

N-Channel MOSFET

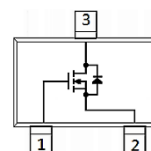
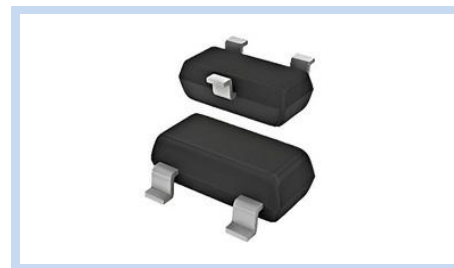
60V 4.5A 2.5W SOT-23

MFT6N4A5S23

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FEATURE

- $R_{DS(ON)}=40m\Omega$ at $V_{GS}=10V$
- $R_{DS(ON)}=45m\Omega$ at $V_{GS}=4.5V$
- Very Low $R_{DS(ON)}$
- Fast Switching Speed, High Effective
- Application: Load Switch for Portable Devices, DC/DC Converter



MECHANICAL DATA

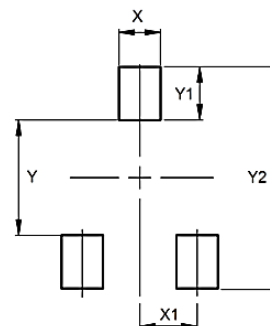
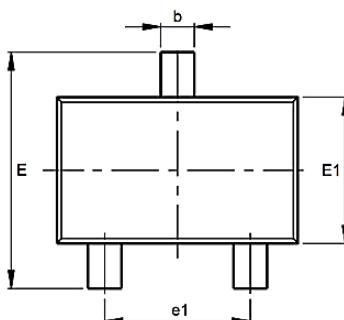
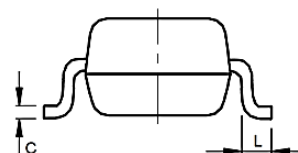
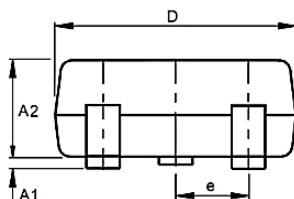
- Case: SOT-23 Package, Molding Epoxy
- Terminals: Solderable per MIL-STD-750, Method 2026

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	4.5	A
Drain Current – Pulsed	I_{DM}	18	A
Power Dissipation	P_D	2.5	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	50	$^{\circ}C / W$
Operating Junction Temperature	T_J	150	$^{\circ}C$
Storage Temperature Range	T_{stg}	-55 to 150	$^{\circ}C$

DIMENSIONS

Item	Min (mm)	Max (mm)
A1	0.00	0.10
A2	1.05	1.15
b	0.30	0.50
c	0.10	0.20
D	2.82	3.02
e	0.95 TYP	
e1	1.80	2.00
E	2.65	2.95
E1	1.50	1.70
L	0.30	0.60
X	0.80	
X1	0.95	
Y	1.40	
Y1	1.00	
Y2	3.40	



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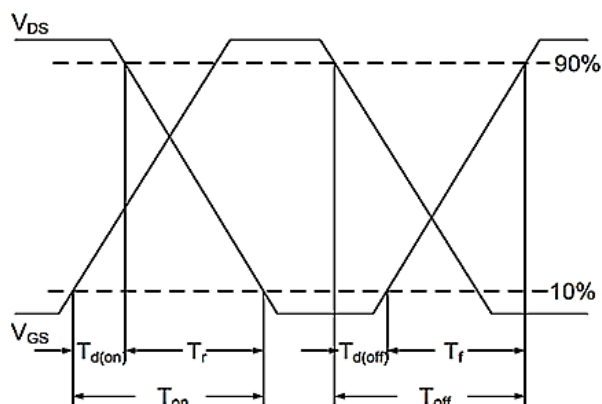
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	60	--	--	V
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	1.2	1.6	2.5	V
Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	I_{GSS}	--	--	± 100	nA
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	$V_{GS}=10V, I_D=5.6A$	$R_{DS(on)}$	--	30	40	m Ω
	$V_{GS}=4.5V, I_D=5.0A$		--	35	45	
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=10V, V_{DS}=30V, I_D \approx 4.5A$	Q_g	--	12	--	nC
Gate-Source Charge		Q_{gs}	--	1.6	--	
Gate-Drain Charge		Q_{gd}	--	2.5	--	
Input Capacitance	$V_{DS}=15V, V_{GS}=0V, F=1.0MHz$	C_{iss}	--	590	--	pF
Output Capacitance		C_{oss}	--	70	--	
Reverse Transfer Capacitance		C_{rss}	--	64	--	
Turn-On Delay Time	$V_{DD}=30V, I_D \approx 2A, V_{GS}=10V, R_G=3\Omega$	$T_{d(on)}$	--	10.5	--	nS
Rise Time		T_r	--	4.5	--	
Turn-Off Delay Time		$T_{d(off)}$	--	22	--	
Fall Time		T_f	--	4.3	--	
Gate Resistance	$F=1.0MHz$	R_g	--	3.5	--	Ω
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Current	-	I_S	--	--	4.5	A
Diode Forward Voltage	$I_S=1A, V_{GS}=0V, T_J=25^\circ C$	V_{SD}	--	--	1.2	V

