

N-Channel MOSFET

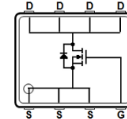
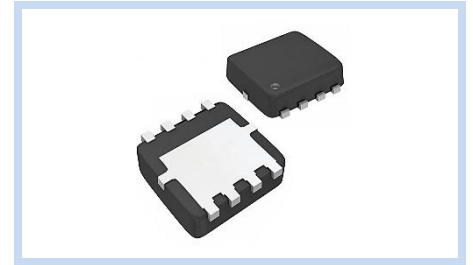
40V 30A DFN3x3 AEC-Q101

MFT4N30D33A

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FEATURE

- $R_{DS(ON)} < 12m\Omega$, $V_{GS}=10V$, $I_D=15A$
- $R_{DS(ON)} < 17m\Omega$, $V_{GS}=4.5V$, $I_D=10A$
- High Density Cell Design for Low $R_{d(Son)}$
- Application: DC/DC Converter, High-Frequency Switching and Synchronous Rectification
- AEC-Q101 Qualified

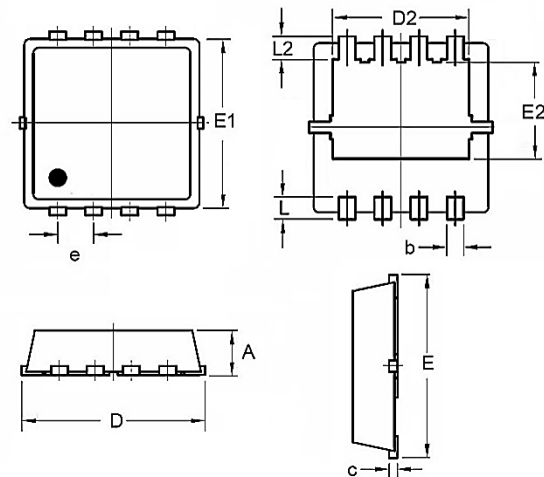


MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current – Continuous	$T_C = 25^\circ C$	I_D	30	A
	$T_C = 100^\circ C$		19	
Drain Current – Pulsed	$T_C = 25^\circ C$, $t_p=100\mu s$	I_{DM}	110	A
Power Dissipation	$T_C = 25^\circ C$	P_D	34	W
Single Pulsed Avalanche Energy		E_{AS}	40.96	mJ
Thermal Resistance, Junction to Case		$R_{\theta JC}$	3.6	$^\circ C/W$
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 to +150	$^\circ C$

DIMENSIONS

Item	Min. (mm)	Max. (mm)
A	0.70	0.90
b	0.20	0.40
c	0.10	0.25
D	3.15	3.45
D2	2.25	2.65
e	0.65 (BSC)	
E	3.15	3.45
E1	2.90	3.20
E2	1.32	1.72
L	0.30	0.50
L2	0.28	0.65



