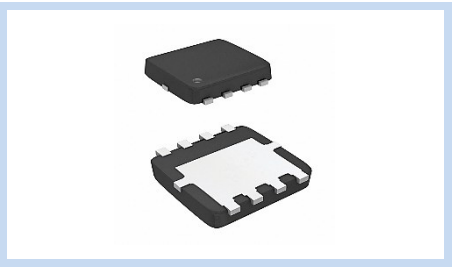
N-Channel MOSFET
40V 20A DFN3333-8L AEC-Q101

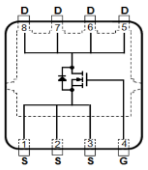
MFT4N20D33A

MERITEK

FEATURE



- $R_{DS(ON)}$<14.0mΩ at V_{GS}=10V
- $R_{DS(ON)}$<18.5mΩ at V_{GS}=4.5V
- High Density Cell Design for Ultra Low $R_{DS(ON)}$
- Application: High Current Load, Load Switching, Hard Switched and High Frequency Circuits, Uninterruptible Power Supply
- AEC-Q101 Compliant



RoHS

MECHANICAL DATA

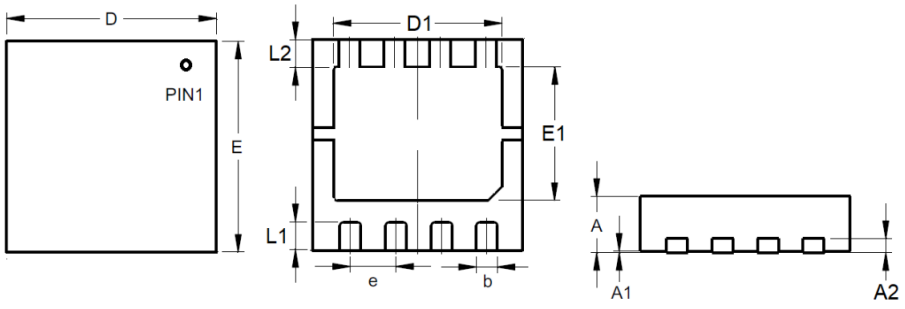
- Case: DFN3333-8L package
- Terminal: Solderable per MIL-STD-750, Method 2026

MAXIMUM RATINGS

Parameter, T_A=25°C		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current – Continuous		I_D	20	A
Drain Current – Pulsed		I_{DM}	90	A
Power Dissipation		P_D	21	W
Single Pulse Avalanche Energy		E_{AS}	70	mJ
Typical Thermal Resistance	Junction to Case	$R_{\theta JC}$	5.9	°C/W
Operating Junction Temperature		T_J	150	°C
Storage Temperature Range		T_{STG}	-55~150	°C

DIMENSIONS

Item	Min. (mm)	Max. (mm)
A	0.75	0.85
A1	0.05 (BSC)	
A2	0.18	0.22
b	0.25	0.35
D	3.20	3.30
D1	2.20	2.50
E	3.20	3.30
E1	1.80	2.00
e	0.60	0.70
L1	0.40	0.50
L2	0.30	0.40

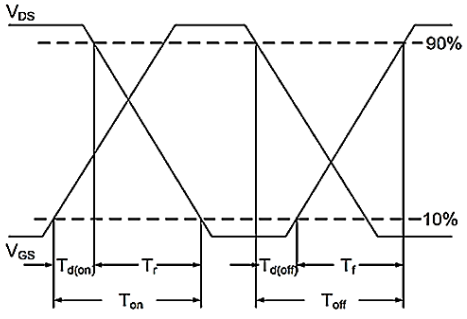


ELECTRICAL CHARACTERISTICS

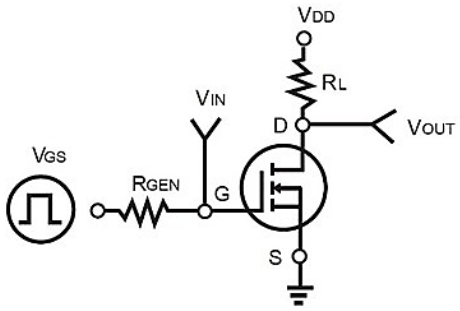
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250μA	BV_{DSS}	40	--	--	V
Zero Gate Voltage Drain Current	V_{DS}=40V , V_{GS}=0V	I_{DSS}	--	--	1	μA
Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	I_{GSS}	--	--	±100	nA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}=10V , I_D=20A	$R_{DS(ON)}$	--	--	14.0	mΩ
	V_{GS}=4.5V , I_D=10A		--	--	18.5	
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	$V_{GS(th)}$	1.0	--	2.5	V
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}=20V, I_D=20A V_{GS}=10V	Q_g	--	15	--	nC
Gate-Source Charge		Q_{gs}	--	3	--	
Gate-Drain Charge		Q_{gd}	--	2.5	--	
Turn-On Delay Time	V_{DS}=20V, V_{GS}=10V, I_D=2A R_G=3Ω, R_L=1Ω	$T_{d(on)}$	--	6	--	ns
Rise Time		T_r	--	17.5	--	
Turn-Off Delay Time		$T_{d(off)}$	--	31	--	
Fall Time		T_f	--	17	--	
Input Capacitance	V_{DS}=20V, V_{GS}=0V f=1MHz	C_{iss}	--	750	--	pF
Output Capacitance		C_{oss}	--	150	--	
Reverse Transfer Capacitance		C_{rss}	--	80	--	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Continuous Source Current	--	I_S	--	--	20	A
Diode Forward Voltage	V_{GS}=0V , I_S=20A	V_{SD}	--	--	1.2	V
Reverse Recovery Time	I_F=20A, dI/dt=100A/μs T_J=25°C	T_{rr}	--	29	--	ns
Reverse Recovery Charge		Q_{rr}	--	26	--	nC

Note:
1. T_A=25°C, unless otherwise noted
2. Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.

