N-Channel MOSFET AEC-Q101
65V 48A 41.7W DFN3×3-8L

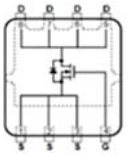
MFT6N48D33A

MERITEK

FEATURE

- $R_{DS(ON)}$<8.5mΩ, V_{GS}=10V, I_D=10A
- $R_{DS(ON)}$<16mΩ, V_{GS}=4.5V, I_D=8A
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handing capability
- Low reverse transfer capacitance
- AEC-Q101 qualified

MECHANICAL DATA



RoHS

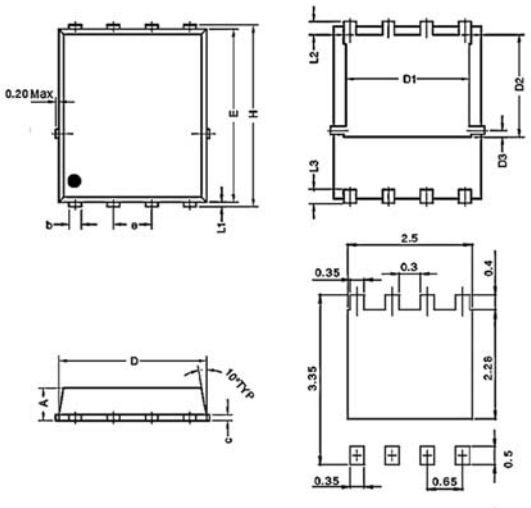
- Case: DFN3×3-8L Package
- Terminals: Solderable per MIL-STD-750, Method 2026

MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	65	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current – Continuous	T_C=25°C	I_D	48	A
	T_A=100°C		30	
Drain Current – Pulsed		I_{DM}	160	A
Avalanche Current		I_{AS}	12	
Avalanche Energy		E_{AS}	36	mJ
Power Dissipation	T_C=25°C	P_D	41.7	W
Thermal Resistance Junction to Case		$R_{\theta JC}$	3	°C/W
Thermal Resistance Junction to Ambient		$R_{\theta JA}$	50	°C/W
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 to +150	°C

DIMENSIONS

Item	Min. (mm)	Max. (mm)
A	0.70	0.90
b	0.24	0.35
c	0.10	0.25
D	3.00	3.20
D1	2.40	2.60
D2	1.65	1.85
D3	0.48	0.68
H	3.10	3.30
E	2.90	3.10
e	0.60	0.70
L1	0.20	
L2	0.33	0.53
L3	0.30	0.50

