

# N-Channel MOSFET

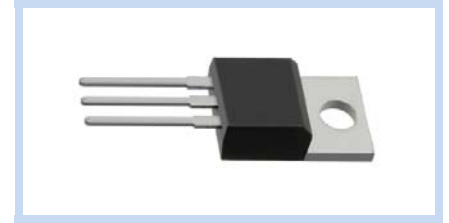
## 60V 33A 43W TO-220

MFT6N33T220

MERITEK

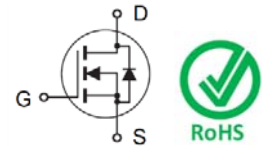
### FEATURE

- $R_{DS(ON)} < 20m\Omega$ ,  $V_{GS}=10V$ ,  $I_D=15A$
- $R_{DS(ON)} < 25m\Omega$ ,  $V_{GS}=4.5V$ ,  $I_D=7.5A$
- Super high dense cell design for extremely low  $R_{DS(ON)}$
- High power and current handling capability



### MECHANICAL DATA

- Case: TO-220 Package
- Terminal: Solderable per MIL-STD-750, Method 2026

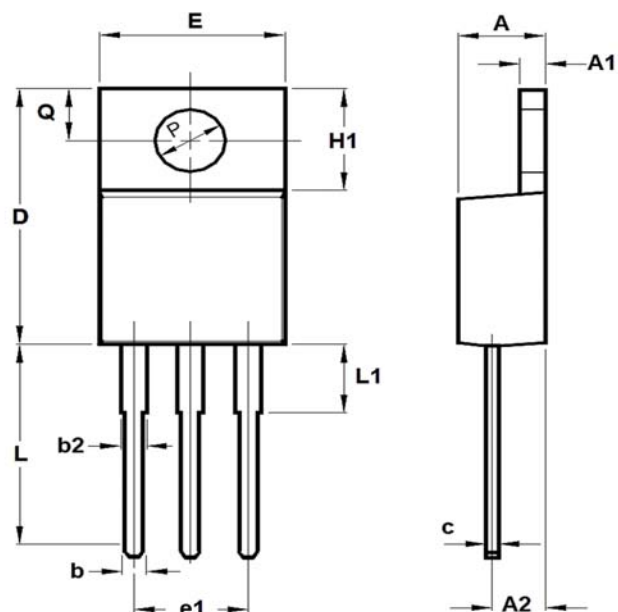


### MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current – Continuous	$I_D$	$T_c=25^\circ C$	33
		$T_c=100^\circ C$	23
Drain Current – Pulsed	$I_{DM}$	132	A
Single Pulse Avalanche Energy	$E_{AS}$	50	mJ
Single Pulse Avalanche Current	$I_{AS}$	10	A
Power Dissipation	$P_D$	$T_c=25^\circ C$	43
		Derate above $25^\circ C$	0.29
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ C/W$
Thermal Resistance Junction to Case	$R_{\theta JC}$	3.5	$^\circ C/W$
Operating Junction and Storage Temperature	$T_J, T_{STG}$	-55 ~ 175	$^\circ C$

### DIMENSIONS

Item	Min. (mm)	Max. (mm)
A	4.320	4.826
A1	1.220	1.397
A2	2.032	2.921
b	0.610	0.910
b2	1.143	1.778
c	0.356	0.530
D	14.224	16.510
E	9.652	10.668
e1	5.080	5.080
H1	5.842	6.858
L	12.700	14.732
L1	3.400	4.000
Q	2.540	3.429



