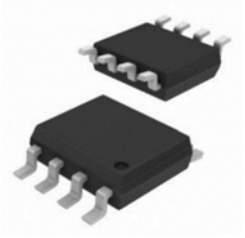
P Channel MOSFET
60V 20A 13W SOP-8

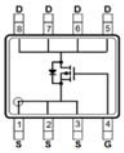
MFT6P20S8

MERITEK

FEATURE

- $R_{DS(ON)}$<26mΩ, V_{GS}=-10V, I_D=-10A
- Low On Resistance
- Advanced Trench Process Technology
- Low Gate Charge
- Fast Switching Characteristic





RoHS

MECHANICAL DATA

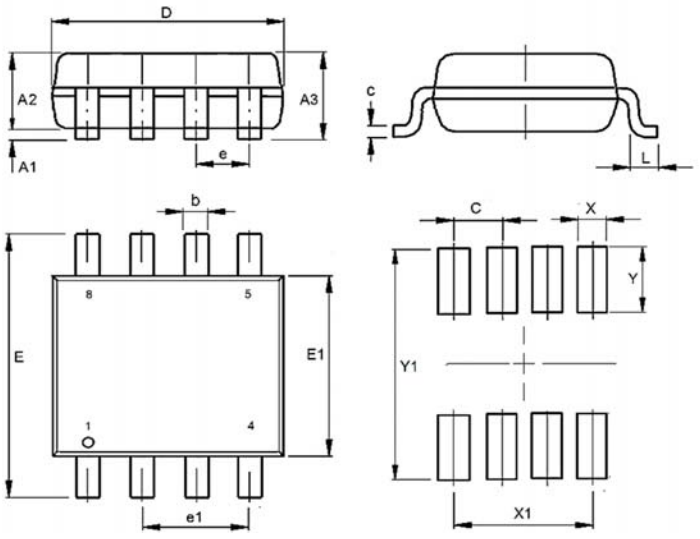
- Case: SOP-8 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	±20	
Drain Current – Continuous	V_{GS}=-10V ,T_C= 25°C	I_D	-20	A
	V_{GS}=-10V ,T_C= 100°C		-13	
	V_{GS}=-10V ,T_A= 25°C		-8	
	V_{GS}=-10V ,T_A= 70°C		-6	
Drain Current – Pulsed		I_{DM}	-80	
Continuous Body Diode Forward Current	T_C= 25°C	I_S	-14	
Avalanche Current	L=0.1mH	I_{AS}	-35	
Avalanche Energy	L=0.5mH	E_{AS}	100	mJ
Power Dissipation	T_C= 25°C	P_D	17	W
	T_C= 100°C		6.8	
	T_A= 25°C	P_D	2.8	
	T_A= 70°C		1.8	
Thermal Resistance Junction to Ambient		$R_{\theta JA}$	45	°C/W
Thermal Resistance Junction to Case		$R_{\theta JC}$	7.3	
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

DIMENSIONS

SOP-8	Min (mm)	Max (mm)
A1	0.10	0.25
A2	1.35	1.55
A3	1.35	1.75
b	0.33	0.51
c	0.17	0.25
D	4.70	5.10
E	5.80	6.20
E1	3.80	4.00
e	1.27	
L	0.40	1.27
X	0.60	
X1	3.81	
Y	1.52	
Y1	7.00	
C	1.27	



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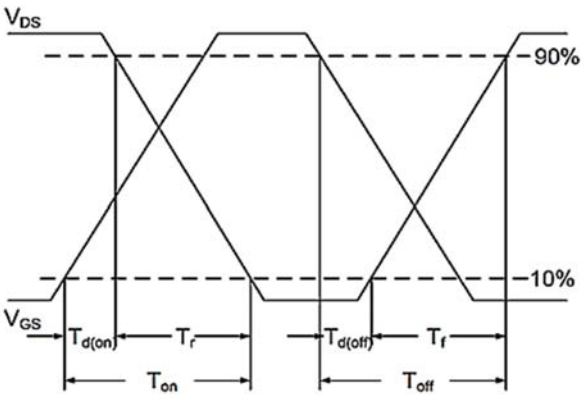
ELECTRICAL CHARACTERISTICS