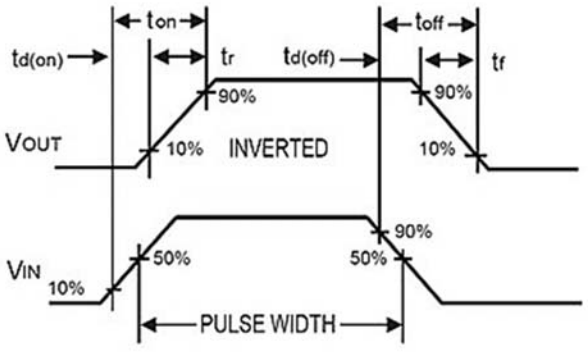


ELECTRICAL CHARACTERISTICS

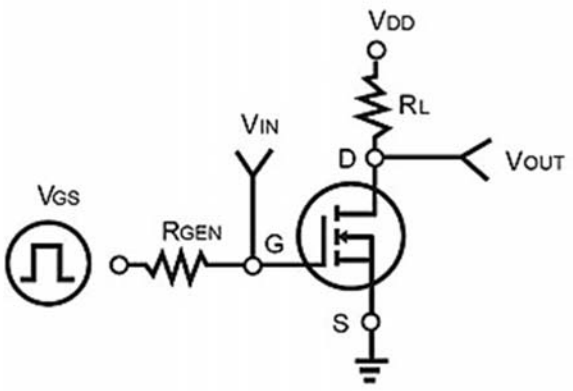
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250μA	BV_{DSS}	65	--	--	V
Drain-Source Leakage Current	V_{DS}=52V, V_{GS}=0V,	I_{DSS}	--	--	1	μA
Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	--	--	±100	nA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}=10V, I_D=10A	$R_{DS(ON)}$	--	7	8.5	mΩ
	V_{GS}=4.5V, I_D=8A		--	8.9	12	
Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250μA	$V_{GS(th)}$	1.2	--	2.5	V
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Gate Resistance	V_{DS}=0V , V_{GS}=0V , F=1MHz	R_g	--	2	--	Ω
Total Gate Charge	V_{DS}=30V, V_{GS}=4.5V, I_D=10A	Q_g	--	7.2	--	nC
	V_{DS}=30V, V_{GS}=10V, I_D=10A		--	14	--	
Gate-Source Charge		Q_{gs}	--	2.6	--	
Gate-Drain Charge		Q_{gd}	--	2.8	--	
Turn-On Delay Time	V_{DS}=30V, V_{GS}=10V, R_G=4.7Ω, I_D=10A	$T_{d(on)}$	--	10	--	nS
Rise Time		T_r	--	16	--	
Turn-Off Delay Time		$T_{d(off)}$	--	9	--	
Fall Time		T_f	--	2	--	
Input Capacitance	V_{DS}=30V , V_{GS}=0V , F=1MHz	C_{iss}	--	825	--	pF
Output Capacitance		C_{oss}	--	290	--	
Reverse Transfer Capacitance		C_{rss}	--	15	--	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Forward Current	--	I_S	--	--	48	A
Diode Pluse Current		I_{SM}	--	--	160	A
Diode Forward Voltage	V_{GS}=0V , I_S=1A	V_{SD}	--	--	1.2	V
Reverse Recovery Time	I_S=10A, di/dt=100A/μs	t_{rr}	--	17	--	nS
Reverse Recovery Charge		Q_{rr}	--	6.5	--	nC

Note:
1. Pulse width≤100μs, duty cycle≤2%, Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
2. Guaranteed by design,not subject to production testing.
3. Limited by $T_{J(MAX)}$, starting T_J=25°C, L= 0.5mH, Rg=25Ω,I_{AS}=12A, V_{GS}=10V.
4. Surface Mounted on FR-4 substrate PC board, 2oz copper, with 1-inch^2 copper plate in still air.