# N-Channel MOSFET

## 60V 33A 43W TO-220

MFT6N33T220

MERITEK

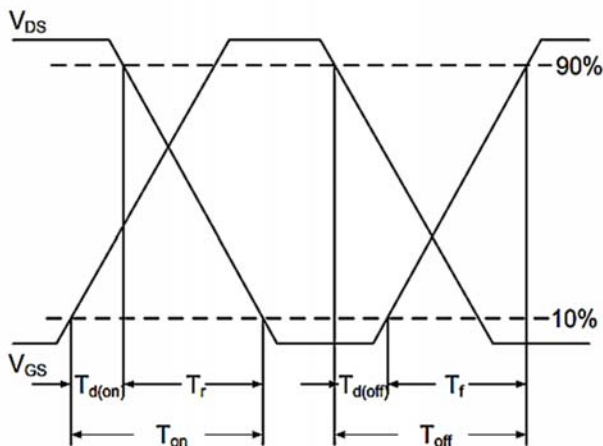
### ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	$BV_{DSS}$	60	--	--	V
Drain-Source Leakage Current	$V_{DS}=60V, V_{GS}=0V$	$I_{DSS}$	--	--	1	$\mu A$
Gate Leakage Current, Forward	$V_{GS}=20V, V_{DS}=0V$	$I_{GSSF}$	--	--	100	nA
Gate Leakage Current, Reverse	$V_{GS}=-20V, V_{DS}=0V$	$I_{GSSR}$	--	--	-100	
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=15A$	$R_{DS(ON)}$	--	14	20	m $\Omega$
	$V_{GS}=4.5V, I_D=7.5A$		--	18	25	
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	$V_{DS}=48V, V_{GS}=20V, I_D=20A$	$Q_g$	--	13	--	nC
Gate-Source Charge		$Q_{gs}$	--	2	--	
Gate-Drain Charge		$Q_{gd}$	--	10	--	
Turn-On Delay Time	$V_{DD}=30V, R_G=4.7\Omega, I_D=20A, V_{GS}=10V$	$T_{d(on)}$	--	14	--	ns
Rise Time		$T_r$	--	6	--	
Turn-Off Delay Time		$T_{d(off)}$	--	37	--	
Fall Time		$T_f$	--	9	--	
Input Capacitance		$C_{iss}$	--	780	--	
Output Capacitance	$C_{oss}$	--	115	--		
Reverse Transfer Capacitance	$C_{rss}$	--	95	--		
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Current-Continuous	--	$I_S$	--	--	33	A
Diode Forward Voltage	$V_{GS}=0V, I_S=33A$	$V_{SD}$	--	--	1.2	V

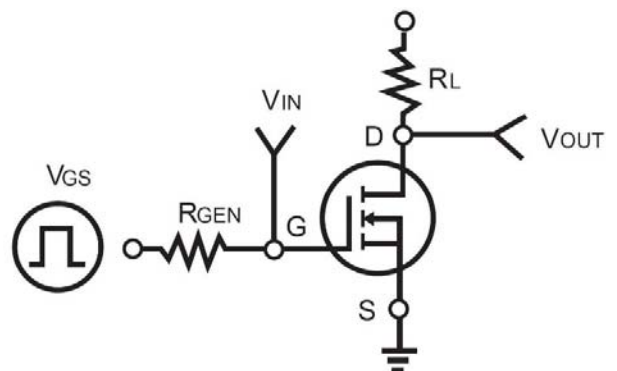
**Note:**

1.  $L=1mH, I_{AS}=10A, V_{DD}=25V, R_G=25\Omega$ , Starting  $T_J=25^\circ C$
2. Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 2\%$
3. Essentially Independent of operating temperature typical characteristics.
4. Guaranteed by design, not subject to production testing.

