

N Channel MOSFET

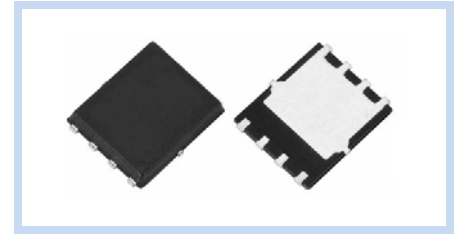
100V 40A 31.3W DFN3×3

MFT10N40D33

MERITEK

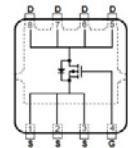
FEATURE

- $R_{DS(ON)} < 10.5m\Omega$, $V_{GS}=10V$, $I_D=20A$
- $R_{DS(ON)} < 17m\Omega$, $V_{GS}=4.5V$, $I_D=20A$
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handling capability
- Low reverse transfer capacitance



MECHANICAL DATA

- Case: DFN3×3-8L Package
- Terminals: Solderable per MIL-STD-750, Method 2026

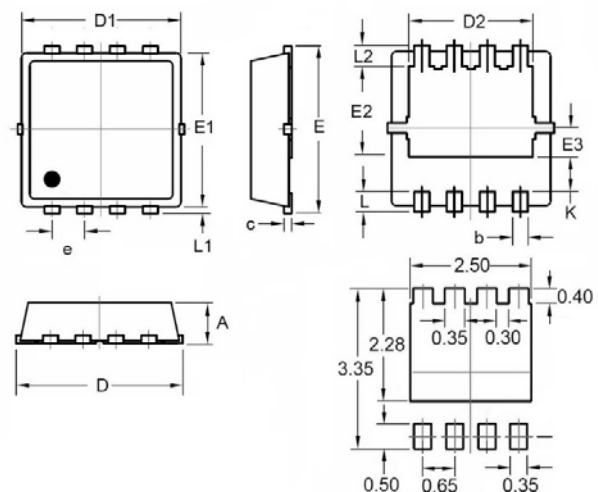


MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current – Continuous	at $R_{\theta JC}$	I_D	40	A
	at $R_{\theta JA}$		11	
Drain Current – Pulsed	at $R_{\theta JC}$	I_{DM}	160	A
	at $R_{\theta JA}$		44	
Power Dissipation		P_D	31.3	W
Thermal Resistance Junction to Case		$R_{\theta JC}$	4	$^{\circ}C/W$
Thermal Resistance Junction to Ambient		$R_{\theta JA}$	50	$^{\circ}C/W$
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 to +150	$^{\circ}C$

DIMENSIONS

Item	Min. (mm)	Max. (mm)
A	0.70	0.85
b	0.20	0.40
c	0.10	0.25
D	3.15	3.45
D1	3.00	3.25
D2	2.29	2.65
E	3.15	3.45
E1	2.90	3.20
E2	1.54	1.94
E3	0.37	0.77
e	0.65(BSC)	
K	0.50	0.89
L	0.30	0.50
L1	0.06	0.20
L2	0.27	0.57