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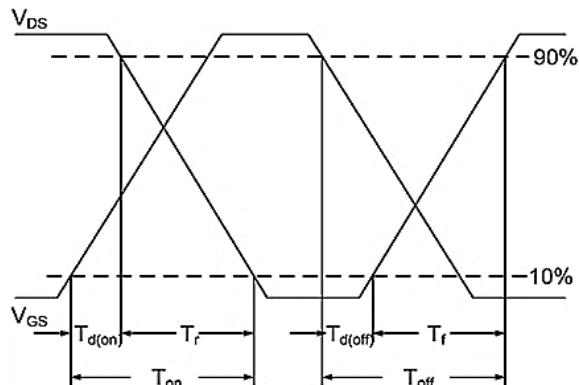
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	40	--	--	V
Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V$	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	$V_{GS}=10V, I_D=15A$	$R_{DS(ON)}$	--	9	12	m Ω
	$V_{GS}=4.5V, I_D=10A$		--	12.5	17	
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	1.0	1.5	2.0	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=20V, V_{GS}=10V, I_D=15A$	Q_g	--	21.4	--	nC
Gate-Source Charge		Q_{gs}	--	3.1	--	
Gate-Drain Charge		Q_{gd}	--	5.3	--	
Turn-On Delay Time	$V_{DD}=20V, V_{GS}=10V, R_{GEN}=2.7\Omega, I_D=15A$	$T_{d(on)}$	--	8.5	--	nS
Rise Time		T_r	--	51	--	
Turn-Off Delay Time		$T_{d(off)}$	--	26.2	--	
Fall Time		T_f	--	6.5	--	
Input Capacitance	$V_{DS}=20V, V_{GS}=0V, f=1MHz$	C_{iss}	--	980	--	pF
Output Capacitance		C_{oss}	--	95	--	
Reverse Transfer Capacitance		C_{rss}	--	82	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Current	--	I_S	--	--	30	A
Diode Forward Voltage	$V_{GS}=0V, I_S=10A$	V_{SD}	--	--	1.2	V
Reverse Recovery Time	$I_F=15A, di/dt=100A/\mu s$	t_{rr}	--	12	--	nS
Reverse Recovery Charge		Q_{rr}	--	6.3	--	nC

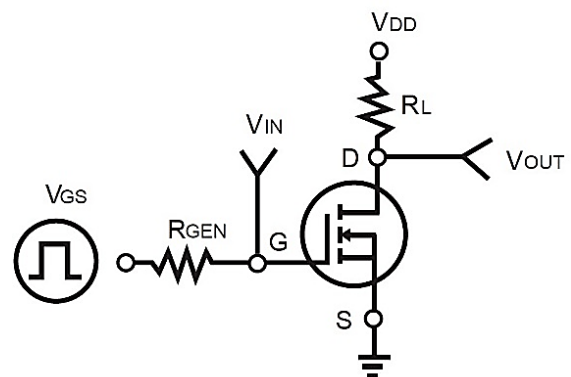
Note:

1. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
2. Thermal resistance from junction to soldering point (on the exposed drain pad).
3. EAS condition: $I_{AS}=12.8A, V_G=10V, L=0.5mH, R_G=25\Omega$
4. Guaranteed by design, not subject to production testing.

Switching Time Waveform



Switching Test Circuit



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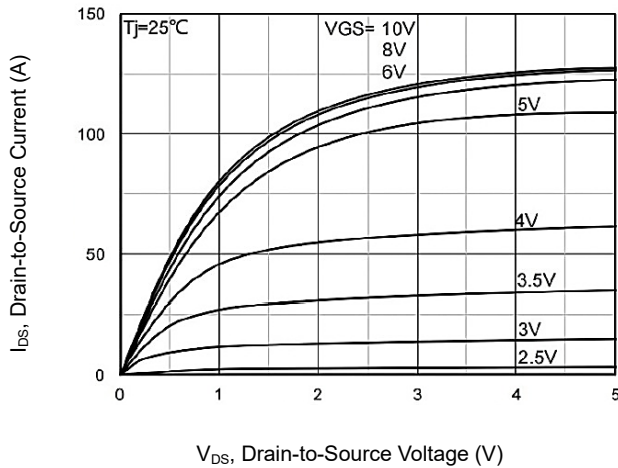
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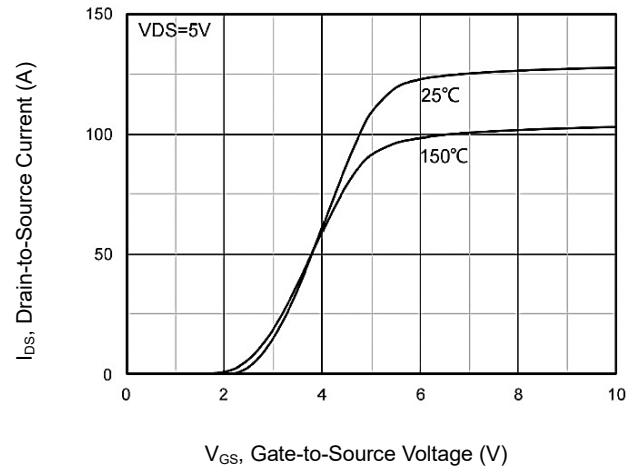
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CHARACTERISTIC CURVES

