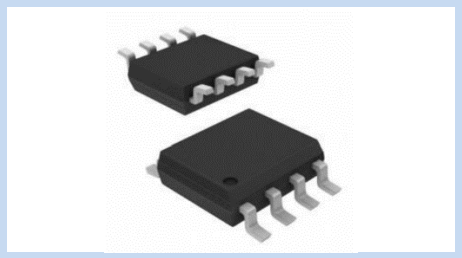
N Channel MOSFET
30V 20A 13W SOP-8

MFT3N20S8

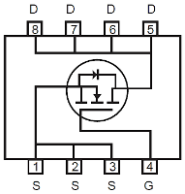
MERITEK

FEATURE



- $R_{DS(ON)}$<5.5mΩ, V_{GS}=10V, I_D=10A
- $R_{DS(ON)}$<8mΩ, V_{GS}=4.5V, I_D=8A
- Advanced Trench Process Technology
- Low Gate Charge
- Fast Switching Characteristic

MECHANICAL DATA



RoHS

- Case: SOP-8 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current – Continuous	T_C= 25°C	I_D	31	A
	T_C= 100°C		20	
Drain Current – Continuous	T_A= 25°C		12	
	T_A= 100°C		9.6	
Drain Current – Pulsed		I_{DM}	80	A
Continuous Body Diode Forward Current	T_A= 25°C	I_S	10	A
Avalanche Current	L=0.1mH	I_{AS}	21	A
Avalanche Energy	L=0.5mH	E_{AS}	110	mJ
Power Dissipation	T_C= 25°C	P_D	13	W
	T_C= 100°C		5.2	
Power Dissipation	T_A= 25°C		2	
	T_A= 70°C		1.3	
Thermal Resistance Junction to Ambient		$R_{\theta JA}$	64	°C/W
Thermal Resistance Junction to Case		$R_{\theta JC}$	9.8	
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 to +150	°C

Note:

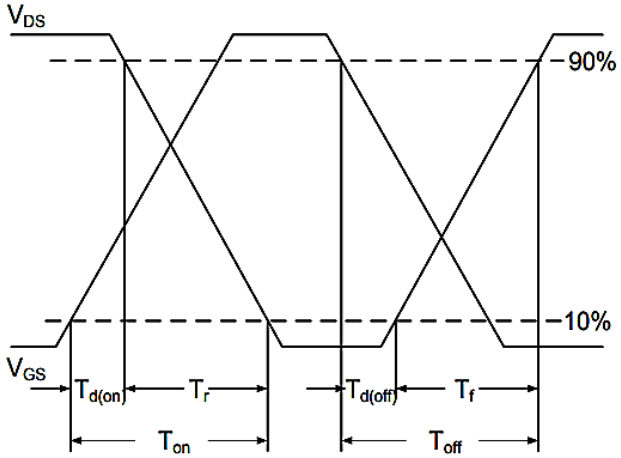
1. The power dissipation P_D is based on $T_{J(MAX)}$ =150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in² FR-4 board with 2oz. 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. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and low duty cycles to keep initial T_J=25°C.

