

# P-Channel MOSFET

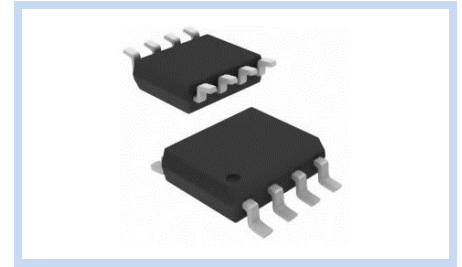
## 30V 25A 12W SOP-8

MFT3P25S8

MERITEK

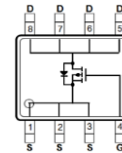
### FEATURE

- $R_{DS(ON)} < 10m\Omega$ ,  $V_{GS} = -10V$ ,  $I_D = -10A$
- $R_{DS(ON)} < 16m\Omega$ ,  $V_{GS} = -4.5V$ ,  $I_D = -8A$
- Advanced Trench Process Technology
- Low Gate Charge
- Fast Switching Characteristic



### MECHANICAL DATA

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



### MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		$V_{DS}$	-30	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	V
Drain Current – Continuous	$V_{GS} = -10V$ , $T_C = 25^\circ C$	$I_D$	-25	A
	$V_{GS} = -10V$ , $T_C = 100^\circ C$		-16	
	$V_{GS} = -10V$ , $T_A = 25^\circ C$		-11	
	$V_{GS} = -10V$ , $T_A = 70^\circ C$		-9	
Drain Current – Pulsed		$I_{DM}$	-100	A
Continuous Body Diode Forward Current	$T_C = 25^\circ C$	$I_S$	-10	A
Avalanche Current	$L = 0.1mH$	$I_{AS}$	-30	A
Avalanche Energy	$L = 0.5mH$	$E_{AS}$	64	mJ
Power Dissipation	$T_C = 25^\circ C$	$P_D$	12	W
	$T_C = 100^\circ C$		4.8	
	$T_A = 25^\circ C$		2.3	
	$T_A = 70^\circ C$		1.5	
Thermal Resistance, Junction to Ambient		$R_{\theta JA}$	55	$^\circ C/W$
Thermal Resistance, Junction to Case		$R_{\theta JC}$	10.5	
Operating Junction and Storage Temperature Range		$T_J, T_{STG}$	-55 to +150	$^\circ C$

# P-Channel MOSFET

## 30V 25A 12W SOP-8

MFT3P25S8

MERITEK

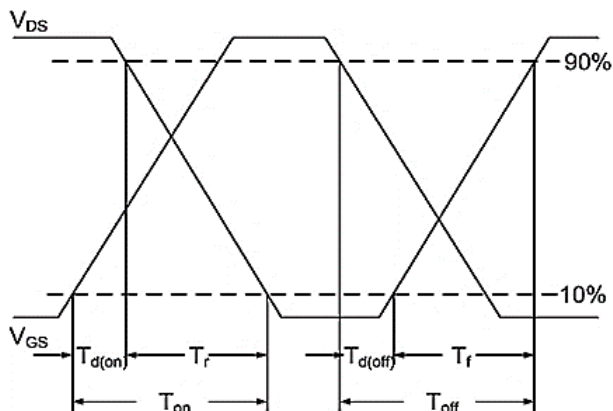
### ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	$BV_{DSS}$	-30	--	--	V
Drain-Source Leakage Current	$V_{DS}=-24V, V_{GS}=0V,$	$I_{DSS}$	--	--	-1	$\mu A$
Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	$I_{GSS}$	--	--	$\pm 100$	nA
Forward Transconductance	$V_{DS}=-10V, I_D=-10A$	$G_{FS}$	--	25	--	S
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-10A$	$R_{DS(ON)}$	--	8	10	m $\Omega$
	$V_{GS}=-4.5V, I_D=-8A$		--	12	16	
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	$V_{GS(th)}$	-1.0	--	-2.5	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Gate Resistance	$F=1MHz$	$R_g$	--	13	--	$\Omega$
Total Gate Charge	$V_{DS}=-15V, V_{GS}=-10V, I_D=-10A$	$Q_g$	--	60	--	nC
Gate-Source Charge		$Q_{gs}$	--	8	--	
Gate-Drain Charge		$Q_{gd}$	--	13	--	
Turn-On Delay Time	$V_{DS}=-15V, V_{GS}=-10V,$ $R_{GS}=3\Omega, I_D=-10A$	$T_{d(on)}$	--	12	--	ns
Rise Time		$T_r$	--	18	--	
Turn-Off Delay Time		$T_{d(off)}$	--	95	--	
Fall Time		$T_f$	--	110	--	
Input Capacitance	$V_{DS}=-15V, V_{GS}=0V,$ $F=1MHz$	$C_{iss}$	--	3000	--	pF
Output Capacitance		$C_{oss}$	--	400	--	
Reverse Transfer Capacitance		$C_{rss}$	--	320	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Voltage	$V_{GS}=0V, I_S=-10A$	$V_{SD}$	--	-0.8	-1.2	V
Reverse Recovery Time	$I_F=-10A, di_F/dt=100A/\mu s$	$T_{rr}$	--	18	--	ns
Reverse Recovery Charge		$Q_{rr}$	--	8.3	--	nC