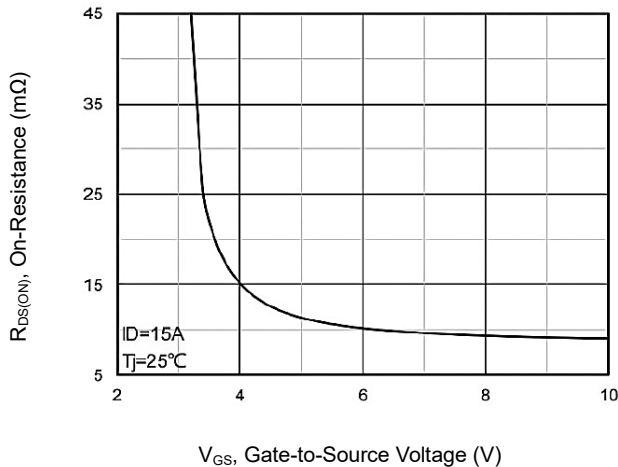
Output Characteristics



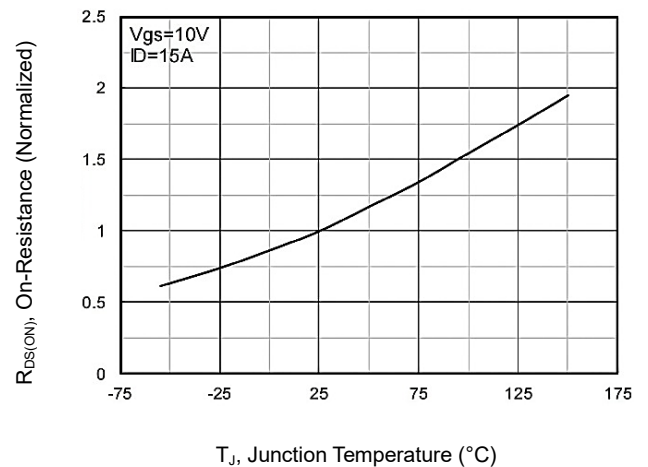
Transfer Characteristics



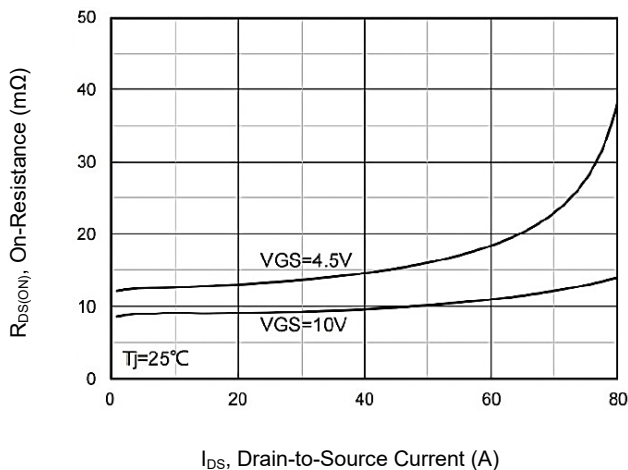
On-Resistance vs. Gate-to-Source Voltage



