

N-Channel MOSFET

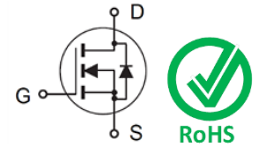
100V 434A 375W TOLL

MFT10N434TOLL

MERITEK

FEATURE

- $R_{DS(ON)} \leq 1.3m\Omega$ at $V_{GS}=10V$
- Low Gate Charge
- Excellent Low $R_{DS(ON)}$
- Application: DC/DC Converter, LED Backlighting, Power Management Switches



MECHANICAL DATA

- Case: TOLL 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	$T_C = 25^\circ C$	I_D	434	A
	$T_C = 100^\circ C$		307	
	$T_A = 25^\circ C$		43	
	$T_A = 70^\circ C$		36	
Drain Current – Pulsed	$T_C = 25^\circ C$	I_{DM}	1086	A
Single Pulse Avalanche Current	$L=0.1mH$	I_{AS}	100	A
	$L=0.5mH$		55	
Single Pulse Avalanche Energy	$L=0.1mH$	E_{AS}	500	mJ
	$L=0.5mH$		750	
Power Dissipation	$T_C = 25^\circ C$	P_D	375	W
	$T_C = 100^\circ C$		188	
	$T_A = 25^\circ C$		3.8	
	$T_A = 70^\circ C$		2.6	
Thermal Resistance from Junction to Ambient		$R_{\theta JA}$	40	$^\circ C/W$
Thermal Resistance from Junction to Case		$R_{\theta JC}$	0.4	$^\circ C/W$
Operating Junction Temperature		T_J	175	$^\circ C$
Storage Temperature Range		T_{stg}	-55 to 175	$^\circ C$

N-Channel MOSFET

100V 434A 375W TOLL

MFT10N434TOLL

MERITEK

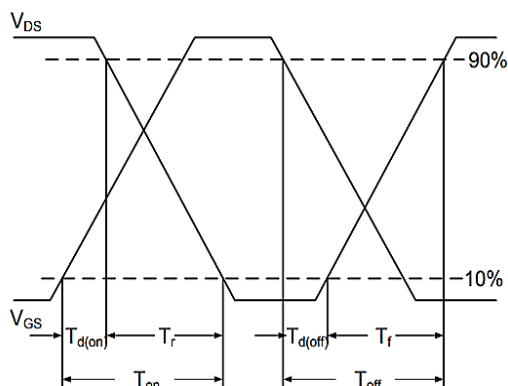
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	100	--	--	V
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	$V_{GS(th)}$	2	--	4	V
Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	I_{GSS}	--	--	± 0.1	μA
Zero Gate Voltage Drain Current	$V_{DS}=80V, V_{GS}=0V$	I_{DSS}	--	--	1.0	μA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=30A$	$R_{DS(ON)}$	--	1.05	1.3	m Ω
Forward Transconductance	$V_{DS}=5V, I_D=50A$	g_{FS}	--	108	--	S
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Gate Resistance	$V_{DS}=0V, V_{GS}=0V, F=1.0MHz$	R_g	--	1.7	--	Ω
Input Capacitance	$V_{DS}=50V, V_{GS}=0V, F=1.0MHz$	C_{iss}	--	13000	--	pF
Output Capacitance		C_{oss}	--	2147	--	
Reverse Transfer Capacitance		C_{rss}	--	398	--	
Turn-On Delay Time	$V_{DS}=50V, I_D=1A, V_{GS}=10V, R_G=1\Omega$	$T_{d(on)}$	--	27.7	--	nS
Rise Time		T_r	--	21.5	--	
Turn-Off Delay Time		$T_{d(off)}$	--	89.6	--	
Fall Time		T_f	--	96.8	--	
Total Gate Charge	$V_{DS}=50V, V_{GS}=10V, I_D=100A$	Q_g	--	231	--	nC
Gate-Source Charge		Q_{gs}	--	70.2	--	
Gate-Drain Charge		Q_{gd}	--	65.7	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Voltage	$I_S=30A, V_{GS}=0V$	V_{SD}	--	0.75	1.1	V
Diode Forward Current	--	I_S	--	--	171	A
Reverse Recovery Time	$I_{DS}=30A, di/dt=100A/\mu s$	t_{rr}	--	120	--	nS
Reverse Recovery Charge		Q_{rr}	--	400	--	nC