ELECTRICAL CHARACTERISTICS

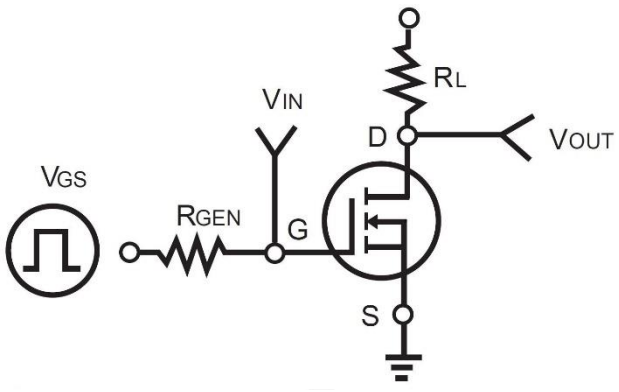
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250μA	BV_{DSS}	30	--	--	V
Drain-Source Leakage Current	V_{DS}=24V, V_{GS}=0V,	I_{DSS}	--	--	1	μA
Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	--	--	±100	nA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}=10V, I_D=10A	$R_{DS(ON)}$	--	4.2	5.5	mΩ
	V_{GS}=4.5V, I_D=8A		--	5.5	8	
Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250μA	$V_{GS(th)}$	1.0	--	2.5	V
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}=15V, V_{GS}=-10V, I_D=10A	Q_g	--	45	--	nC
Gate-Source Charge		Q_{gs}	--	6	--	
Gate-Drain Charge		Q_{gd}	--	10	--	
Turn-On Delay Time	V_{DS}=15V, V_{GS}=10V, R_{GS}=6Ω, I_D=1A	$T_{d(on)}$	--	15	--	ns
Rise Time		T_r	--	20	--	
Turn-Off Delay Time		$T_{d(off)}$	--	70	--	
Fall Time		T_f	--	18	--	
Input Capacitance	V_{DS}=15V, V_{GS}=0V, F=1MHz	C_{iss}	--	2000	--	pF
Output Capacitance		C_{oss}	--	250	--	
Reverse Transfer Capacitance		C_{rss}	--	200	--	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Forward Voltage	V_{GS}=0V , I_S=10A , T_J=25°C	V_{SD}	--	0.79	1.2	V
Reverse Recovery Time	I_D=4A, di/dt=100A/μs	T_{rr}	--	15	--	ns
Reverse Recovery Charge		Q_{rr}	--	7.5	--	nC

Note:
1. Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
2. Independent of operating temperature