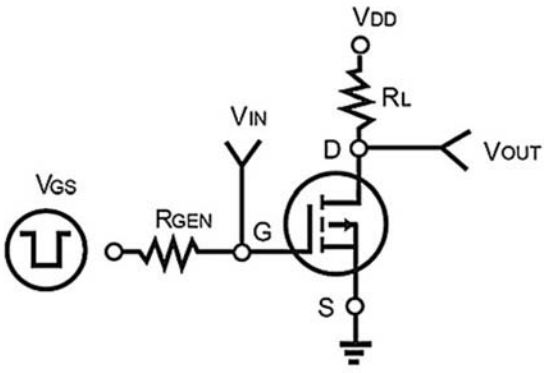
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250μA	BV_{DSS}	-60	-	-	V
Drain-Source Leakage Current	V_{DS}=-48V, V_{GS}=0V,	I_{DSS}	-	-	-1	μA
Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	-	-	±100	nA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}=-10V, I_D=-10A	$R_{DS(ON)}$	-	20	26	mΩ
Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=-250μA	$V_{GS(th)}$	-2	-	-4	V
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}=-30V, V_{GS}=-10V, I_D=-10A	Q_g	-	36	-	nC
Gate-Source Charge		Q_{gs}	-	9	-	
Gate-Drain Charge		Q_{gd}	-	8.7	-	
Turn-On Delay Time	V_{DS}=-30V, V_{GS}=-10V, R_{GS}=1Ω, I_D=-10A	$T_{d(on)}$	-	16	-	ns
Rise Time		T_r	-	25	-	
Turn-Off Delay Time		$T_{d(off)}$	-	54	-	
Fall Time		T_f	-	19	-	
Input Capacitance	V_{DS}=-30V , V_{GS}=0V , F=1MHz	C_{iss}	-	2070	-	pF
Output Capacitance		C_{oss}	-	280	-	
Reverse Transfer Capacitance		C_{rss}	-	120	-	
Gate Resistance	F=1MHz	R_g	-	10	-	Ω
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Forward Voltage	V_{GS}=0V , I_S=-10A	V_{SD}	-	-0.79	-1.2	V
Reverse Recovery Time	I_D = -10A,di/dt = 100A/μs	T_{rr}	-	18	-	ns
Reverse Recovery Charge		Q_{rr}	-	11	-	nC

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.
4. Pulse width≤ 300μs, duty cycle≤2%; Independence of operating temperature.

Switching Time Waveform

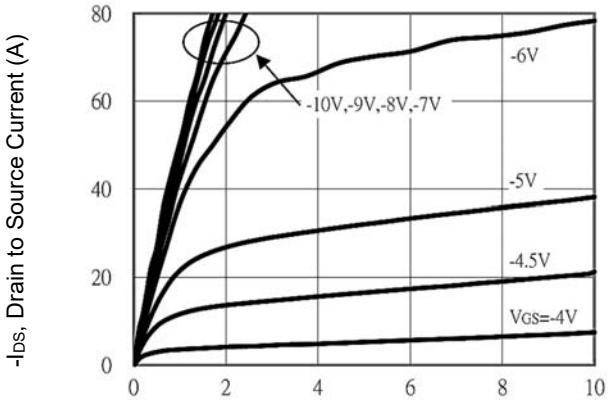


Switching Test Circuit



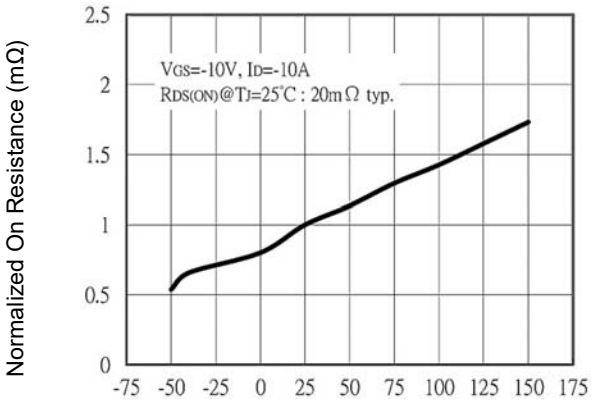
CHARACTERISTIC CURVES

On-Region Characteristics



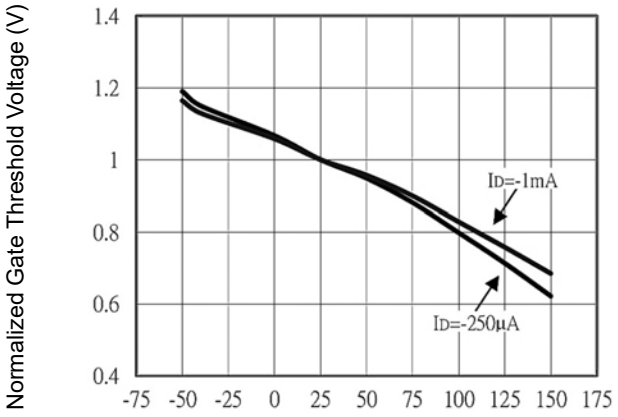
-VDS, Drain to Source Voltage (V)