Switching Time Waveform

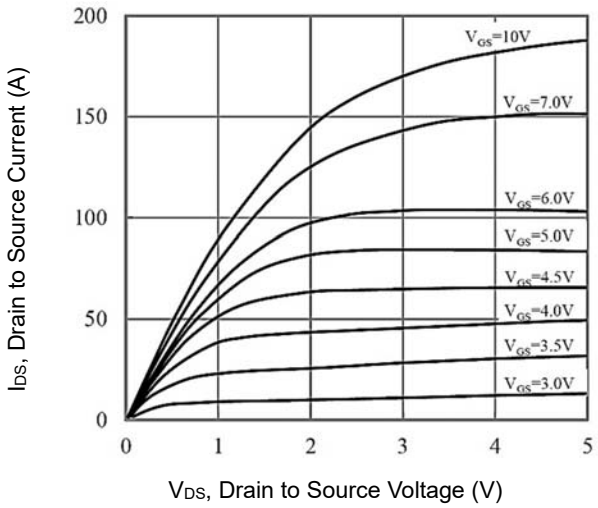


Switching Test Circuit

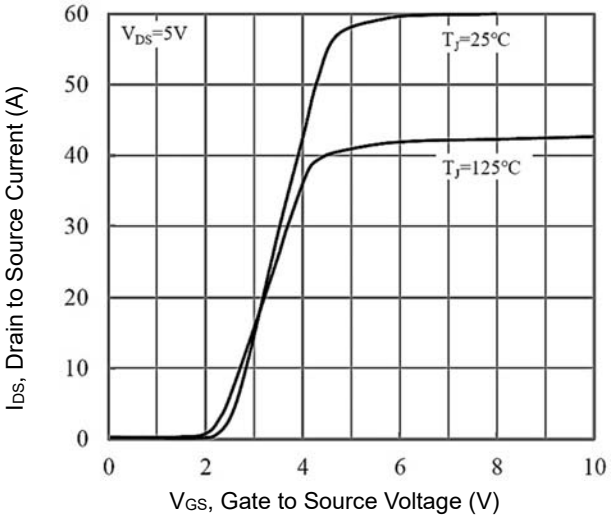


CHARACTERISTIC CURVES

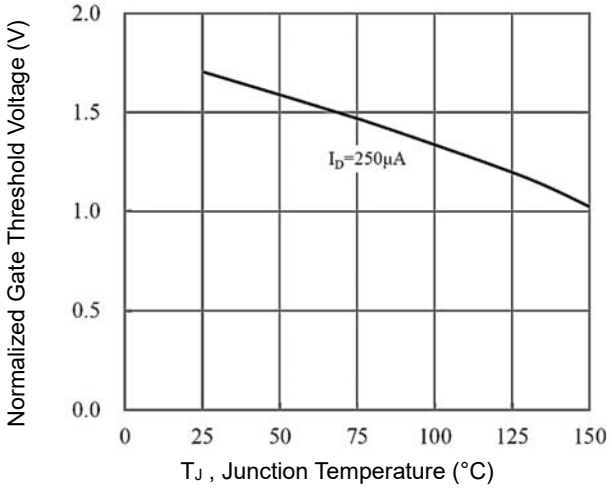
On-Region Characteristics



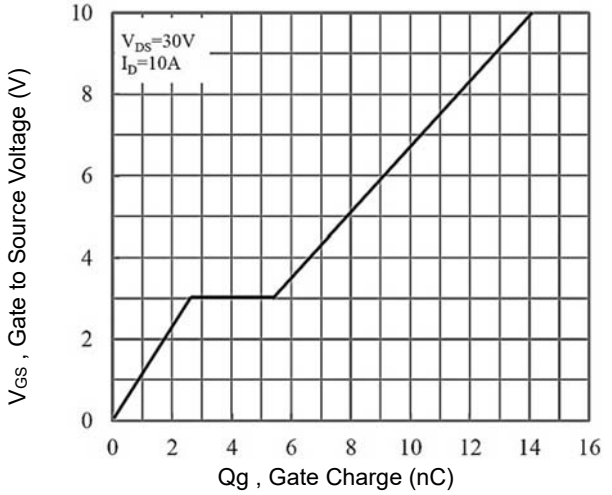
Transfer Characteristics



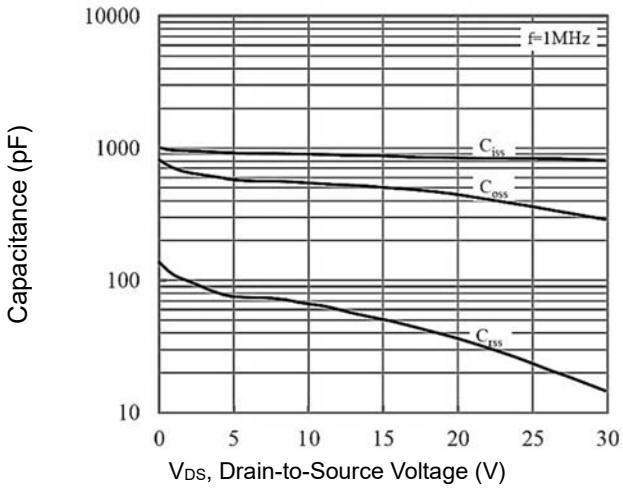
