P-Channel MOSFET
100V 15A 46W DFN3X3

MFT10P15D33

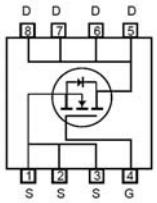
MERITEK

FEATURE

- Low On-Resistance
- Low Gate Charge
- Fast Switching Characteristics

MECHANICAL DATA

- Case: Molded Plastic, DFN3X3
- Terminal: Solderable per MIL-STD-750, Method 2026



RoHS

MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-100	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current – Continuous	V_{GS}=-10V, T_C=25°C	I_D	-15	A
	V_{GS}=-10V, T_C=100°C		-9.5	A
	V_{GS}=-10V, T_A=25°C		-2.7	A
	V_{GS}=-10V, T_A=70°C		-2.2	A
Drain Current – Pulsed		I_{DM}	-60	A
Continuous Body Diode Forward Current	T_C=25°C	I_S	-15	A
Avalanche Current	L=0.1mH	I_{AS}	-19	A
Avalanche Energy	L=0.5mH	E_{AS}	30	mJ
Total Power Dissipation	T_C=25°C	P_D	46	W
	T_C=100°C		18	W
	T_A=25°C		1.6	W
	T_A=70°C		1	W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	2.7	°C/W
Thermal Resistance, Junction to Ambient		$R_{\theta JA}$	80	°C/W
Operating and Storage Temperature		T_J, T_{STG}	-55 to 150	°C

Note:
1. The Power Dissipation P_D is based on T_J(MAX)=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in^2 FR-4 Board with 2 oz copper in a still air environment with T_A=25°C. The Power Dissipation P_D is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design
3. Repetitve rating, pulse width by junction temperature $T_{J(MAX)}$=150°C. Rating are based on low frequency and low duty cycles to keep initial T_J=25°C
4. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤2%
5. Independent of operating temperature

