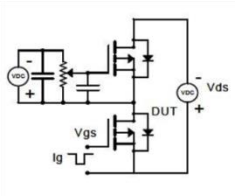
Safe Operating Area

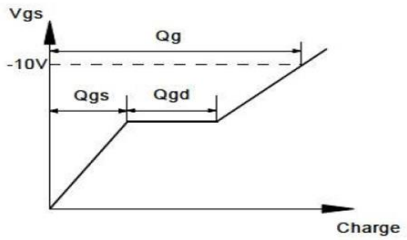


Normalized Thermal Transient Impedance Curve

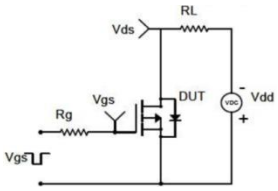


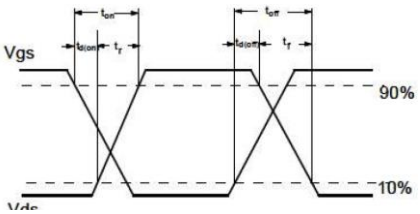
Gate Charge Test Circuit & Waveform





Resistive Switching Test Circuit & Waveform





*Specifications subject to change without notice.