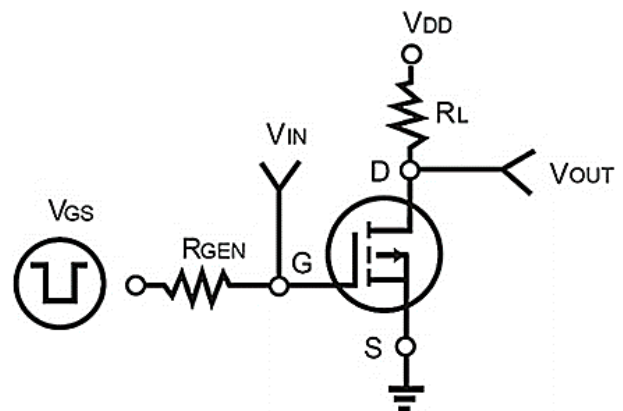
Note:

- The power dissipation  $P_D$  is based on  $T_{J(MAX)}=150^\circ C$ , using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
- The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. copper, in a still air environment with  $T_A=25^\circ C$ . The power dissipation  $P_D$  is based on  $R_{\theta JA}$  and the maximum allowed junction temperature of  $150^\circ C$ . The value in any given application depends on the user's specific board design.
- Repetitive rating, pulse width limited by junction temperature  $T_{J(MAX)}=150^\circ C$ . Ratings are based on low frequency and low duty cycles to keep initial  $T_J=25^\circ C$ .
- Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
- Essentially independent of operating temperature typical characteristics.