Switching Time Waveform

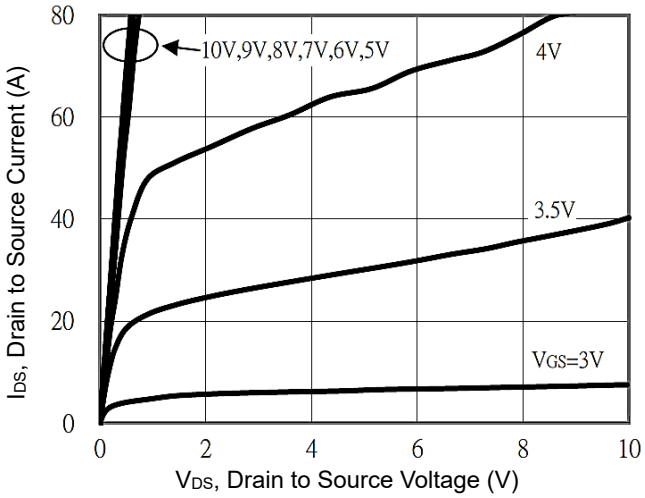


Switching Test Circuit

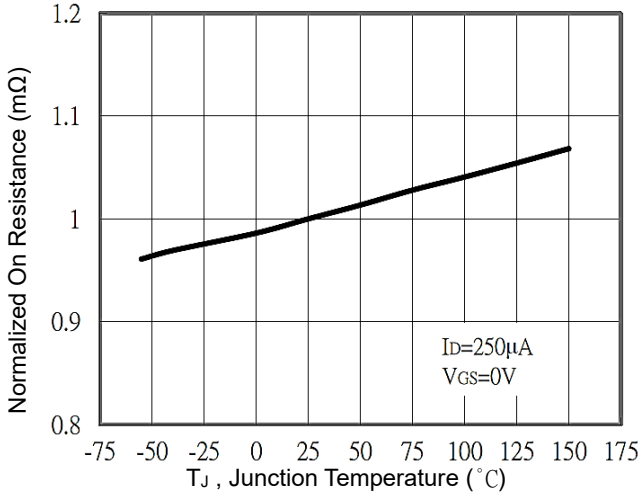


CHARACTERISTIC CURVES

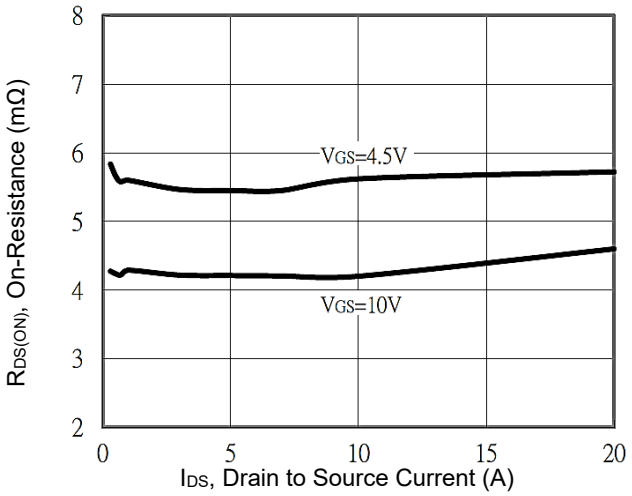
On-Region Characteristics



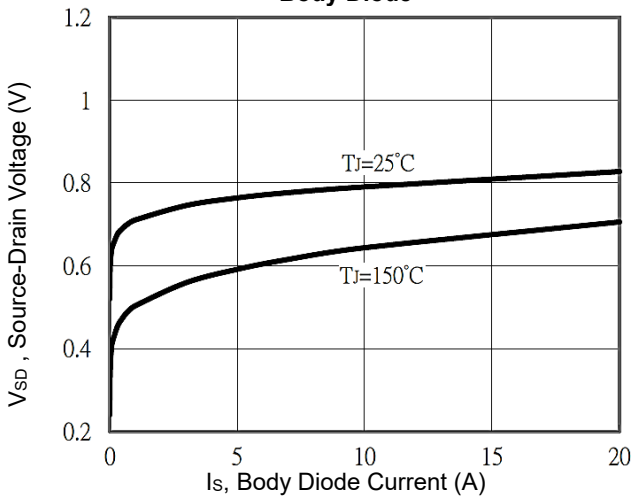
Breakdown Voltage vs. T_J