P-Channel MOSFET
100V 15A 46W DFN3X3

MFT10P15D33

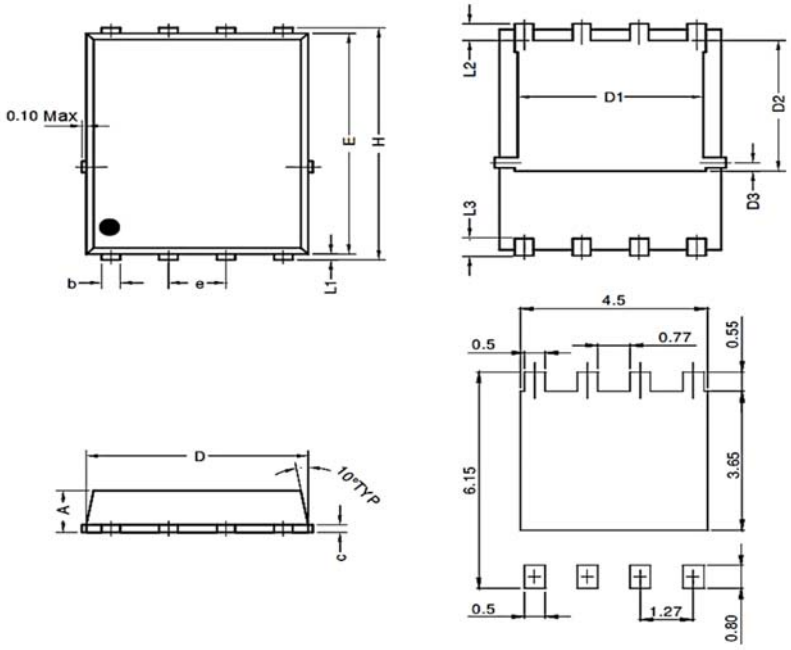
MERITEK

ELECTRICAL CHARACTERISTICS

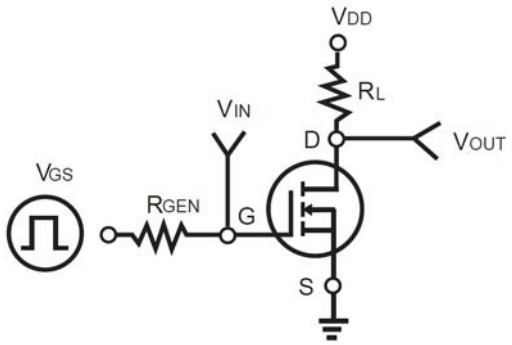
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250μA	BV_{DSS}	-100	--	--	V
Gate Leakage Current	V_{DS}=0V, V_{GS}=±20V	I_{GSS}	--	--	±100	nA
Zero Gate Voltage Drain Current	V_{DS}=-80V , V_{GS}=0V	I_{DSS}	--	--	-1	μA
Forward Transconductance	V_{DS}=-5V, I_D=-3A	G_{FS}	--	7.6	--	S
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=-250μA	$V_{GS(th)}$	-2	--	-4	V
Drain-Source On-Resistance	V_{GS}=-10V , I_D=-3A	$R_{DS(ON)}$	--	75	105	mΩ
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}=-50V, V_{GS}=-10V, I_D=-3A	Q_g	--	22	--	nC
Gate-Source Charge		Q_{gs}	--	6	--	
Gate-Drain Charge		Q_{gd}	--	5.5	--	
Turn-On Delay Time	V_{DS}=-50V, R_{GEN}=6Ω I_D=-3A, V_{GS}=-10V	$T_{d(on)}$	--	15	--	nS
Turn-On Rise Time		T_r	--	23	--	
Turn-Off Delay Time		$T_{d(off)}$	--	43	--	
Turn-Off Fall Time		T_f	--	15	--	
Input Capacitance	V_{DS}=-50V, V_{GS}=0V f=1.0MHz	C_{iss}	--	1240	--	pF
Output Capacitance		C_{oss}	--	80	--	
Reverse Transfer Capacitance		C_{rss}	--	54	--	
Gate Resistance	f=1MHz	R_g	--	5.7	--	Ω
Drain-Source Diode Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Drain-Source Diode Forward Voltage	I_S=-3A,V_{GS}=0V	V_{SD}	--	-0.78	-1.2	V
Reverse Recovery Time	I_F=-3A, dI_F/dt=100A/μs	trr	--	27	--	ns
Reverse Recovery Charge		Qrr	--	33	--	nC

DIMENSIONS

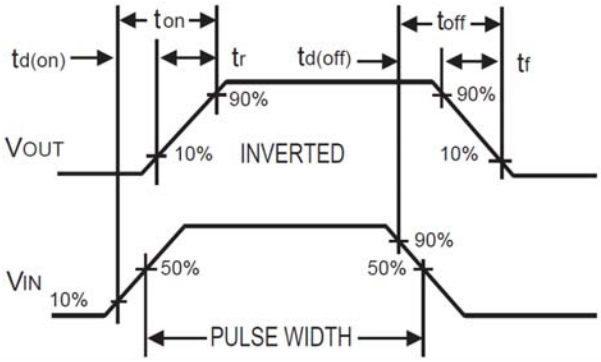
Item	Min (mm)	Max (mm)
A	0.65	0.85
b	0.20	0.40
c	0.152	
D	2.90	3.20
D1	2.30	2.60
D2	3.18	3.78
D3	1.48	1.94
E	2.90	3.20
e	0.55	0.75
H	3.15	3.45
L1	0.00	0.05
L2	0.30	0.52
L3	0.30	0.50