Switching Time Waveform



Switching Test Circuit



# P-Channel MOSFET

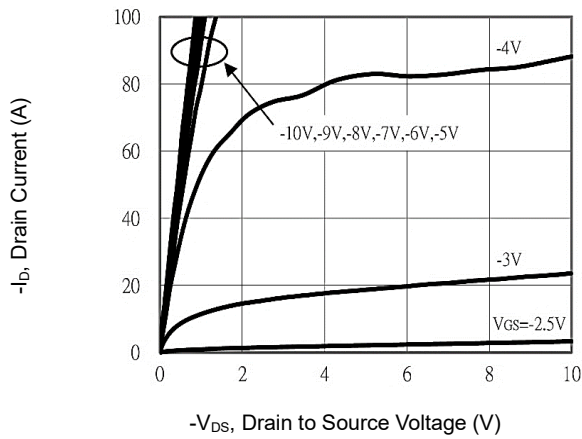
## 30V 25A 12W SOP-8

MFT3P25S8

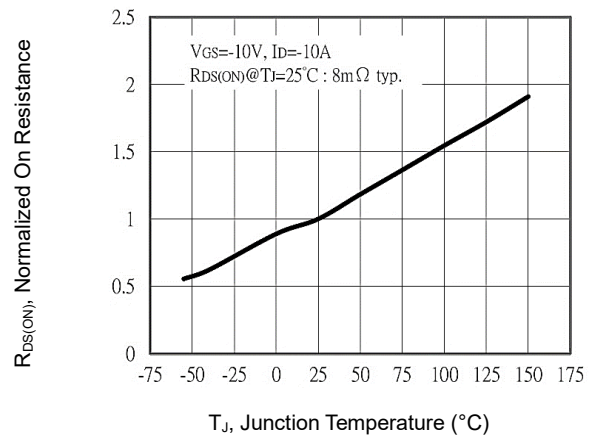
MERITEK

### CHARACTERISTIC CURVES

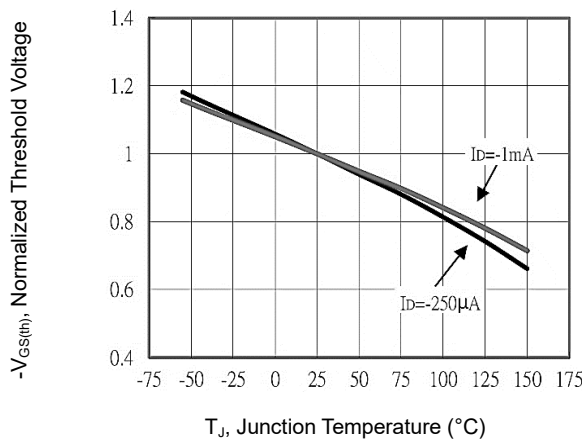
On-Region Characteristics



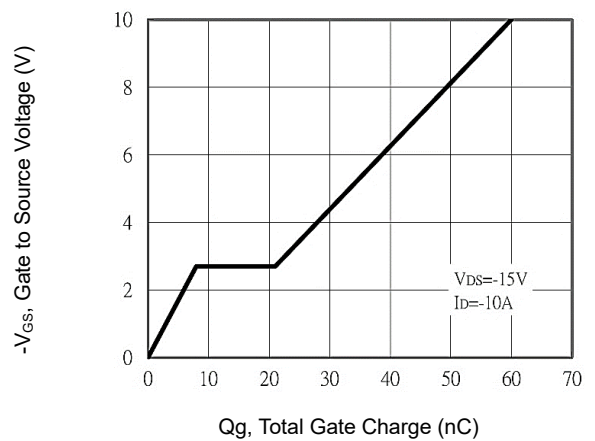
Normalized On-Resistance



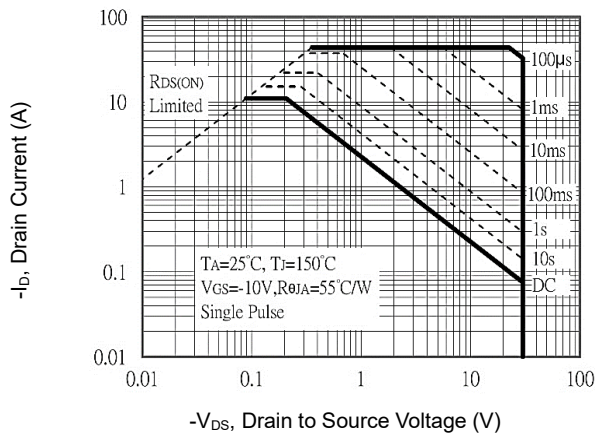
Threshold Voltage vs. Temperature



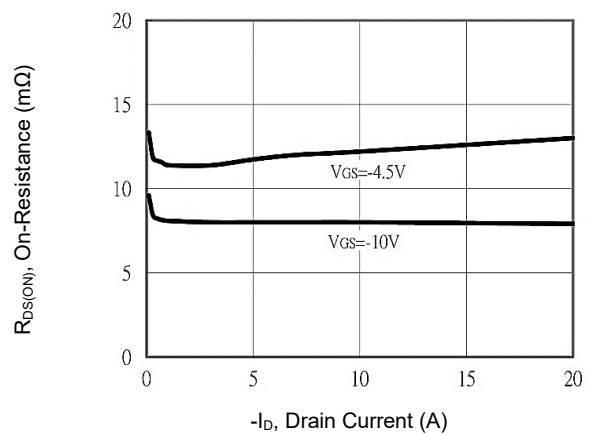
