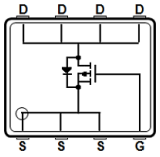
P-Channel MOSFET
100V 30A 54W DFN3x3-8L

MFT10P30D33

MERITEK

FEATURE

- $R_{DS(ON)}$<120mΩ, V_{GS}=-10V, I_D=-10A
- $R_{DS(ON)}$<125mΩ, V_{GS}=-4.5V, I_D=-8A
- High Density Cell Design for Low $R_{DS(ON)}$
- Application: DC/DC Converter, High-Frequency Switching and Synchronous Rectification



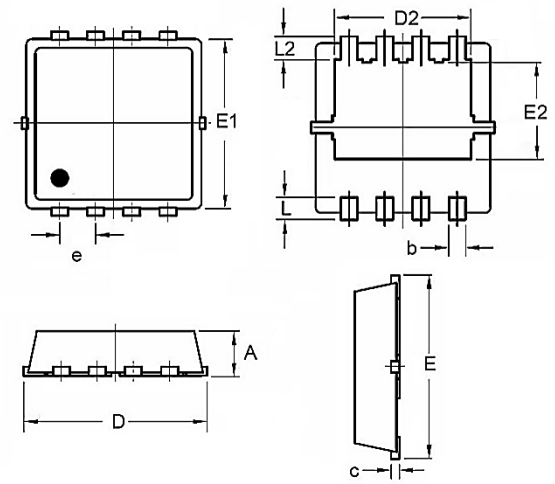
RoHS

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	-30	A
	V_{GS}=-10V, T_C= 100°C		-18	
Drain Current – Pulsed		I_{DM}	-90	A
Power Dissipation		P_D	54	W
Single Pulse Avalanche Energy		E_{AS}	157.2	mJ
Thermal Resistance Junction to Case		$R_{\theta JC}$	2.3	°C/W
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 to +150	°C

DIMENSIONS

Item	Min. (mm)	Max. (mm)
A	0.70	0.85
b	0.20	0.40
c	0.10	0.25
D	3.15	3.45
D2	2.29	2.65
e	0.60	0.70
E	3.15	3.45
E1	2.90	3.20
E2	1.54	1.94
L	0.30	0.50
L2	0.28	0.65

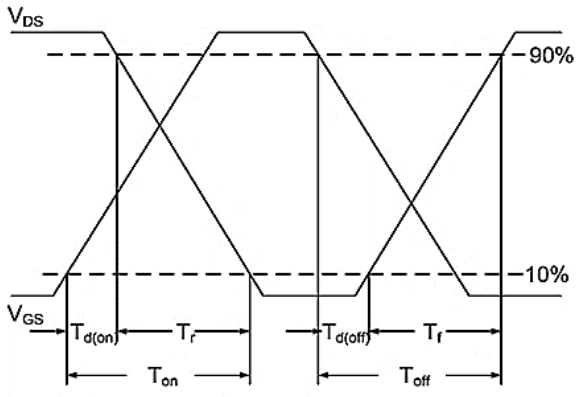


ELECTRICAL CHARACTERISTICS

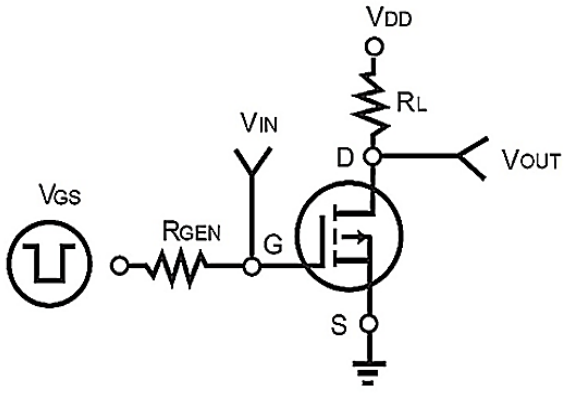
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	BV_{DSS}	-100	--	--	V
Zero Gate Voltage Drain Current	V_{DS}=-100V, V_{GS}=0V	I_{DSS}	--	--	-50	μA
Gate-Body Leakage Current	V_{DS}=0V, V_{GS}=±20V	I_{GSS}	--	--	±100	nA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}=-10V, I_D=-10A	$R_{DS(ON)}$	--	85	120	mΩ
	V_{GS}=-4.5V, I_D=-8A		--	95	125	
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=-250μA	$V_{GS(th)}$	-1.2	-1.7	-2.5	V
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}=-50V, V_{GS}=-10V, I_D=-20A	Q_g	--	44.5	--	nC
Gate-Source Charge		Q_{gs}	--	9.13	--	
Gate-Drain Charge		Q_{gd}	--	5.93	--	
Turn-On Delay Time	V_{DS}=-50V, V_{GS}=-10V, R_G=3.3Ω, I_D=-10A	$T_{d(on)}$	--	12	--	nS
Rise Time		T_r	--	27.4	--	
Turn-Off Delay Time		$T_{d(off)}$	--	79	--	
Fall Time		T_f	--	53.6	--	
Input Capacitance	V_{DS}=-20V, V_{GS}=0V, f=1MHz	C_{iss}	--	3029	--	pF
Output Capacitance		C_{oss}	--	129	--	
Reverse Transfer Capacitance		C_{rss}	--	76	--	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Forward Current	V_D=V_G=0V, Force Current	I_S	--	--	-30	A
Diode Forward Voltage	V_{GS}=0V, I_S=-1A	V_{SD}	--	--	-1.2	V
Reverse Recovery Time	I_F=-8A, di/dt=100A/μs	t_{rr}	--	38.7	--	nS
Reverse Recovery Charge		Q_{rr}	--	22.4	--	nC