Switching Test Circuit

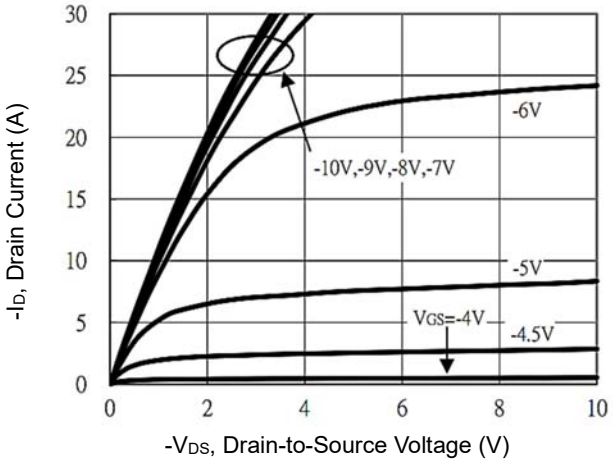


Switching Waveforms

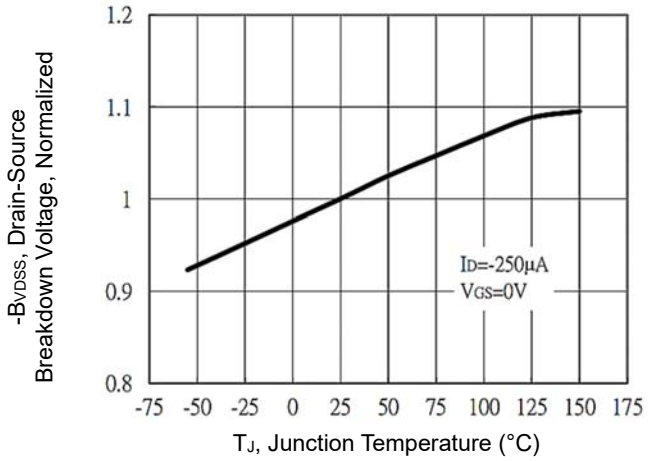


CHARACTERISTIC CURVES

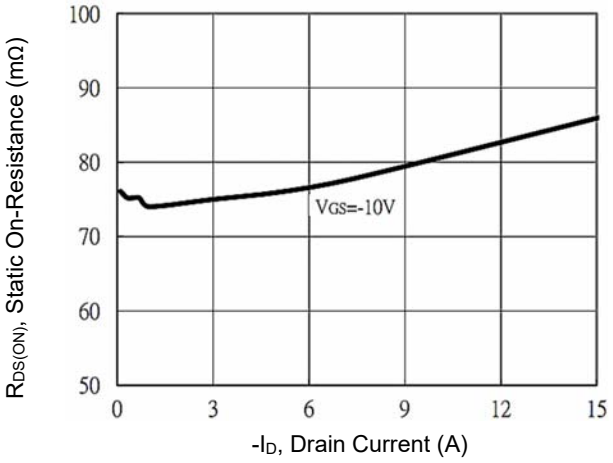
Typical Output Characteristics



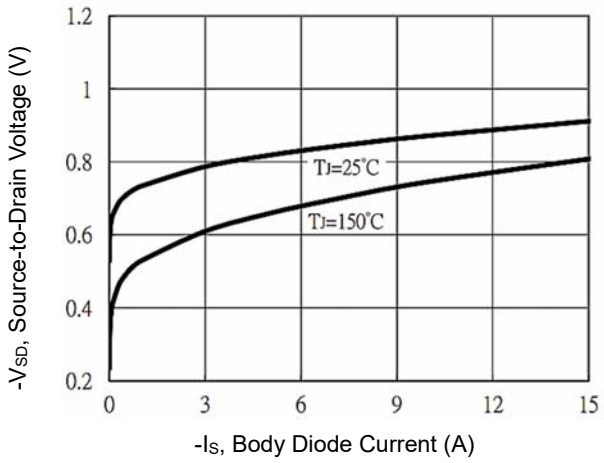
Breakdown Voltage vs. Ambient Temperature