Normalized V_{th} vs. T_J



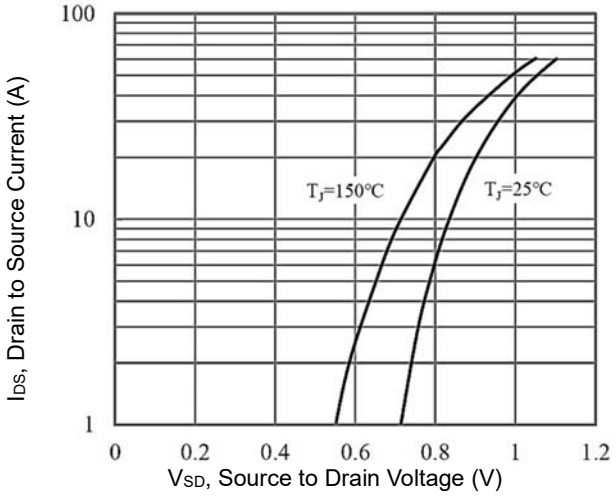
Gate Charge Waveform



Capacitance vs. Drain-Source Voltage

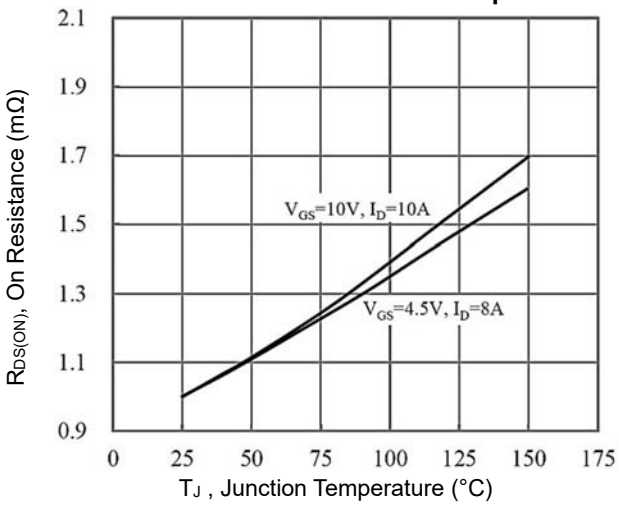


Body Diode Forward Voltage

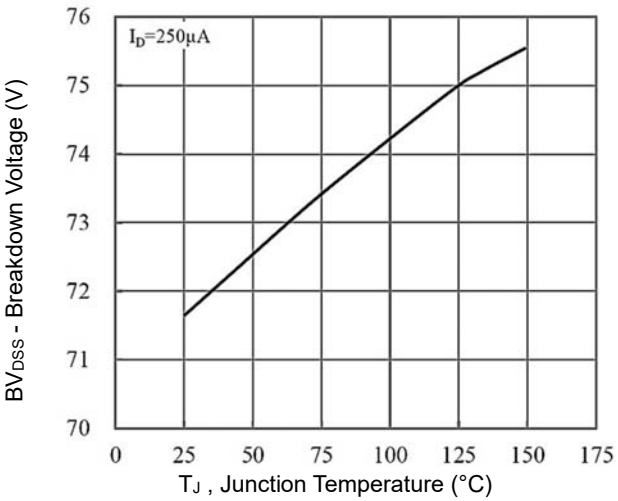


CHARACTERISTIC CURVES

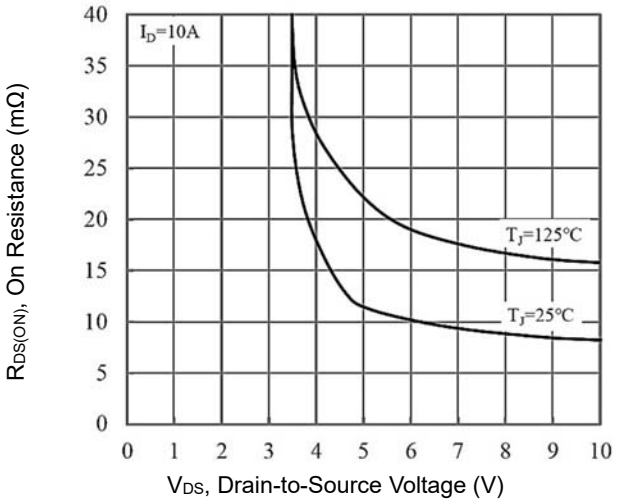
On-Resistance Variation with Temperature