Normalized RDS(ON) vs. TJ



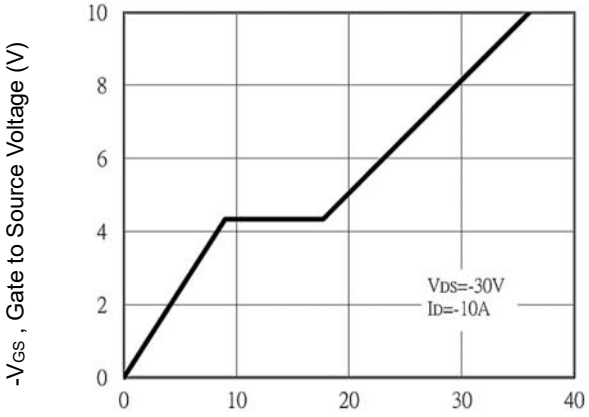
TJ, Junction Temperature (°C)

Normalized Vth vs. TJ



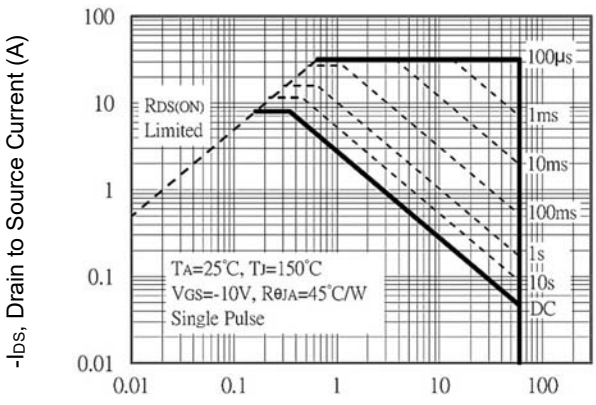
TJ, Junction Temperature (°C)

Gate Charge Waveform



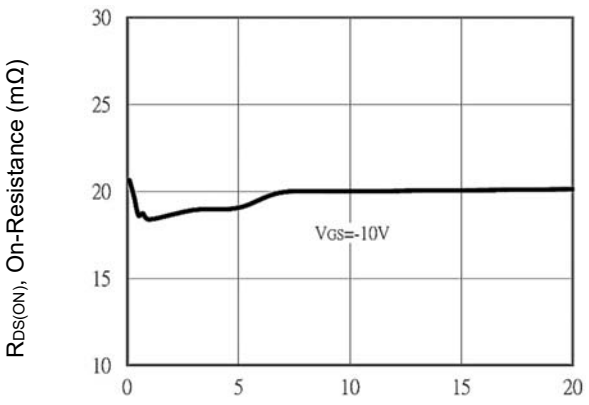
Qg , Gate Charge (nC)

Maximum Safe Operating Area



-VDS, Drain to Source Voltage (V)

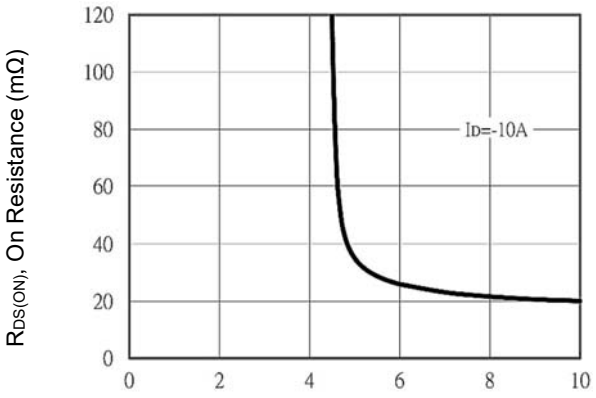
On-Resistance vs. Drain Current



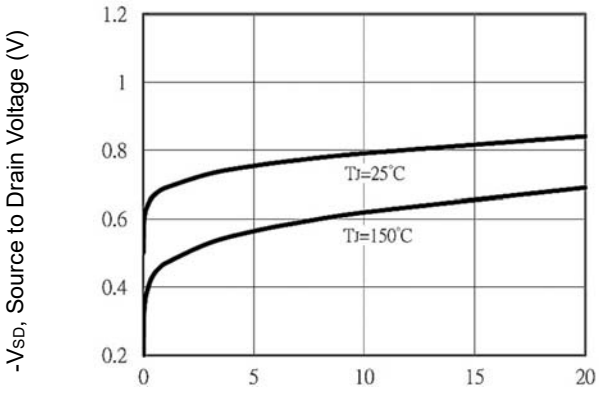
-IDS, Drain to Source Current (A)