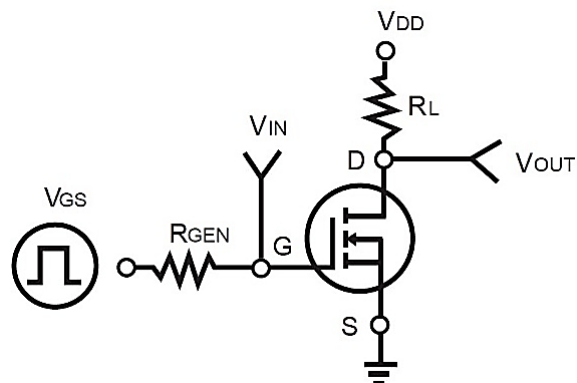
Note:

1. $T_J = 25^\circ C$, unless otherwise noted.

Switching Time Waveform



Switching Test Circuit



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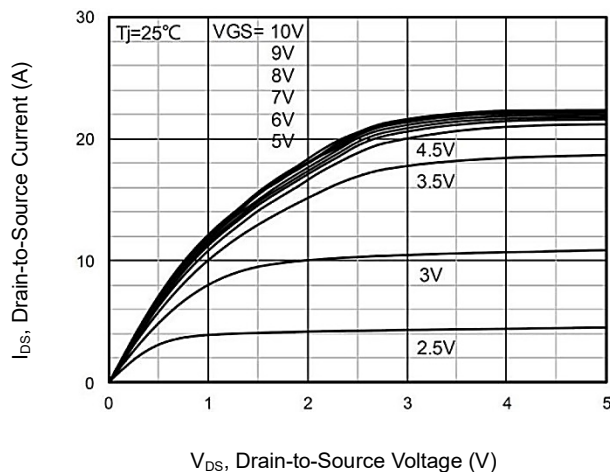
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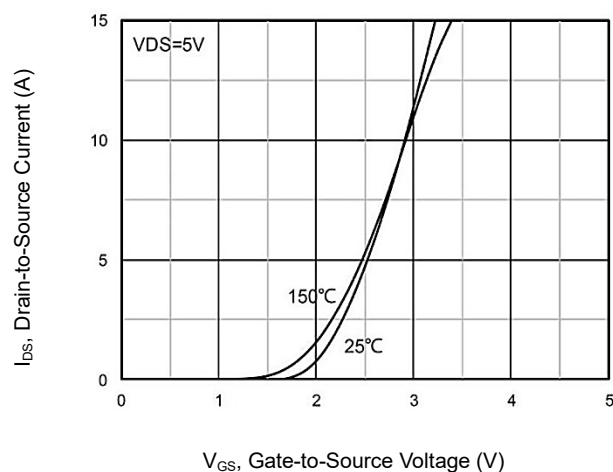
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CHARACTERISTIC CURVES