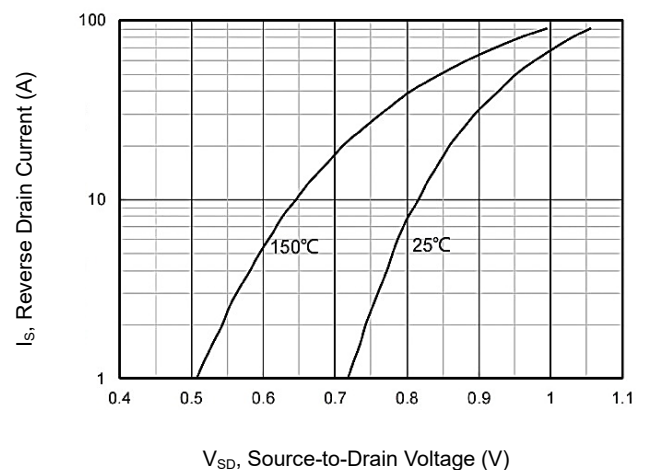
On-Resistance vs. Junction Temperature



On-Resistance vs. Drain Current



Body Diode Characteristics



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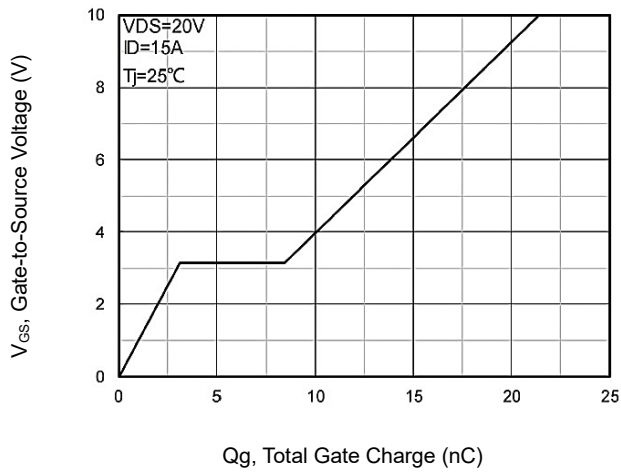
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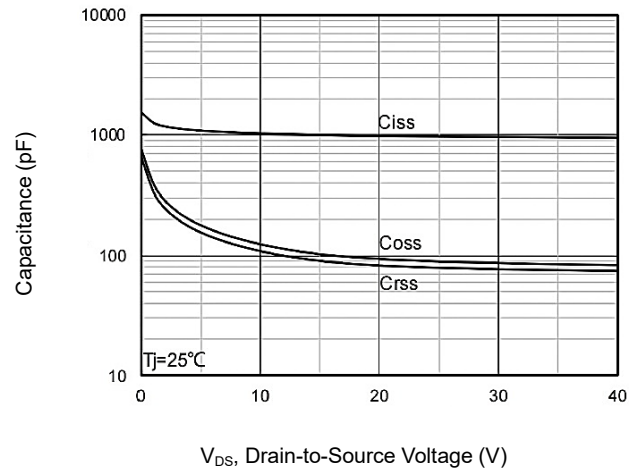
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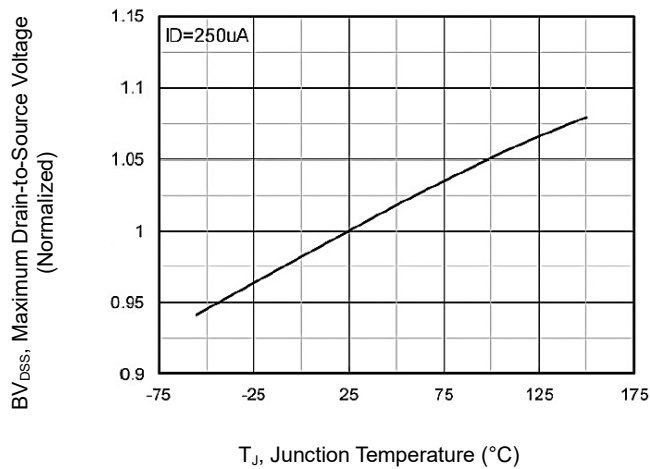
Gate Charge Characteristics