Note:
1. T_C=25°C unless otherwise noted.
2. The data tested by surface mounted on a 1-inch square FR-4 board with 2oz copper.
3. The data tested by pulsed, pulse width≤300μs, duty cycle≤2%
4. EAS condition: V_{DD}=-72V, V_G=-10V, L=0.1mH, I_{AS}=-19A.
5. P_D is based on max. junction temperature.
6. Guaranteed by design, not subject to production testing.

Switching Time Waveform

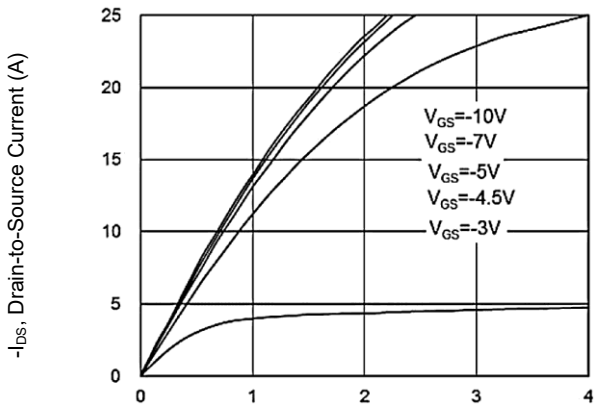


Switching Test Circuit

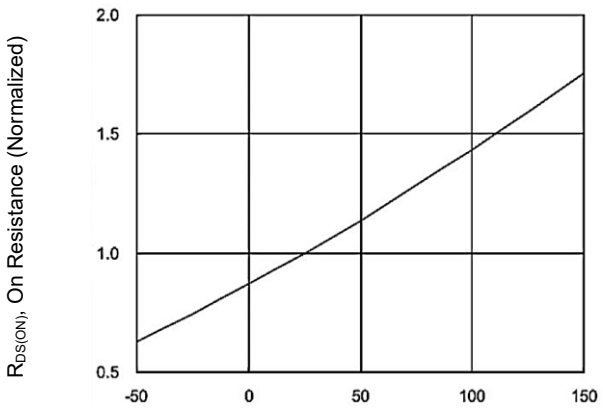


CHARACTERISTIC CURVES