Gate Charge Characteristics



Maximum Safe Operating Area

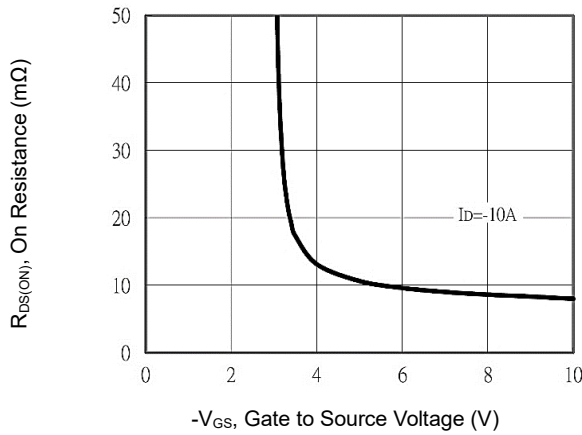


On-Resistance vs. Drain Current

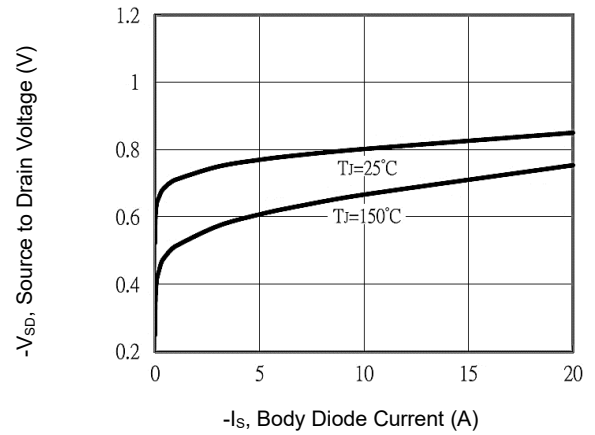


**CHARACTERISTIC CURVES**

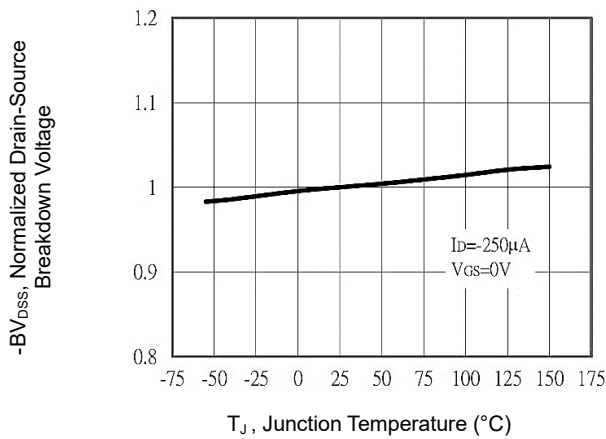
**On-Resistance Variation with  $V_{GS}$**



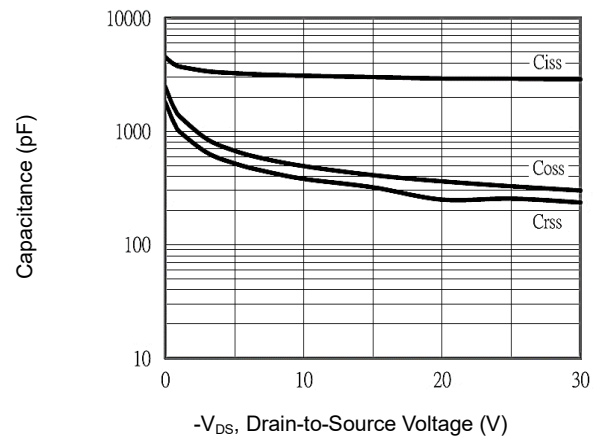
**Body Diode Characteristics**



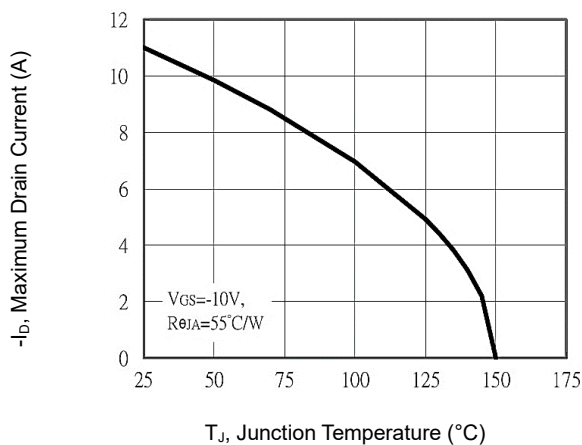
**Breakdown Voltage vs. Junction Temperature**