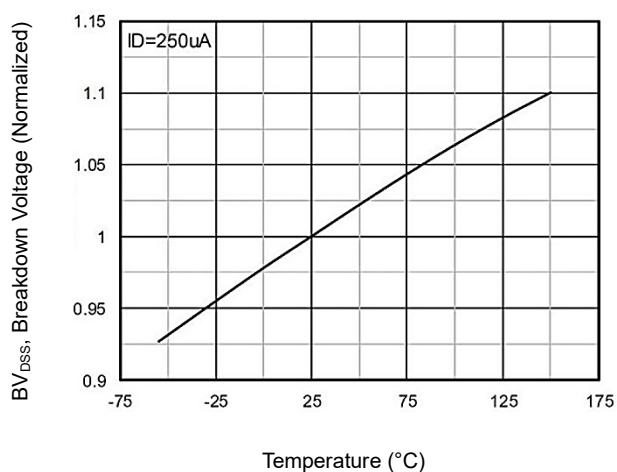
Output Characteristics



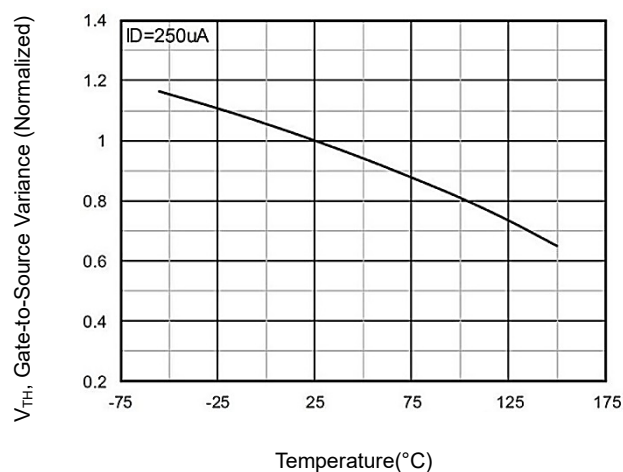
Transfer Characteristics



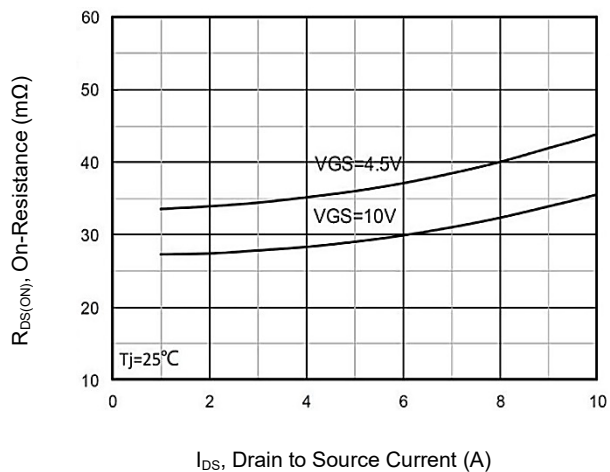
Breakdown Voltage vs. Temperature



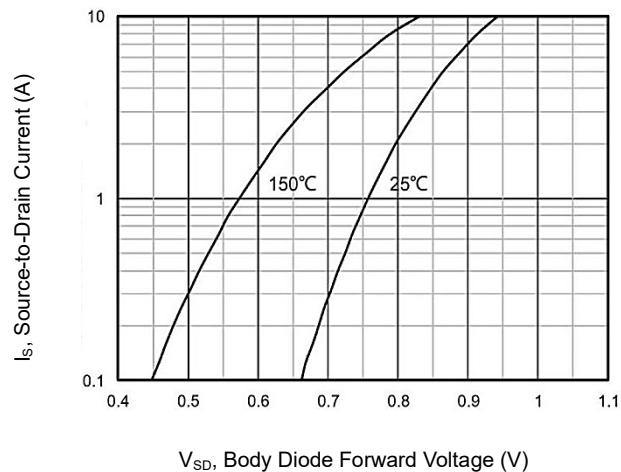
Threshold Voltage Variation with Temperature