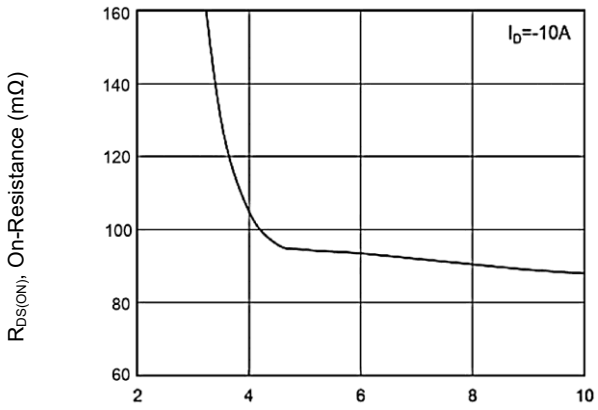
Output Characteristics



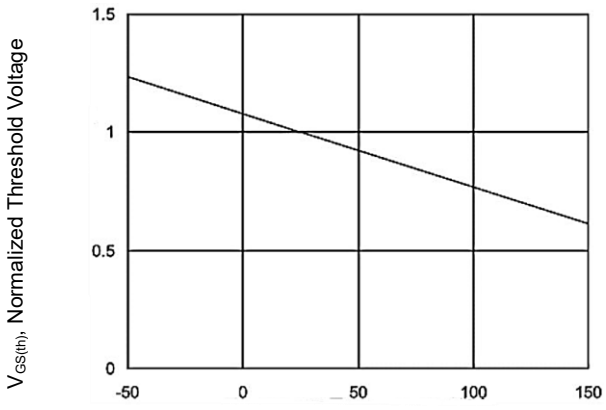
On-Resistance vs. Temperature



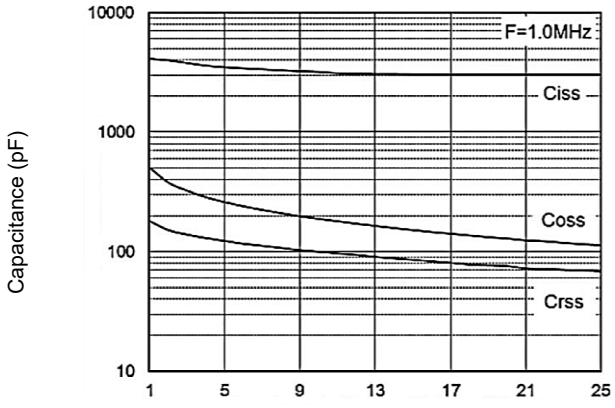
On-Resistance vs. Gate-to-Source Voltage



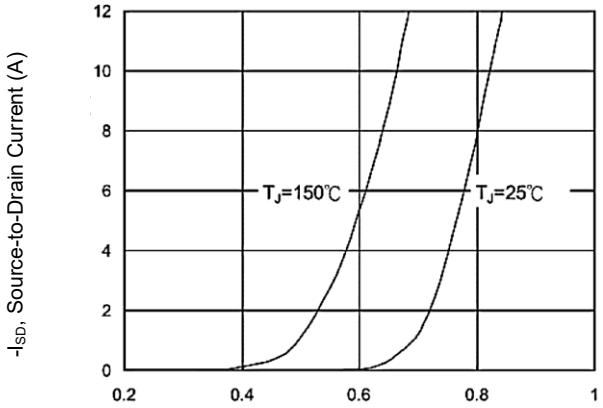
Threshold Voltage vs. Temperature



Capacitance

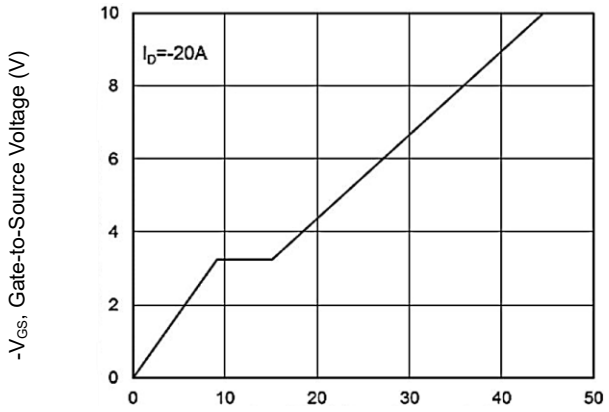


Body Diode Characteristics

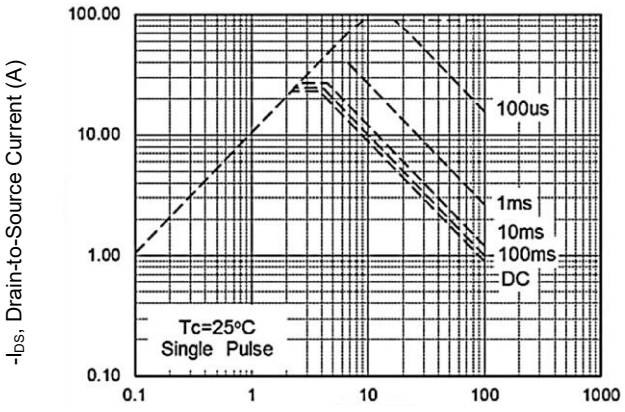


CHARACTERISTIC CURVES

Gate Charge Characteristics



Maximum Safe Operating Area



Normalized Transient Thermal Impedance