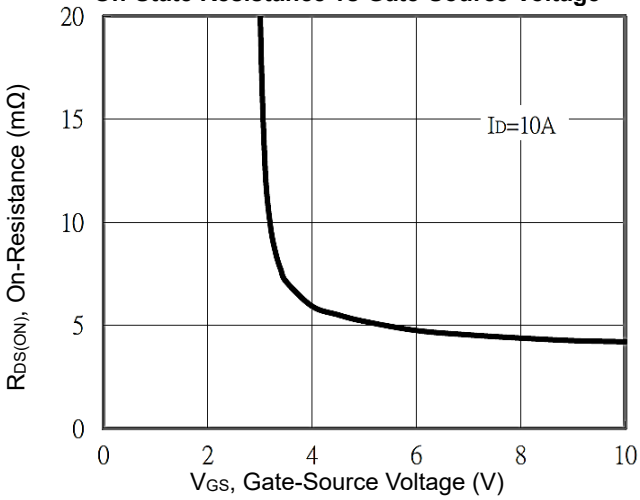
On-Resistance vs Drain Current



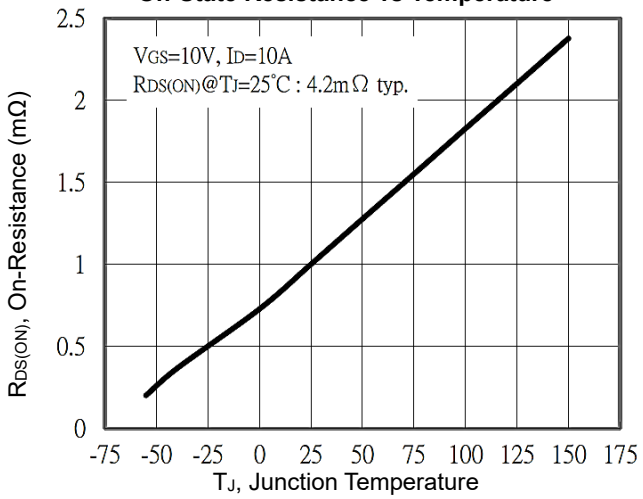
Body Diode



On-State Resistance vs Gate-Source Voltage

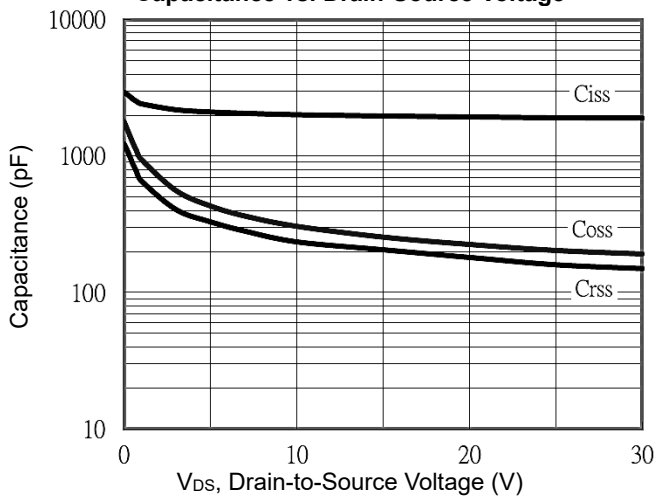


On-State Resistance vs Temperature

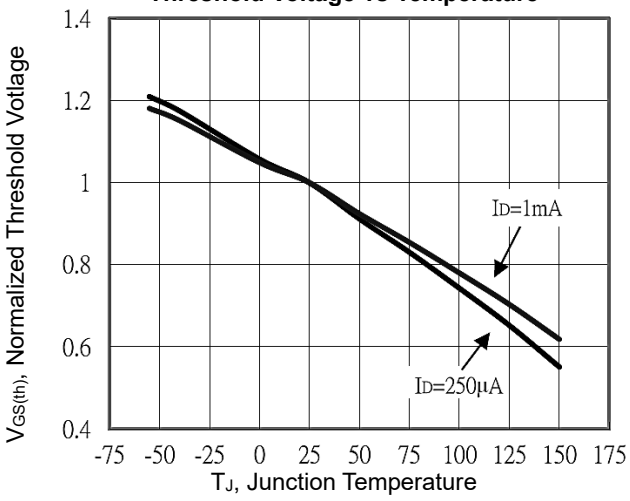