On-Resistance vs. Drain Current



Body Diode Forward Voltage



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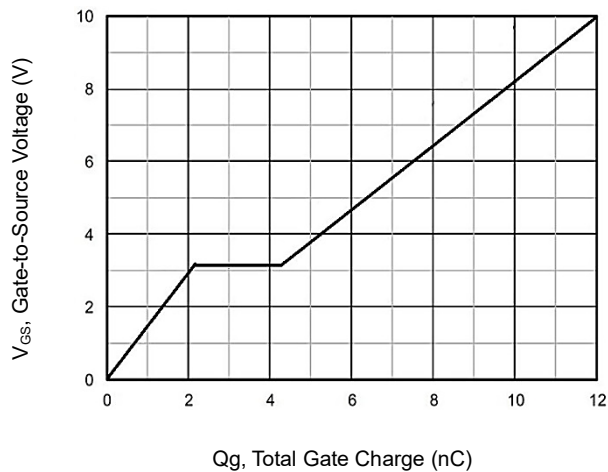
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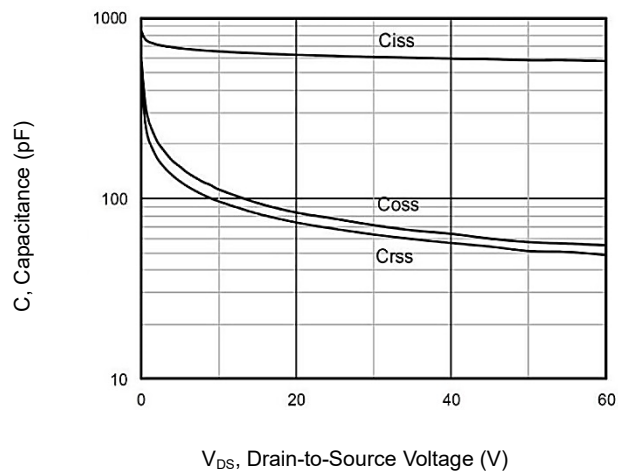
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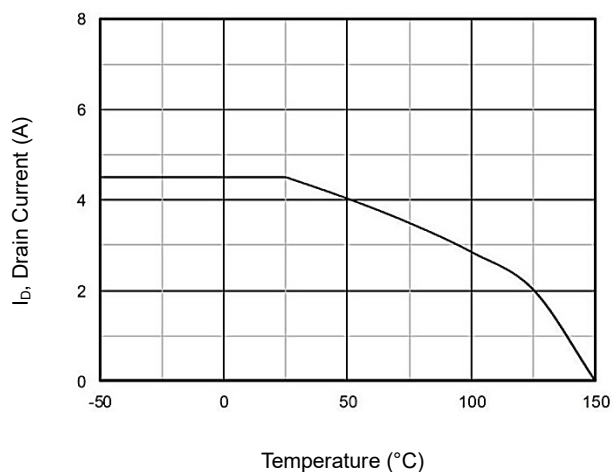
Gate Charge



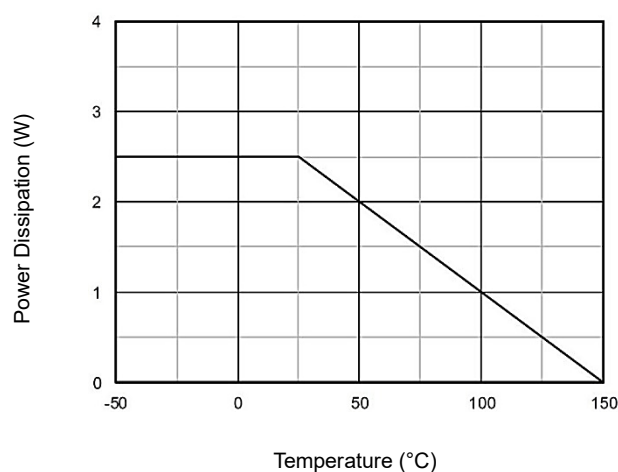
Capacitance



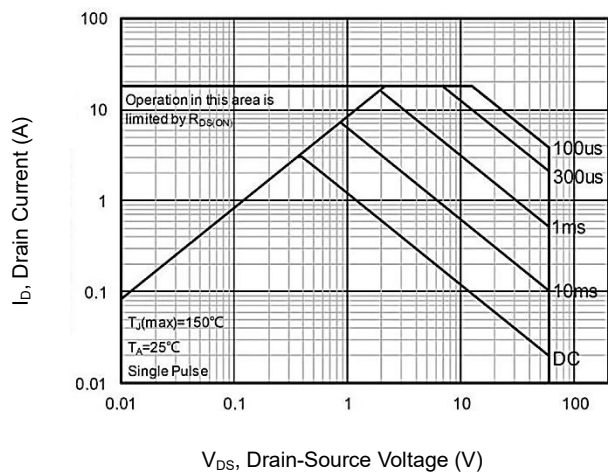
Current Dissipation



Power Dissipation



Maximum Safe Operating Area



Maximum Transient Thermal Impedance

