

N-Channel MOSFET

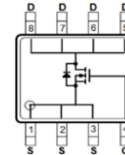
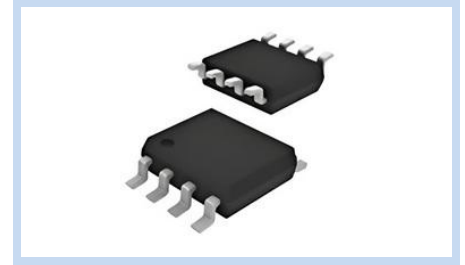
100V 12A 3.5W SOP-8

MFT10N12S8

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FEATURE

- $R_{DS(ON)} < 13m\Omega$, $V_{GS}=10V$, $I_D=12A$
- $R_{DS(ON)} < 15m\Omega$, $V_{GS}=4.5V$, $I_D=12A$
- High Density Cell Design for Low $R_d(Son)$
- Application: DC/DC Converter, High-Frequency Switching and Synchronous Rectification

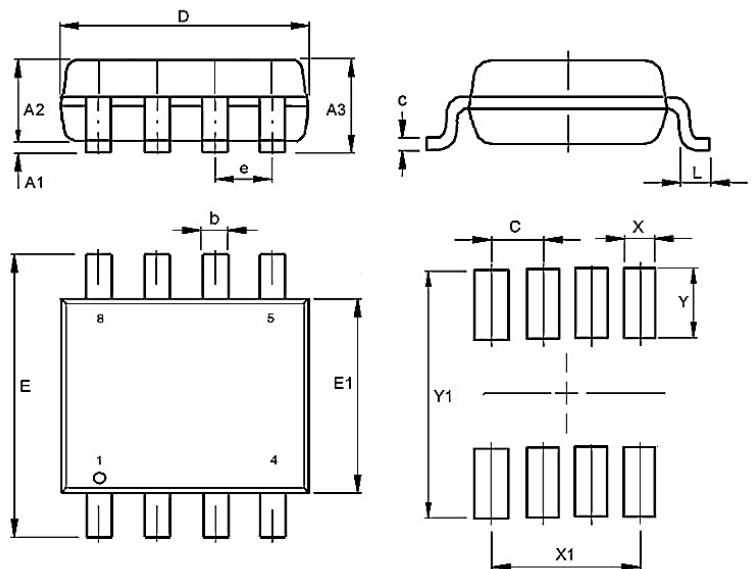


MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current – Continuous	I_D	12	A
Drain Current – Pulsed	I_{DM}	48	A
Power Dissipation	P_D	3.5	W
Single Pulse Avalanche Energy	E_{AS}	152	mJ
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	36	$^{\circ}C/W$
Operating Junction and Storage Temperature	T_J, T_{STG}	-55 to +150	$^{\circ}C$

DIMENSIONS

Item	Min. (mm)	Max. (mm)
A1	0.10	0.25
A2	1.35	1.55
A3	1.35	1.75
b	0.33	0.51
c	0.17	0.25
D	4.70	5.10
E	5.80	6.20
E1	3.80	4.00
e	1.27	
L	0.40	1.27
X	0.60	
X1	3.81	
Y	1.52	
Y1	7.00	
C	1.27	