CHARACTERISTIC CURVES

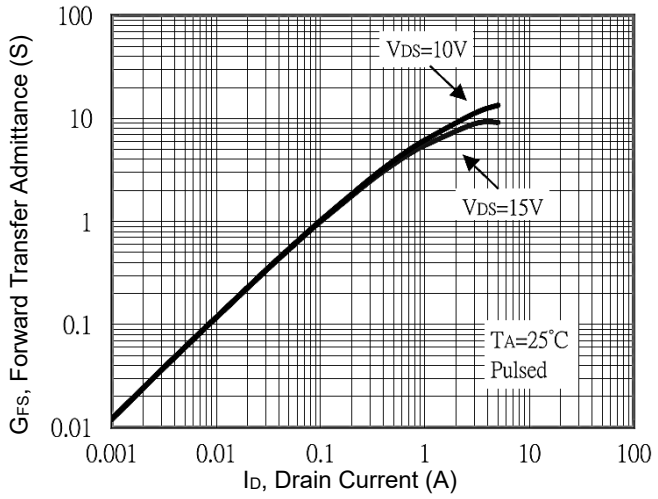
Capacitance vs. Drain-Source Voltage



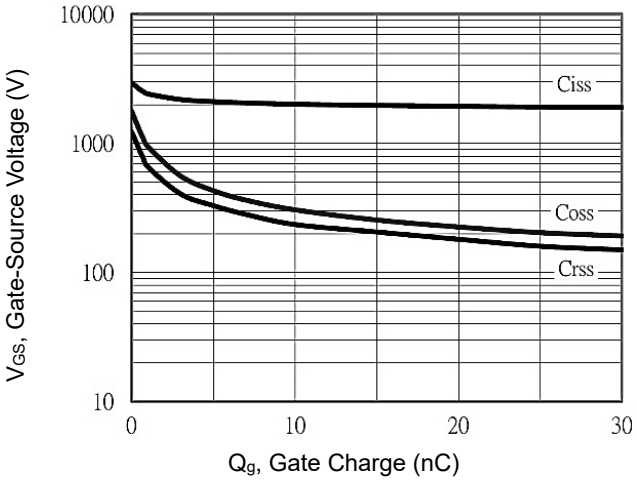
Threshold Voltage vs Temperature



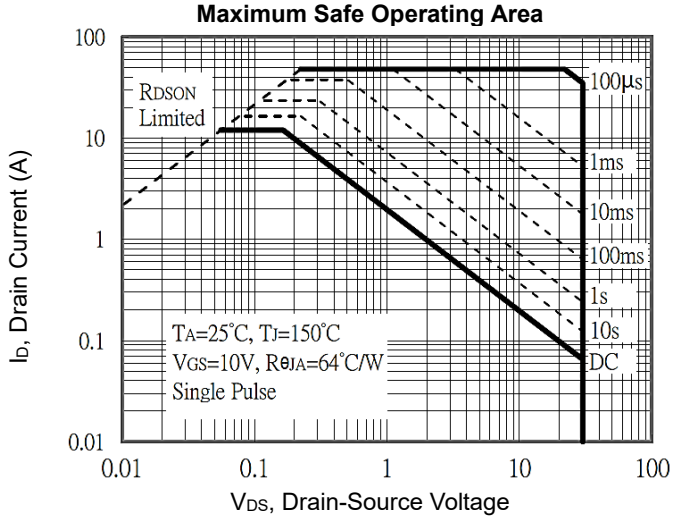
Forward Transfer Admittance vs Drain Current