Static On-Resistance vs. Drain Current

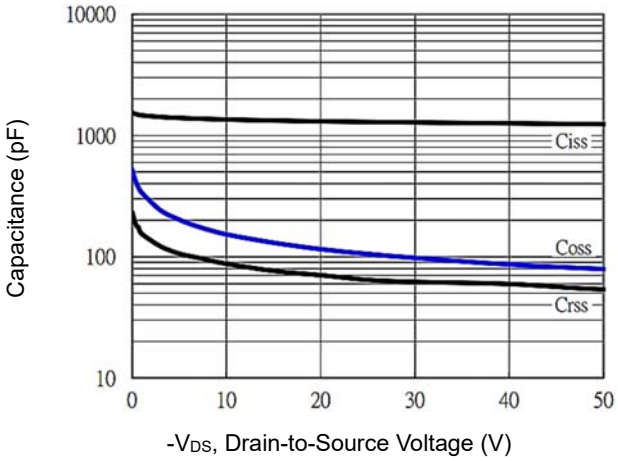


Body Diode Current vs. Source-Drain Voltage

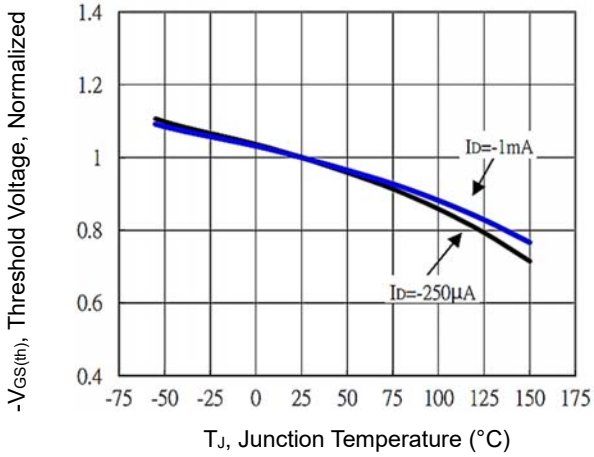


CHARACTERISTIC CURVES

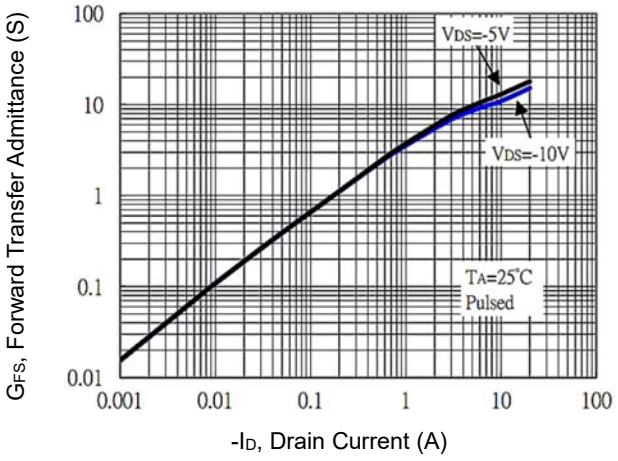
Capacitance vs. Drain-to-Source Voltage



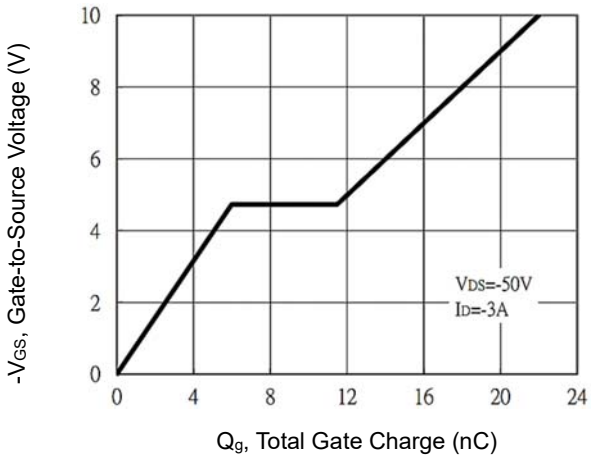
Threshold Voltage vs. Junction Temperature



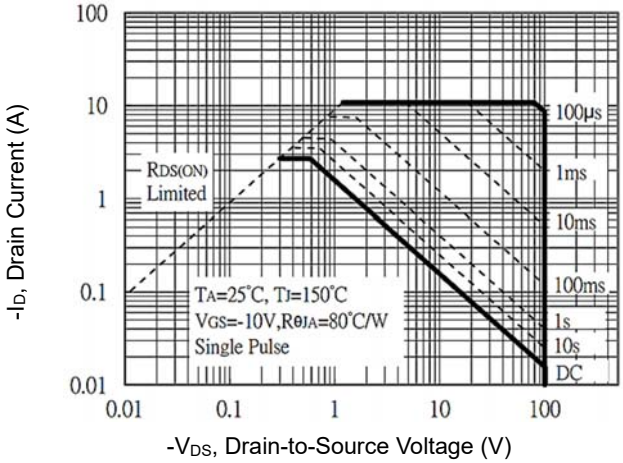
Forward Transfer Admittance vs. Drain Current