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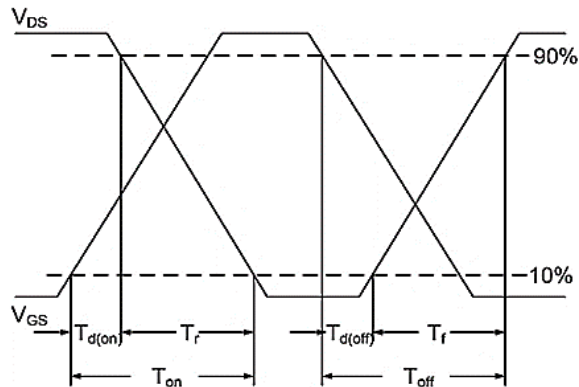
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	100	--	--	V
Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V$	I_{DSS}	--	--	1	μA
Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	--	--	± 100	nA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=12A$	$R_{DS(ON)}$	--	10.0	13	m Ω
	$V_{GS}=4.5V, I_D=12A$		--	11.5	15	
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	1.0	--	3.0	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=50V, V_{GS}=10V, I_D=10A$	Q_g	--	32	--	nC
Gate-Source Charge		Q_{gs}	--	11.1	--	
Gate-Drain Charge		Q_{gd}	--	4.78	--	
Turn-On Delay Time	$V_{DD}=50V, V_{GS}=10V, R_{GEN}=2.2\Omega, I_D=10A$	$T_{d(on)}$	--	51	--	nS
Rise Time		T_r	--	14.4	--	
Turn-Off Delay Time		$T_{d(off)}$	--	69.2	--	
Fall Time		T_f	--	20.6	--	
Input Capacitance	$V_{DS}=50V, V_{GS}=0V, f=1MHz$	C_{iss}	--	2270	--	pF
Output Capacitance		C_{oss}	--	797	--	
Reverse Transfer Capacitance		C_{rss}	--	36	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Current	--	I_S	--	--	12	A
Diode Forward Voltage	$V_{GS}=0V, I_S=12A$	V_{SD}	--	--	1.2	V
Reverse Recovery Time	$T_J=25^\circ C, I_F=10A, di/dt=100A/\mu s$	t_{rr}	--	51.5	--	nS
Reverse Recovery Charge		Q_{rr}	--	84	--	nC

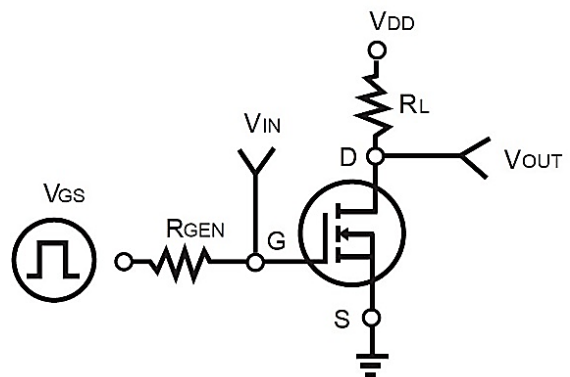
Note:

1. Pulse test: Pulse width $<300\mu s$, Duty cycle $\leq 2\%$.
2. Guaranteed by design, not subject to production testing.

Switching Time Waveform



Switching Test Circuit



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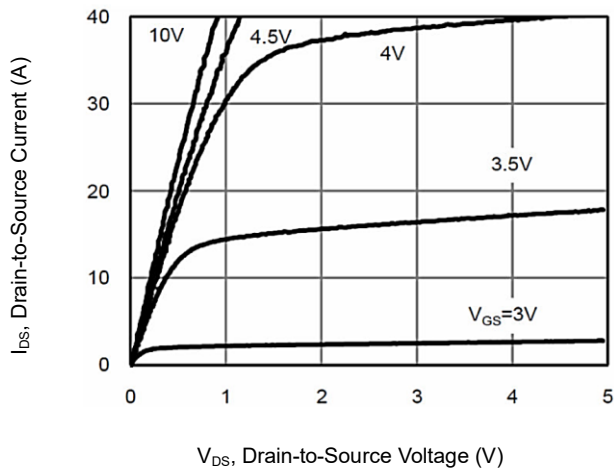
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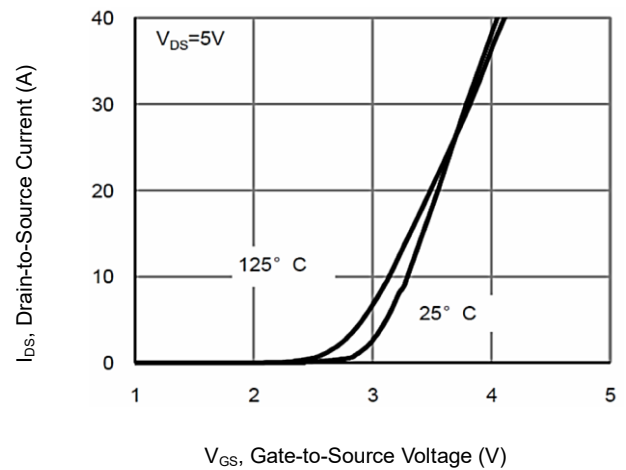
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CHARACTERISTIC CURVES