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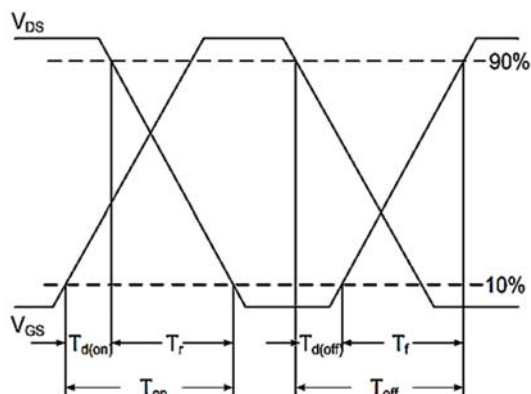
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	BV_{DSS}	100	--	--	V
Drain-Source Leakage Current	$V_{DS}=100V$, $V_{GS}=0V$,	I_{DSS}	--	--	1	μA
Gate-Source 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	$V_{GS}=10V$, $I_D=20A$	$R_{DS(ON)}$	--	8.8	10.5	m Ω
	$V_{GS}=4.5V$, $I_D=20A$		--	13	17	
Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	$V_{GS(th)}$	1	--	3	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=50V$, $V_{GS}=4.5V$, $I_D=20A$	Q_g	--	18	--	nC
Gate-Source Charge		Q_{gs}	--	4	--	
Gate-Drain Charge		Q_{gd}	--	11	--	
Turn-On Delay Time	$V_{DS}=50V$, $V_{GS}=10V$, $R_G=10\Omega$, $I_D=1A$	$T_{d(on)}$	--	19	--	nS
Rise Time		T_r	--	10	--	
Turn-Off Delay Time		$T_{d(off)}$	--	68	--	
Fall Time		T_f	--	39	--	
Input Capacitance	$V_{DS}=30V$, $V_{GS}=0V$, $F=1MHz$	C_{iss}	--	1505	--	pF
Output Capacitance		C_{oss}	--	570	--	
Reverse Transfer Capacitance		C_{rss}	--	20	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Current	--	I_S	--	--	24	A
Diode Forward Voltage	$V_{GS}=0V$, $I_S=10A$	V_{SD}	--	--	1.3	V

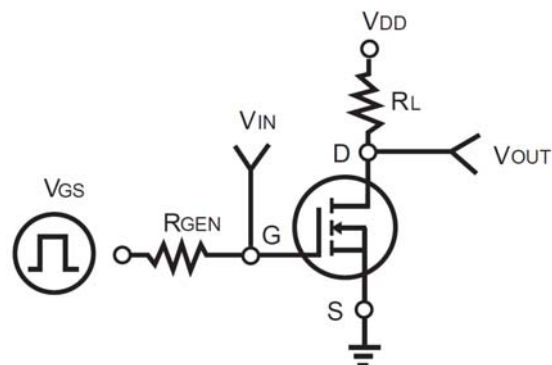
Note:

1. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
2. Guaranteed by design, not subject to production testing
3. The maximum current rating is package limited
4. Repetitive rating, pulse width limited by junction temperature.

Switching Time Waveform



Switching Test Circuit



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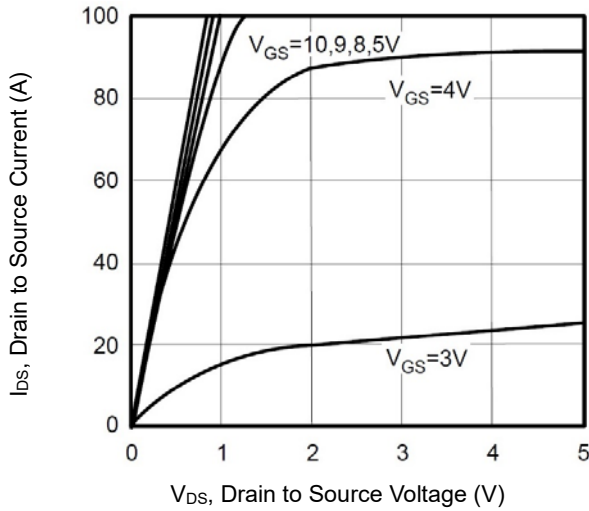
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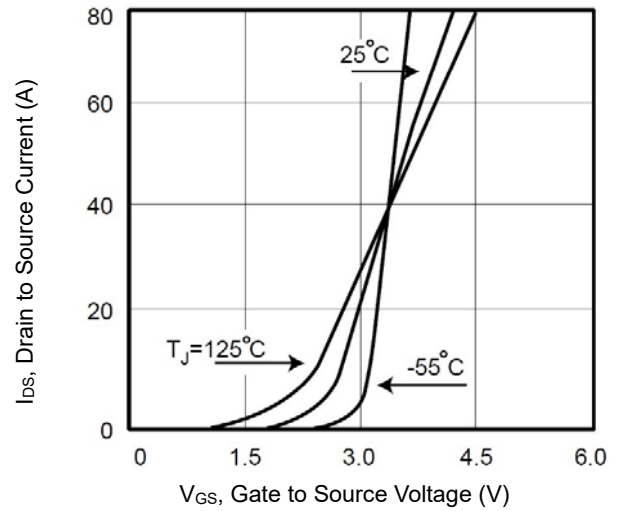
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CHARACTERISTIC CURVES