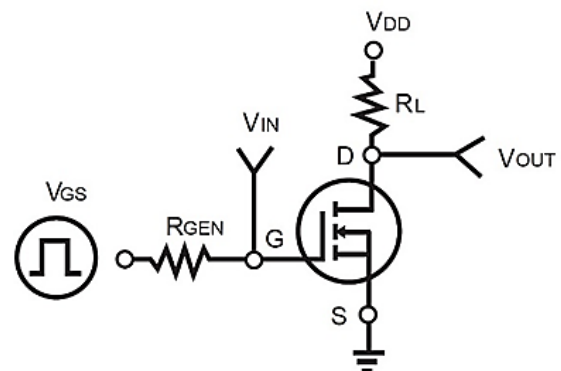
Note:

1. $T_A = 25^\circ C$ unless otherwise noted.
2. Pulse test: Pulse width < 300 μs , Duty cycle < 2%.
3. Maximum current is limited by max. junction temperature
4. Device mounted on 1 inch square FR-4 board with 1oz copper.
5. UIS tested and width are limited by maximum junction temperature $T_{J(MAX)}=175^\circ C$.

Switching Time Waveform

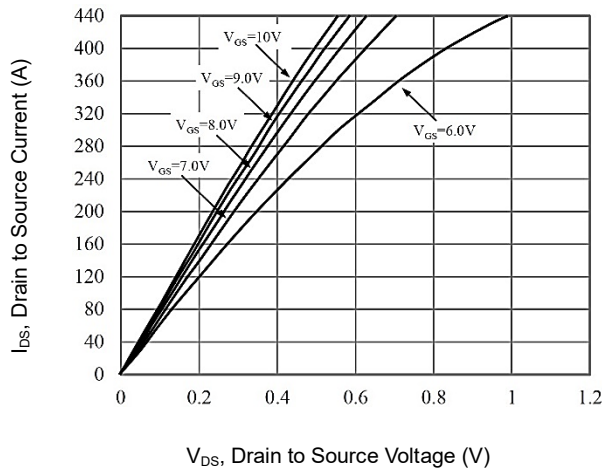


Switching Test Circuit

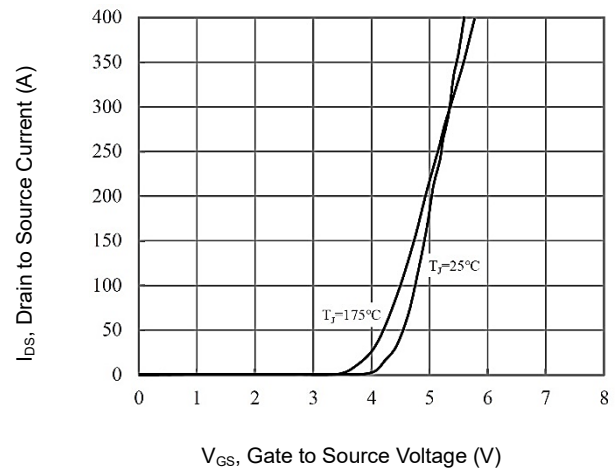


CHARACTERISTIC CURVES

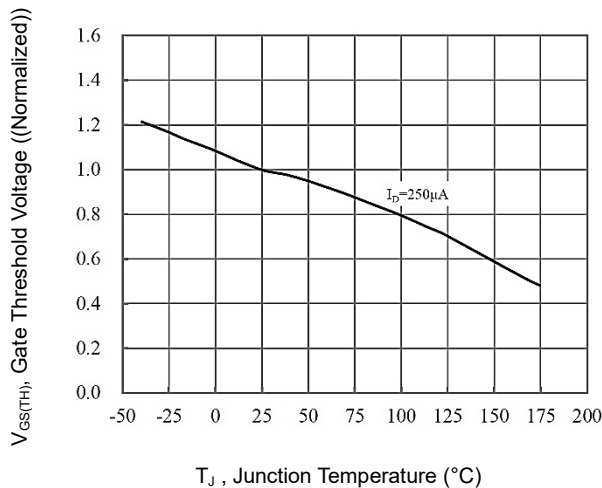
On-Region Characteristic



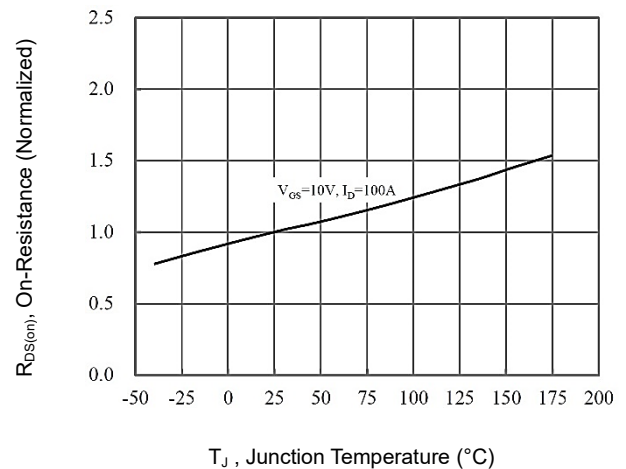
Transfer Characteristics



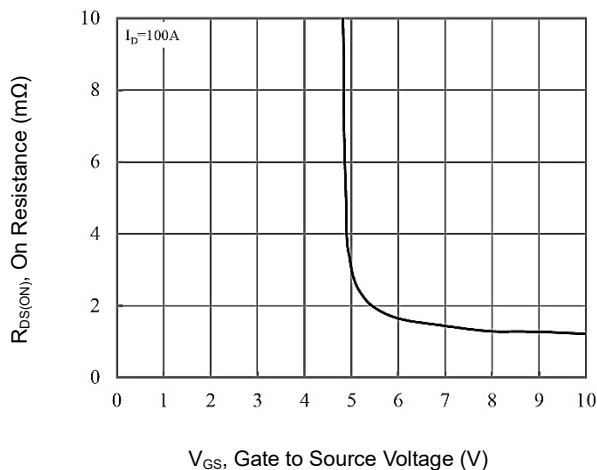
Threshold Voltage vs Junction Temperature