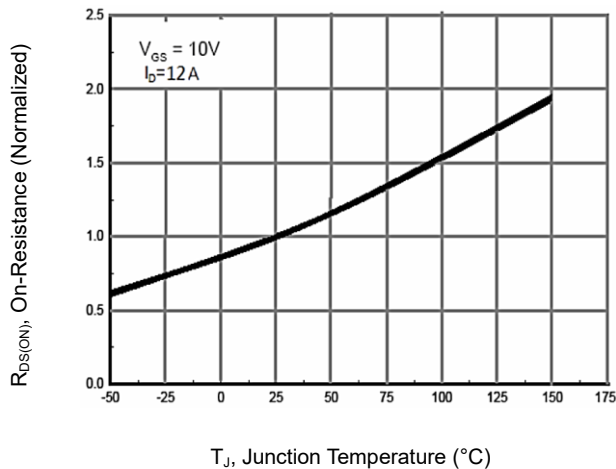
Output Characteristics



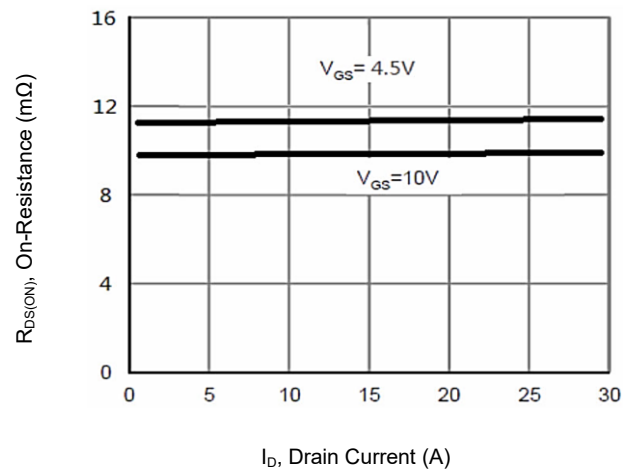
Transfer Characteristics



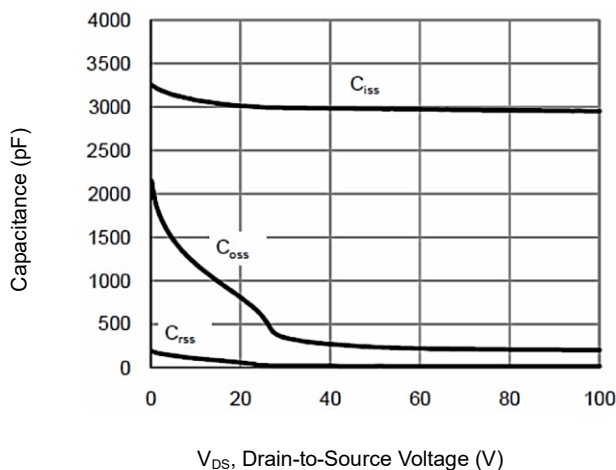
On-Resistance vs. Junction Temperature



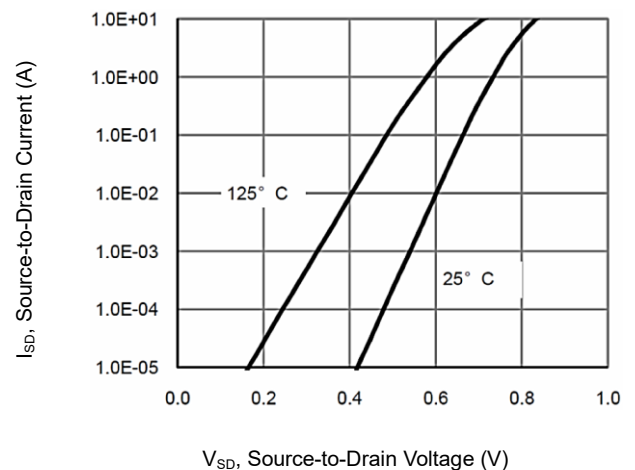
On-Resistance vs. Drain Current



Capacitance



Body Diode Characteristics



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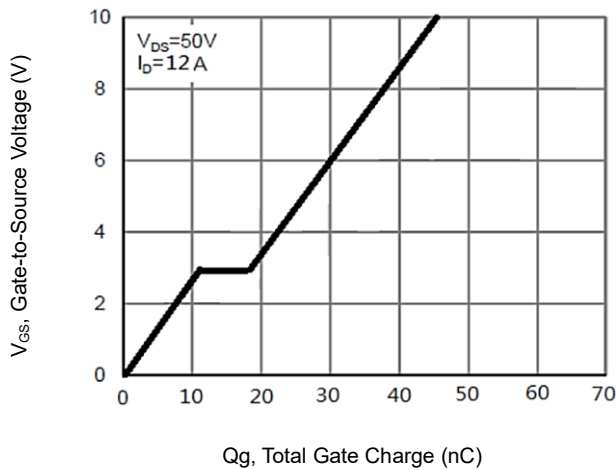