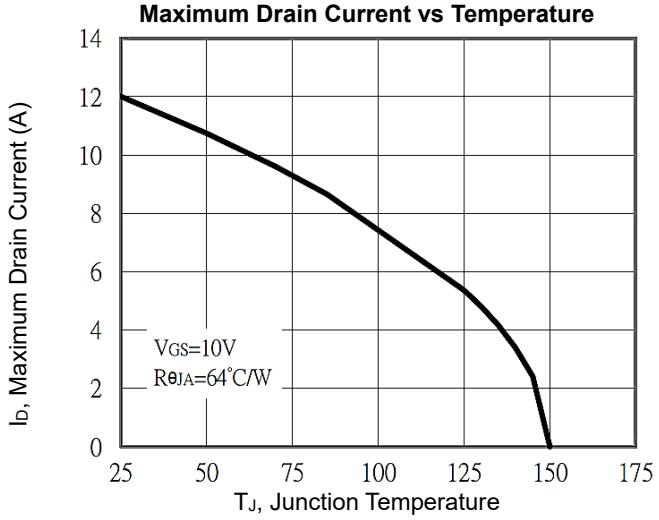
Gate Charge



Maximum Safe Operating Area

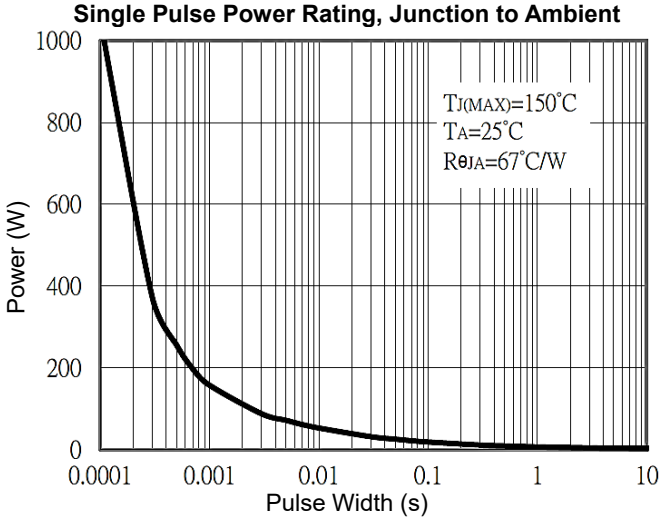


Maximum Drain Current vs Temperature

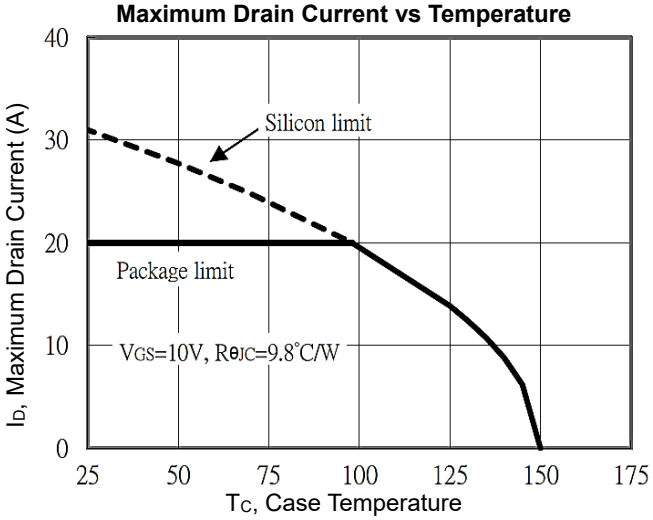


CHARACTERISTIC CURVES

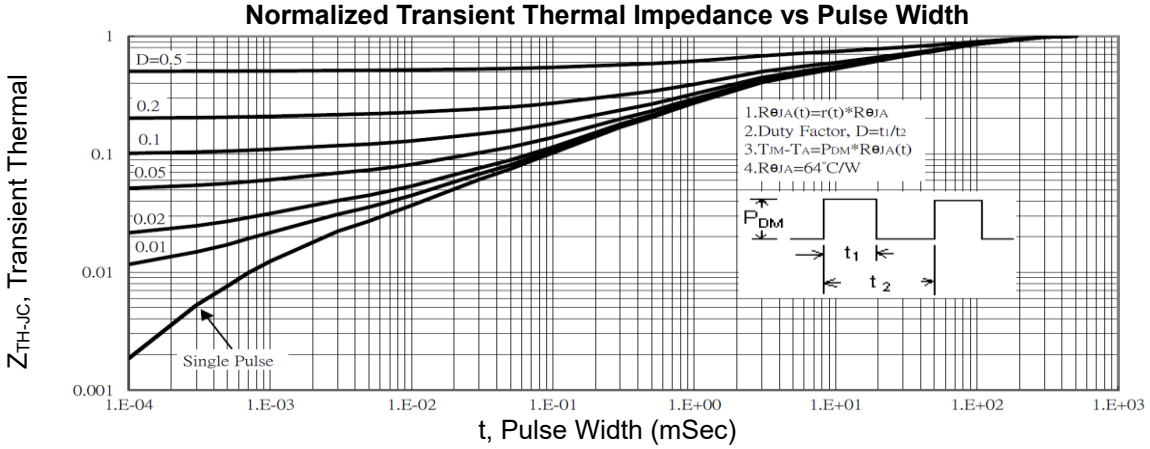
Single Pulse Power Rating, Junction to Ambient



Maximum Drain Current vs Temperature



Normalized Transient Thermal Impedance vs Pulse Width



DIMENSIONS

Item	Min (mm)	Max (mm)
A1	0.10	0.25
A2	1.35	1.75
A3	1.45	2.00
b	0.31	0.51
c	0.17	0.25
D	4.69	5.00
e	1.27 BSC	
e1	2.54	2.54
E	5.80	6.20
E1	3.70	4.06
L	0.40	0.95
Y	1.00	1.00
Y1	6.75	6.75
X	0.50	0.50
X1	3.81	3.81
C	1.27	1.27