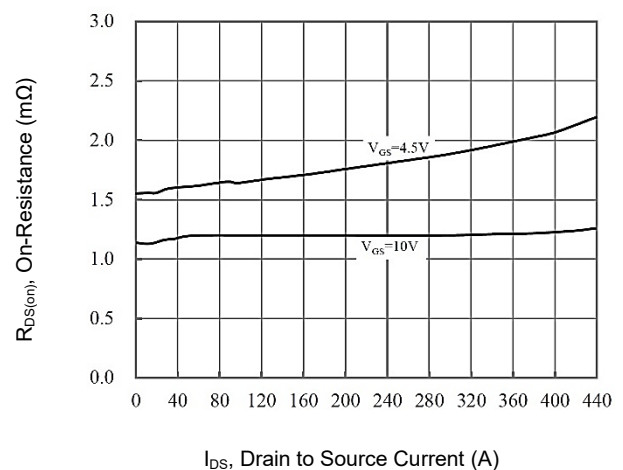
On-Resistance vs. Junction Temperature



On-Resistance Variation with V_{GS}

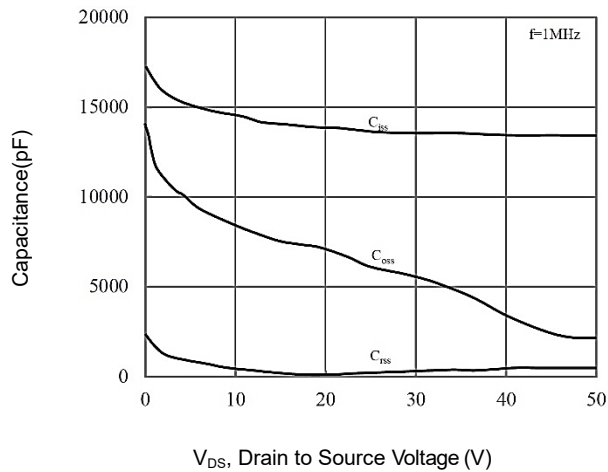


On-Resistance vs. Drain Current

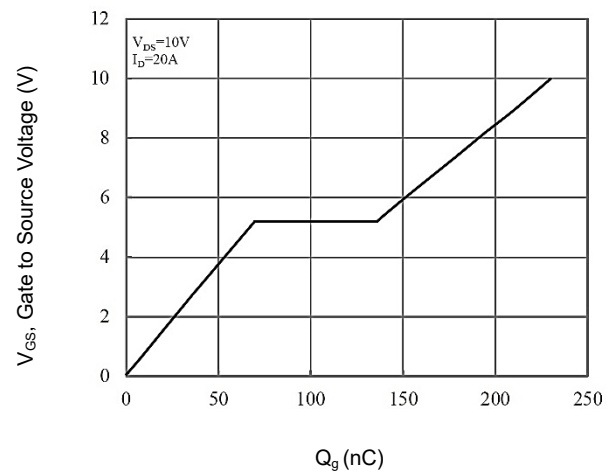


CHARACTERISTIC CURVES

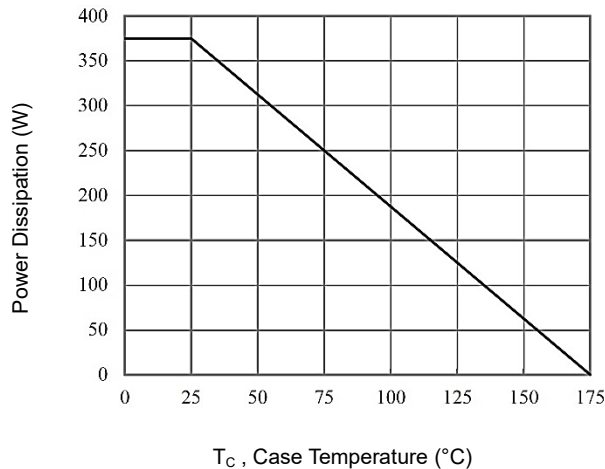
Capacitance vs. Drain-Source Voltage



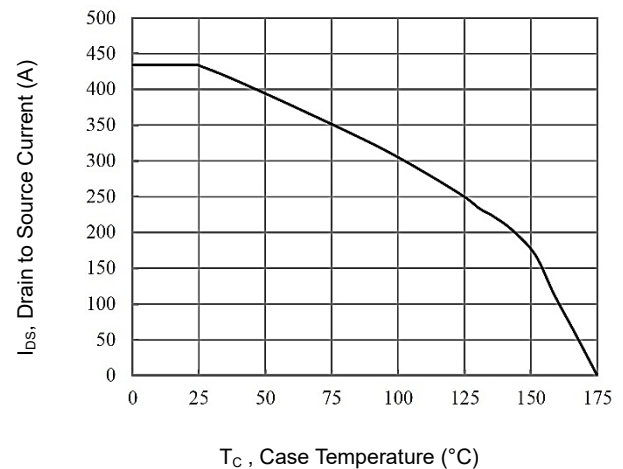
Gate-Charge Characteristics



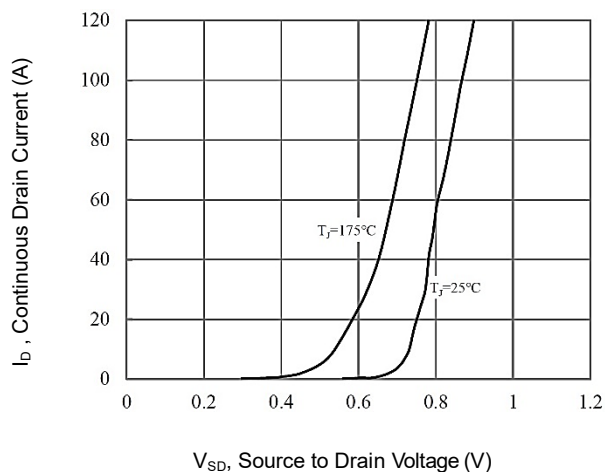
Power Dissipation



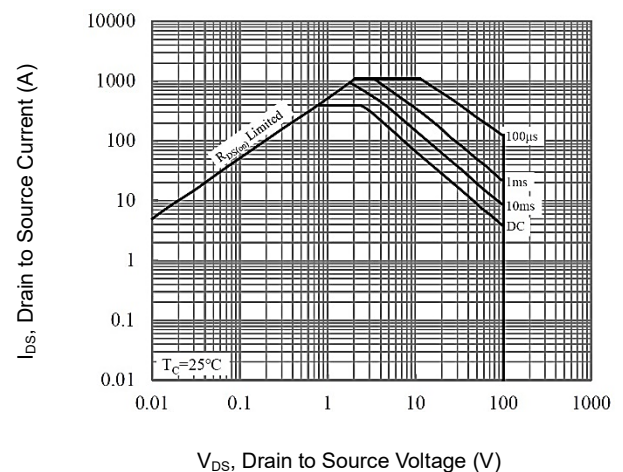