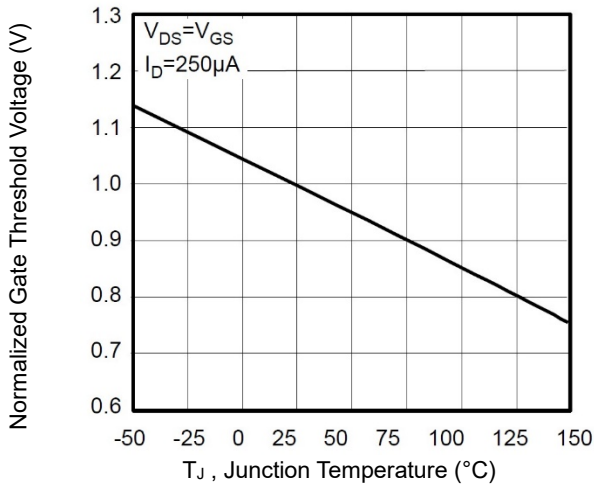
On-Region Characteristics



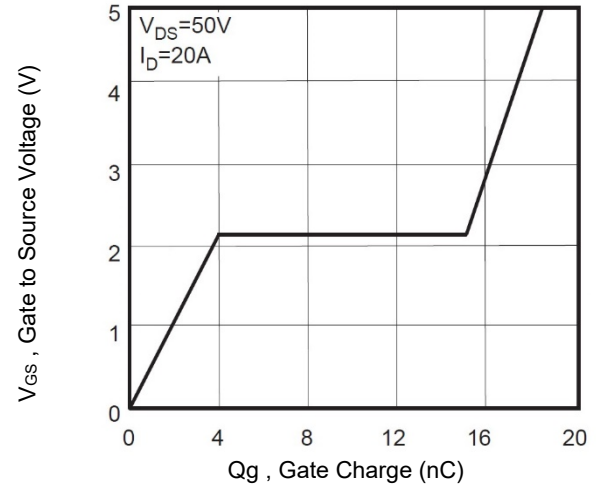
Transfer Characteristics



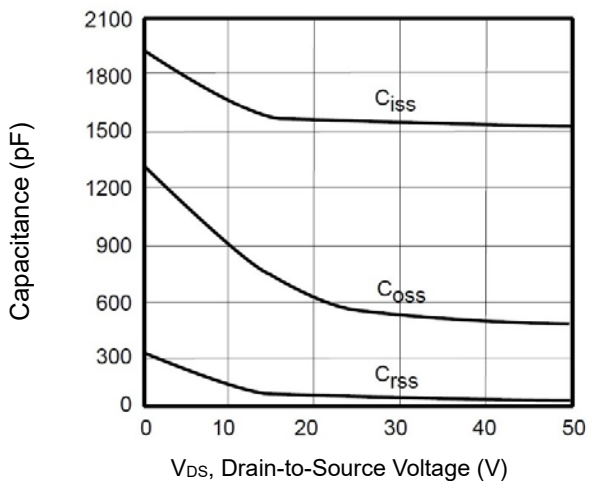
Normalized V_{th} vs. T_J



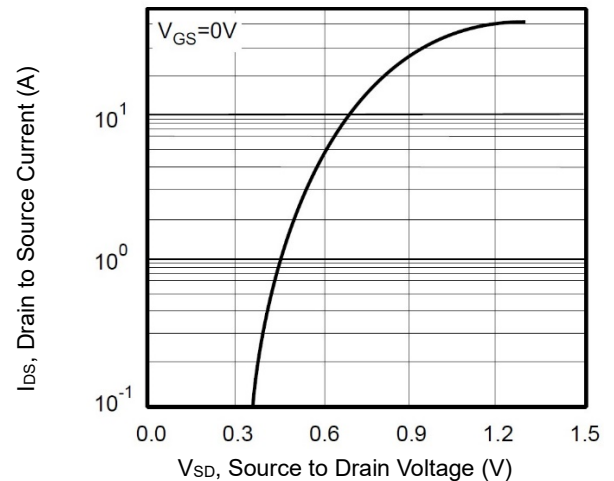
Gate Charge Waveform



Capacitance vs. Drain-Source Voltage



Body Diode Forward Voltage



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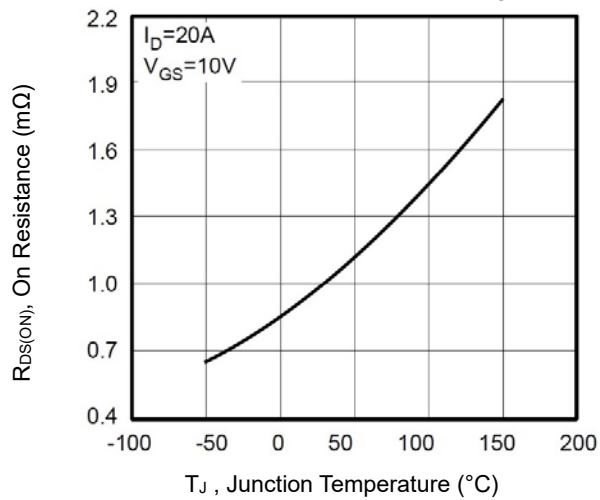
