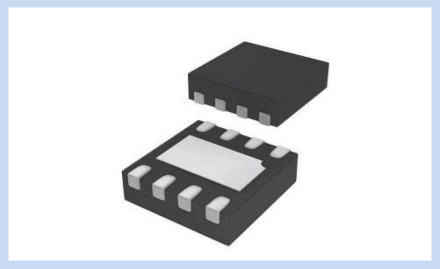
P-Channel MOSFET
30V 30A DFN3x3

MFT3P30D331S **MERITEK**

FEATURE

- Operating temperature: -55 ~ +150 °C
- $R_{DS(ON)}$= 18mΩ @ V_{GS}=-10V
- Fast switching
- Suit for -4.5V Gate Drive Applications



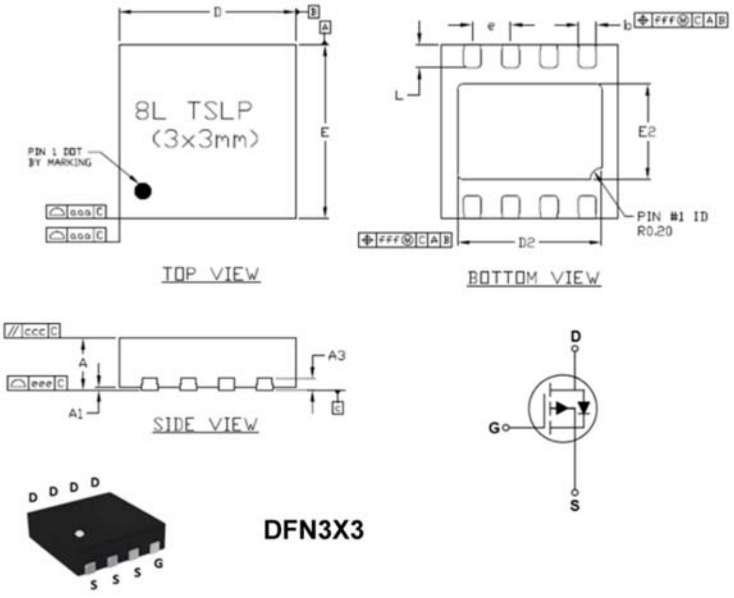
RoHS

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	-30	A
Drain Current – Continuous (T_C=100°C)		-19	A
Drain Current – Pulsed	I_{DM}	-120	A
Power Dissipation (T_C=25°C)	P_D	27	W
Power Dissipation – Derate above 25°C		0.22	W/°C
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance Junction to Case	$R_{\theta JC}$	4.6	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

DIMENSIONS

Item	Min (mm)	Typ (mm)	Max (mm)
A	0.70	0.75	0.80
A1	--	--	0.50
A3	0.203 (REF)		
D	2.95	3.00	3.05
E	2.95	3.00	3.05
D2	2.40	2.45	2.50
E2	1.60	1.65	1.70
b	0.25	0.30	0.35
e	0.65 (BSC)		
L	0.35	0.40	0.45
aaa	0.01		
bbb	0.01		
ccc	0.01		
ddd	0.05		
eee	0.08		
fff	0.10		



Note: Dimensioning and tolerancing per MO-220.