Switching Time Waveform

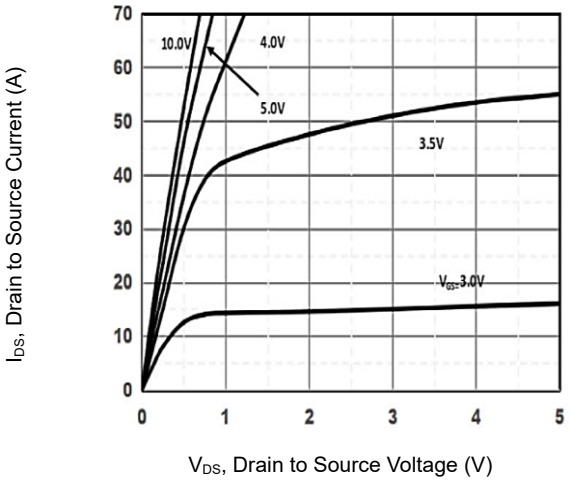


Switching Test Circuit

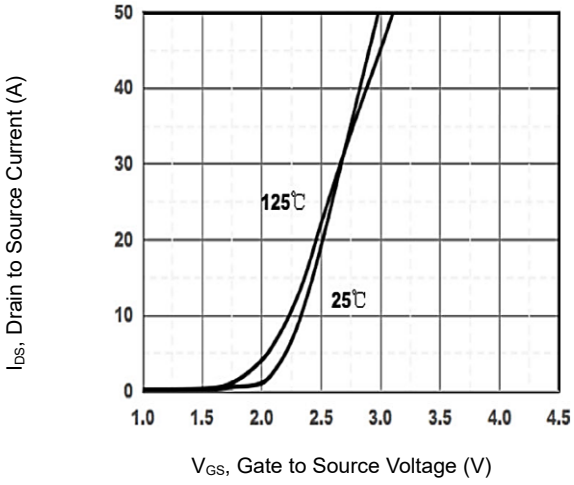


CHARACTERISTIC CURVES

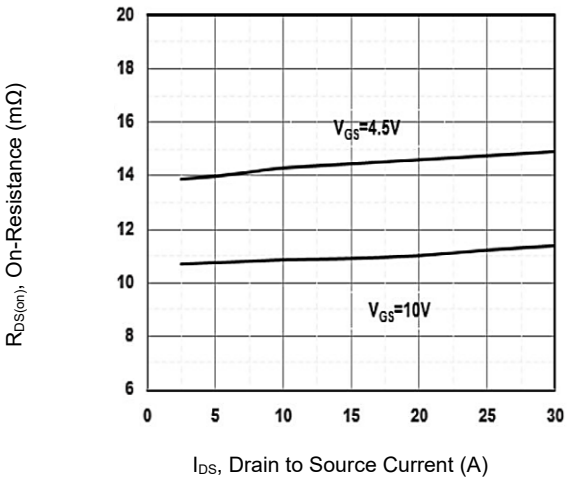
On-Region Characteristic



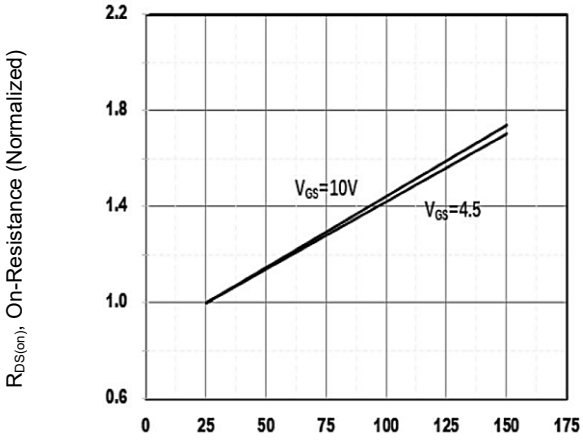
Transfer Characteristics



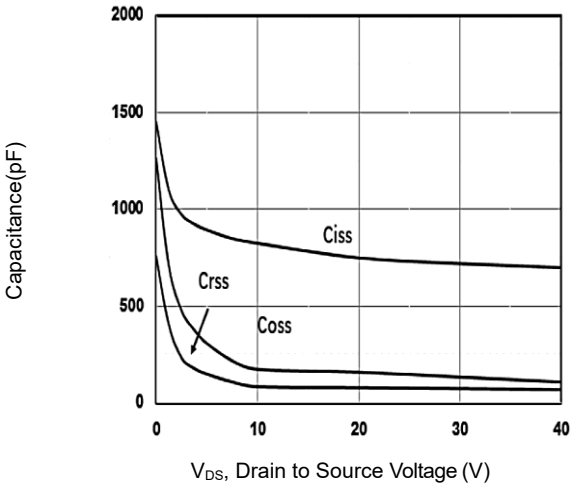
On-Resistance vs. Drain Current



On-Resistance vs. Junction Temperature



Capacitance vs. Drain-Source Voltage



Gate-Charge Characteristics