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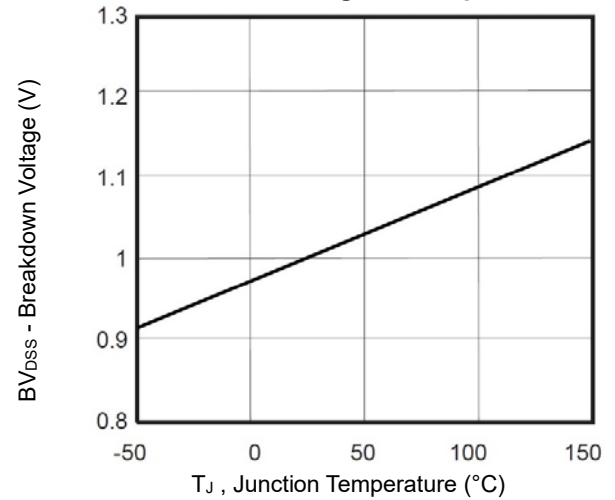
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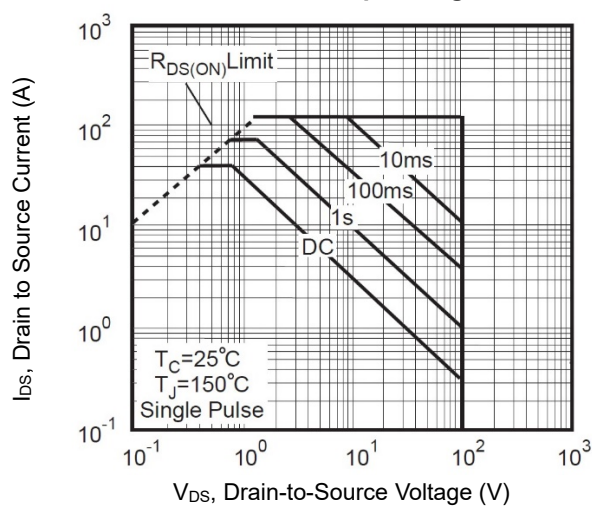
On-Resistance Variation with Temperature



Breakdown Voltage vs Temperature



Maximum Safe Operating Area



Normalized Transient Thermal Impedance Curves