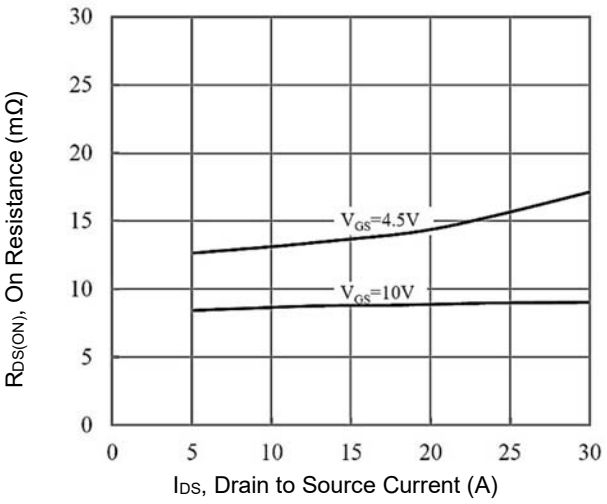
Breakdown Voltage vs Temperature



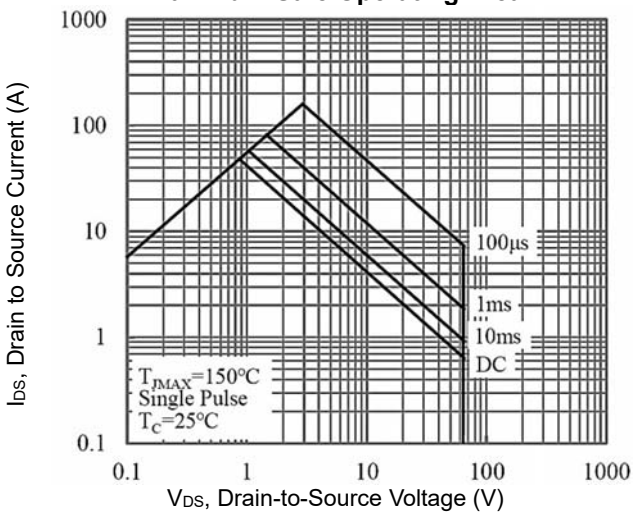
On-Resistance Variation with VGS



On-Resistance vs. Drain Current

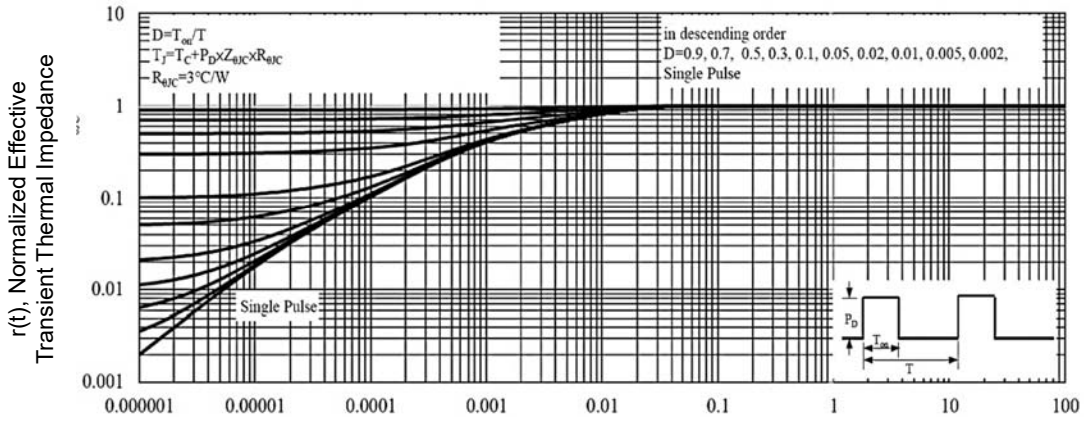


Maximum Safe Operating Area



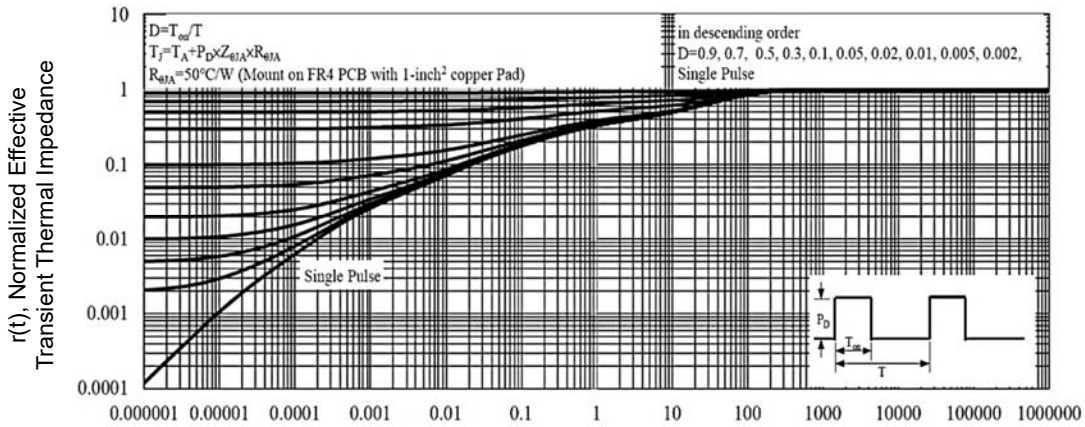
CHARACTERISTIC CURVES

Normalized Transient Thermal Impedance Curves



Square Wave Pulse Duration (s)

Normalized Transient Thermal Impedance Curves



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