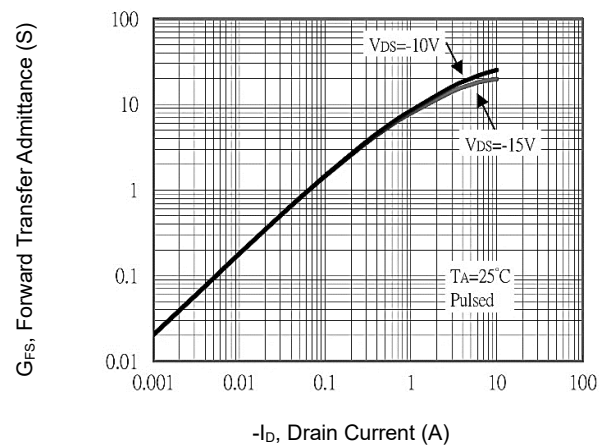
**Capacitance vs. Drain-Source Voltage**



**Maximum Drain Current vs. Junction Temperature**

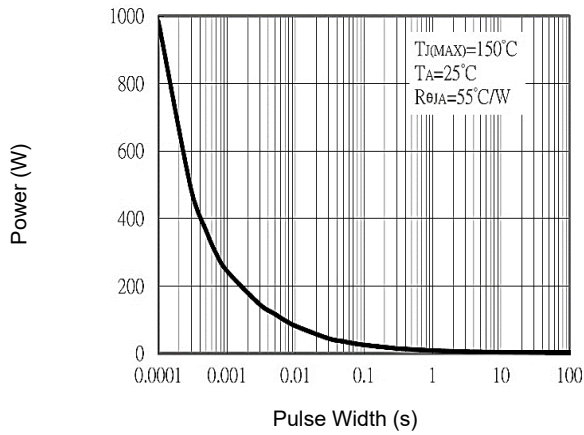


**Forward Transfer Admittance vs. Drain Current**

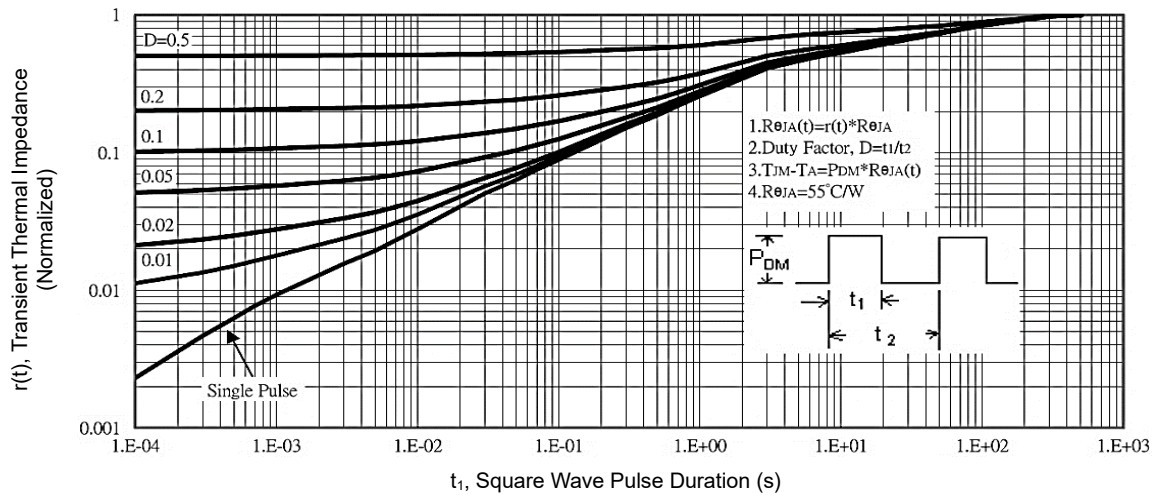


**CHARACTERISTIC CURVES**

**Single Pulse Power Rating**



**Normalized Transient Thermal Impedance Curve**



**P-Channel MOSFET**  
**30V 25A 12W SOP-8**

MFT3P25S8

**MERITEK**

**DIMENSIONS AND RECOMMENDED LAND PATTERN**

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	