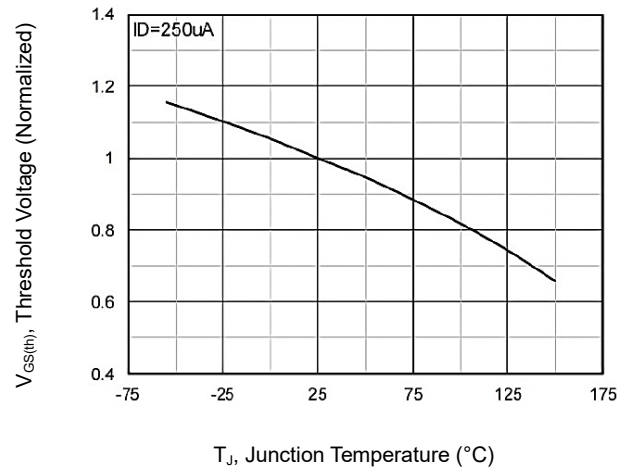
Capacitance



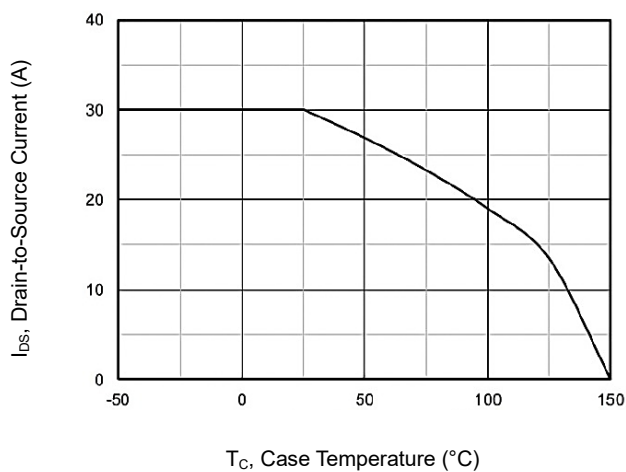
Normalized Breakdown Voltage



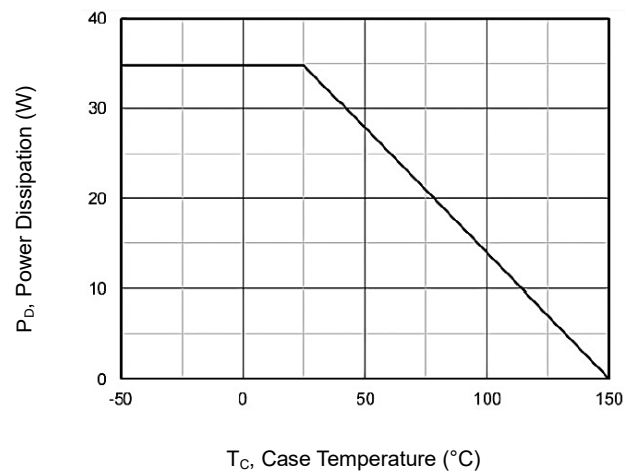
Normalized Threshold Voltage



Drain Current Dissipation



Power Dissipation



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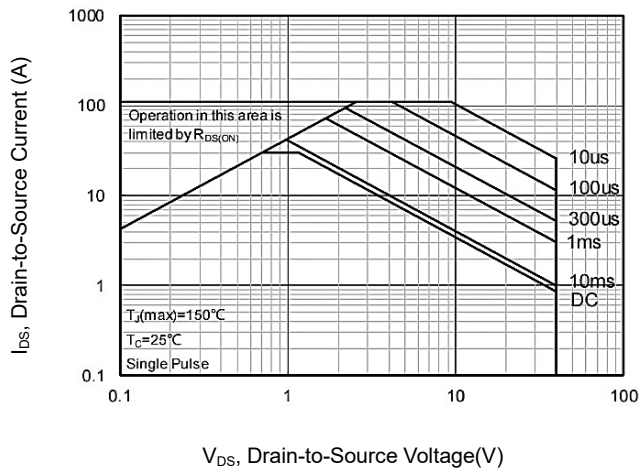
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CHARACTERISTIC CURVES

Maximum Safe Operating Area



Maximum Transient Thermal Impedance