Switching Time Waveform



Switching Test Circuit



# N-Channel MOSFET

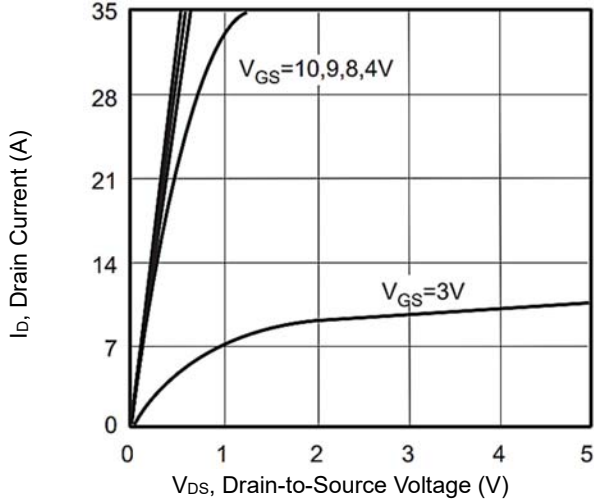
## 60V 33A 43W TO-220

MFT6N33T220

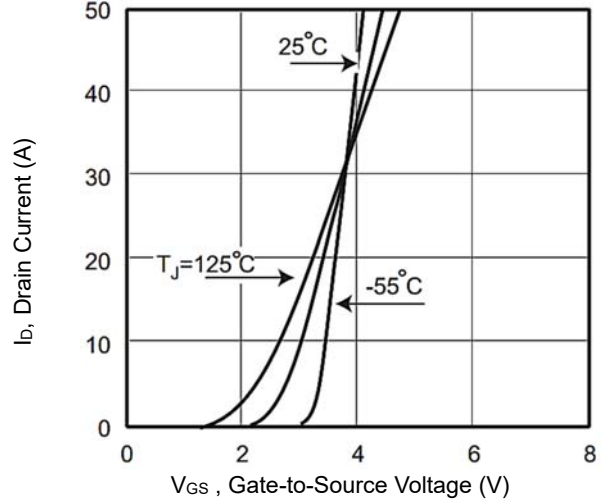
MERITEK

### CHARACTERISTICS CURVES

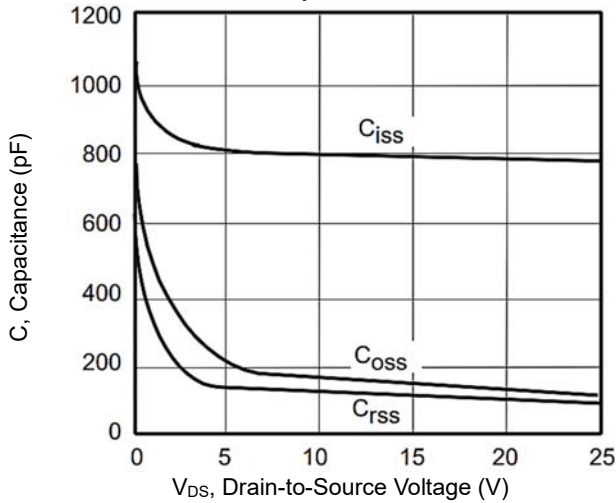
Output Characteristics



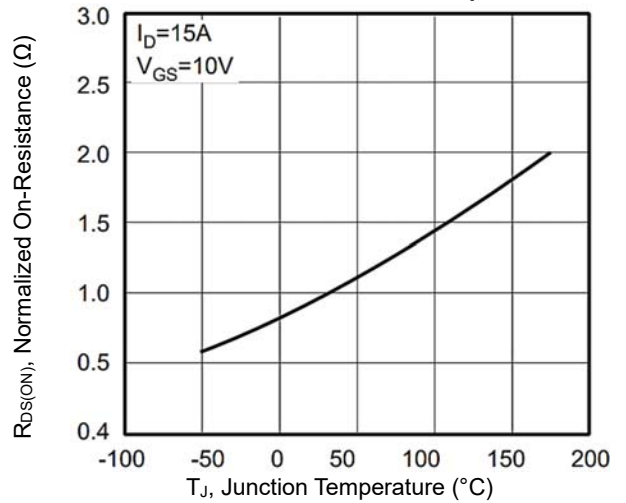
Transfer Characteristics



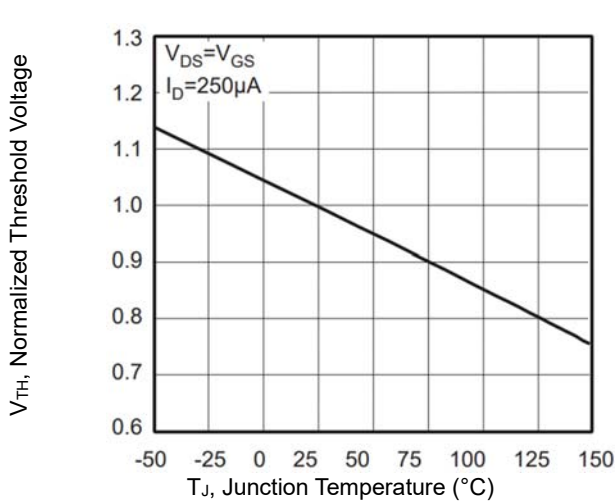
Capacitance



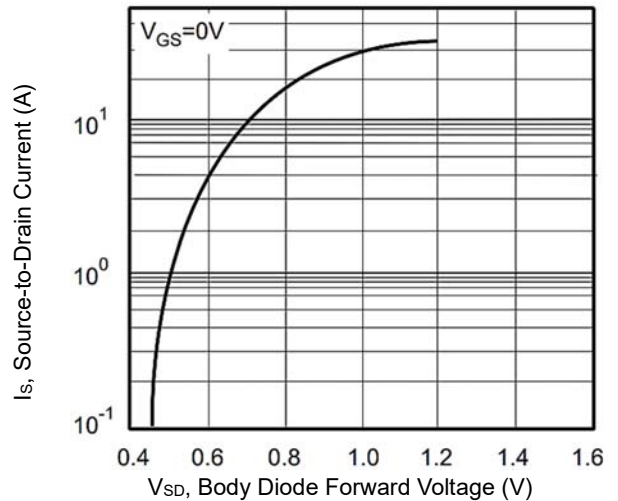
On-Resistance vs Junction Temperature



Gate Threshold Variation with Temperature



Body Diode Forward Voltage



# N-Channel MOSFET

## 60V 33A 43W TO-220

MFT6N33T220

MERITEK

### CHARACTERISTICS CURVES