CHARACTERISTIC CURVES

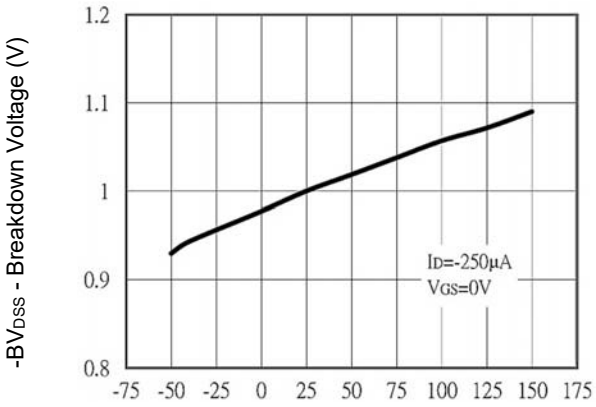
On-Resistance Variation with V_{GS}



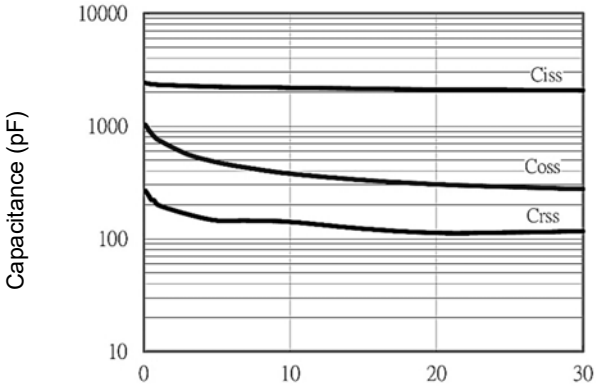
Body Diode Forward Voltage



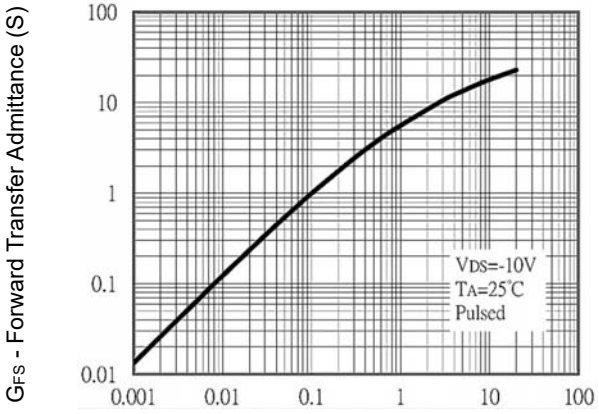
Breakdown Voltage vs Junction Temperature



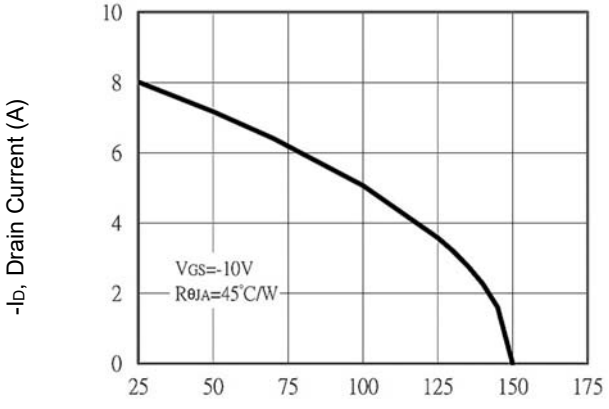
Capacitance vs. Drain-Source Voltage



Forward Transfer Admittance vs Drain Current

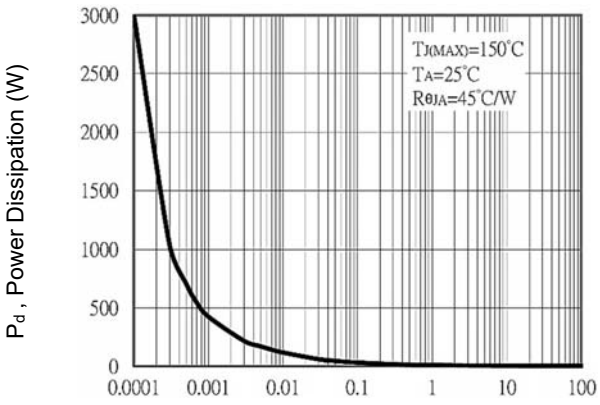


Maximum Drain Current vs Temperature



CHARACTERISTIC CURVES

Single Pulse Power Rating



Normalized Transient Thermal Impedance vs Pulse Width