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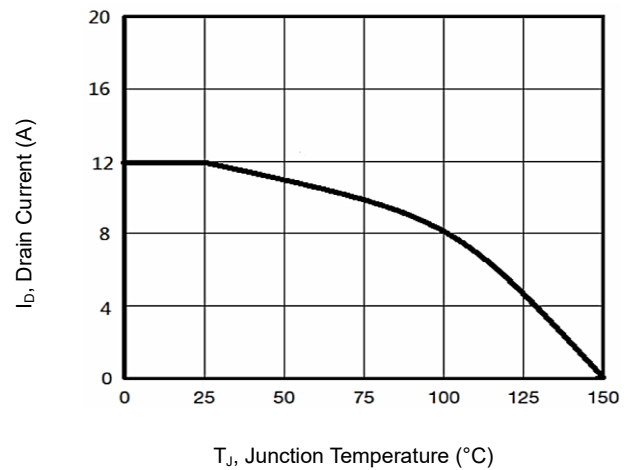
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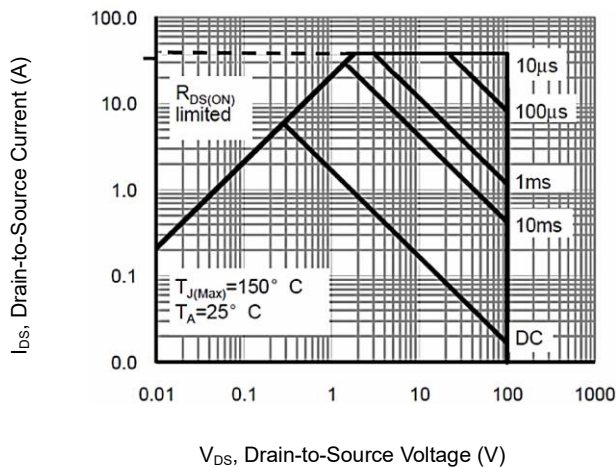
Gate Charge Characteristics



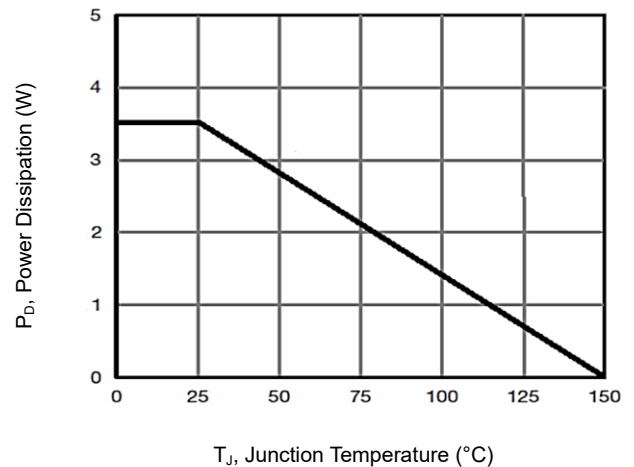
Current Derating Curve



Maximum Safe Operating Area



Power Derating Curve



Normalized Maximum Transient Thermal Impedance