Drain Current



Source-Drain Diode Forward Voltage

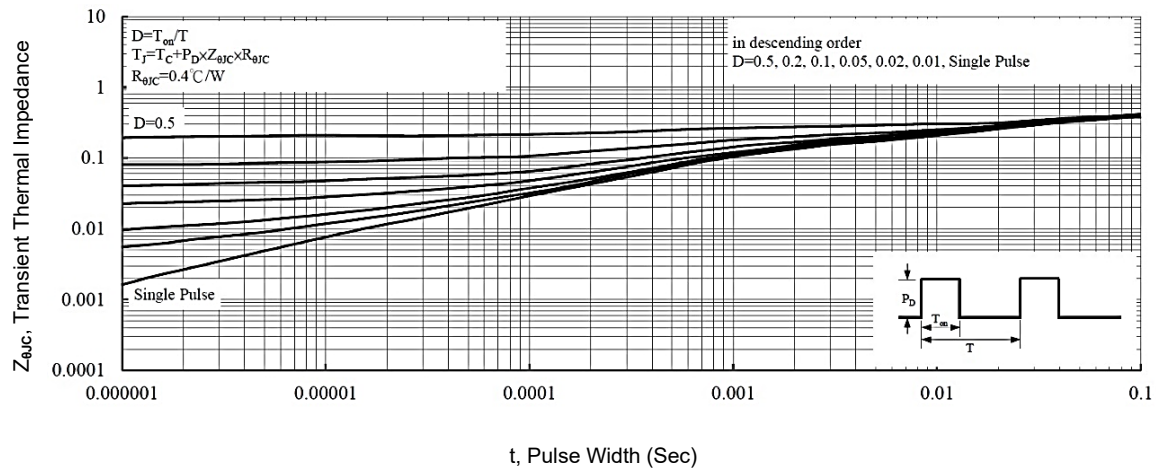


Maximum Safe Operating Area



CHARACTERISTIC CURVES

Normalized Transient Thermal Impedance



DIMENSIONS

Item	Min (mm)	Max (mm)
A	2.20	2.40
b	0.70	0.90
c	0.40	0.60
D	11.58	11.78
D1	10.28	10.48
D2	6.95 BSC	
D3	3.20	3.40
e	1.20 BSC	
E	9.70	9.90
E2	8.00	8.20
K	3.10 BSC	
L	0.50	0.70
L1	0.60	0.80
L2	1.40	2.10
L3	1.05	1.25

Note:
 Pin Layout: Tab: Drain(D), 1: Gate(G),
 2,3,4,5,6,7,8: Source(S)