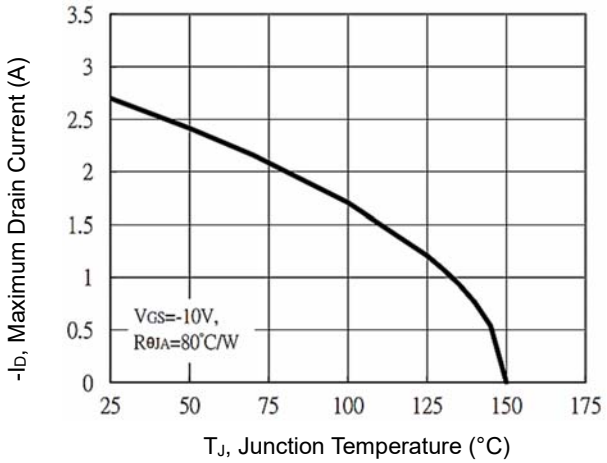
Gate Charge Characteristics



Maximum Safe Operating Area

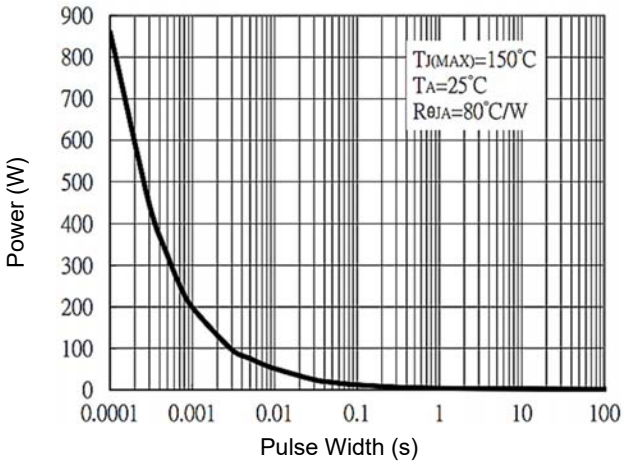


Maximum Drain Current vs. Junction Temperature

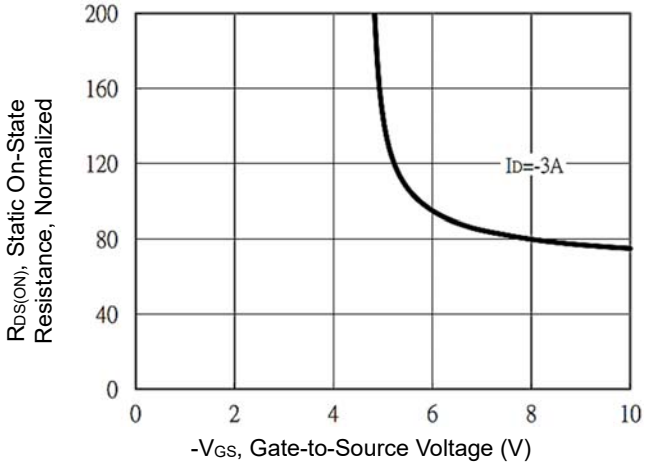


CHARACTERISTIC CURVES

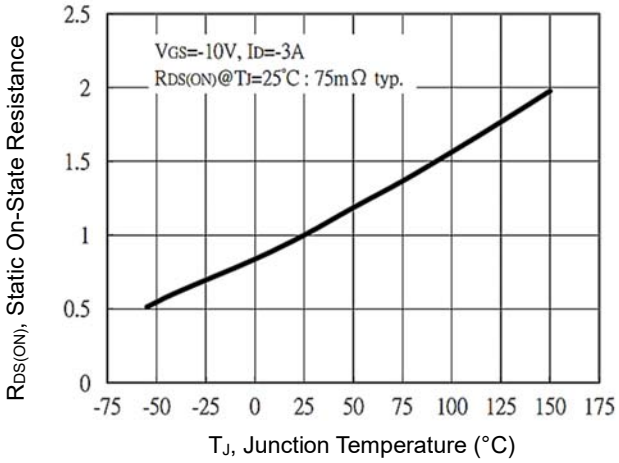
Single Pulse Power Rating, Junction to Ambient



Static On-Resistance vs. Gate-to-Source Voltage



On-State Resistance vs. Junction Temperature



Transient Thermal Response Curves