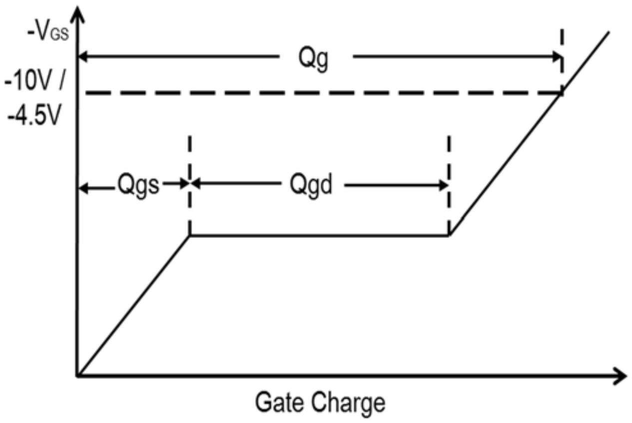
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	BV_{DSS}	-30	--	--	V
BV_{DSS} Temperature Coefficient	Reference to 25°C ,I_D=-1mA	$\triangle BV_{DSS}/\triangle T_J$	--	-0.03	--	V/°C
Drain-Source Leakage Current	V_{DS}=-27V , V_{GS}=0V , T_J=25°C	I_{DSS}	--	--	-1	uA
	V_{DS}=-24V , V_{GS}=0V , T_J=125°C		--	--	-10	uA
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=-8A	$R_{DS(ON)}$	--	14.5	18	mΩ
	V_{GS}=-4.5V , I_D=-6A		--	23	30	mΩ
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=-250uA	$V_{GS(th)}$	-1.2	-1.6	-2.5	V
$V_{GS(th)}$ Temperature Coefficient		$\triangle V_{GS(th)}$	--	4	--	mV/°C
Forward Transconductance	V_{DS}=-10V , I_D=-8A	gfs	--	6.8	--	S
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}=-15V , V_{GS}=-4.5V , I_D=-5A	Q_g	--	11	17	nC
Gate-Source Charge		Q_{gs}	--	3.4	6	
Gate-Drain Charge		Q_{gd}	--	4.2	8	
Turn-On Delay Time	V_{DD}=-15V , V_{GS}=-10V , R_G=6Ω I_D=-1A	$T_{d(on)}$	--	5.8	11	nS
Rise Time		T_r	--	18.8	36	
Turn-Off Delay Time		$T_{d(off)}$	--	46.9	90	
Fall Time		T_f	--	12.3	23	
Input Capacitance	V_{DS}=-15V , V_{GS}=0V , F=1MHz	C_{iss}	--	1250	2500	pF
Output Capacitance		C_{oss}	--	160	320	
Reverse Transfer Capacitance		C_{rss}	--	90	180	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Continuous Source Current	V_G=V_D=0V , Force Current	I_S	--	--	-30	A
Pulsed Source Current		I_{SM}	--	--	-60	A
Diode Forward Voltage	V_{GS}=0V , I_S=-1A , T_J=25°C	V_{SD}	--	--	-1	V

Note:
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤2%.
3. Essentially independent of operating temperature.
4. T_J=25°C, unless otherwise noted.

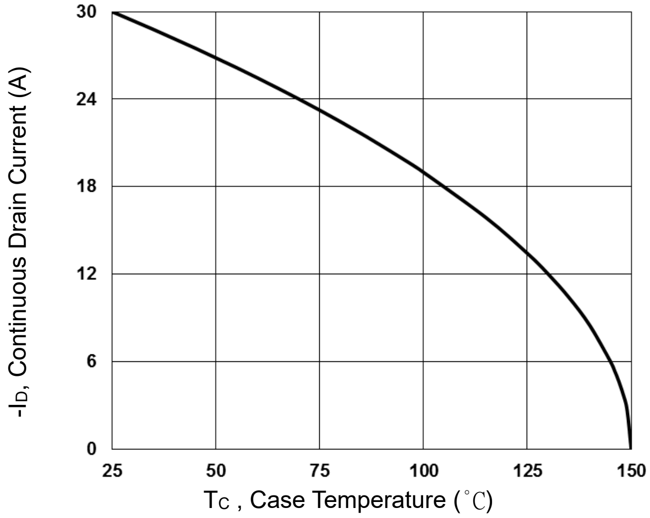
Switching Time Waveform

Gate Charge Waveform

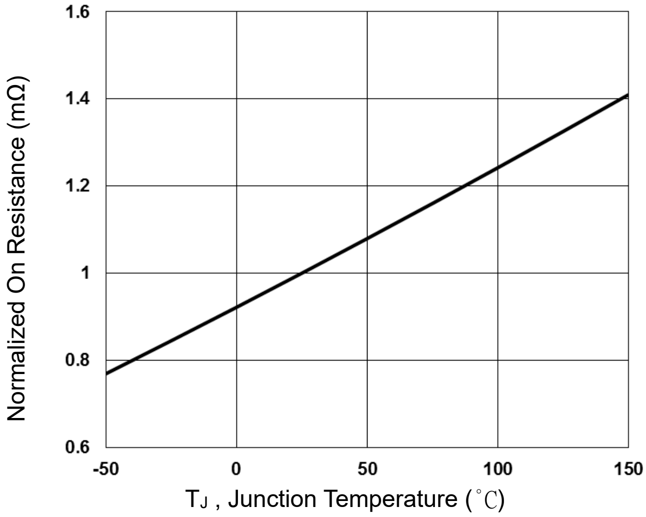


CHARACTERISTIC CURVES

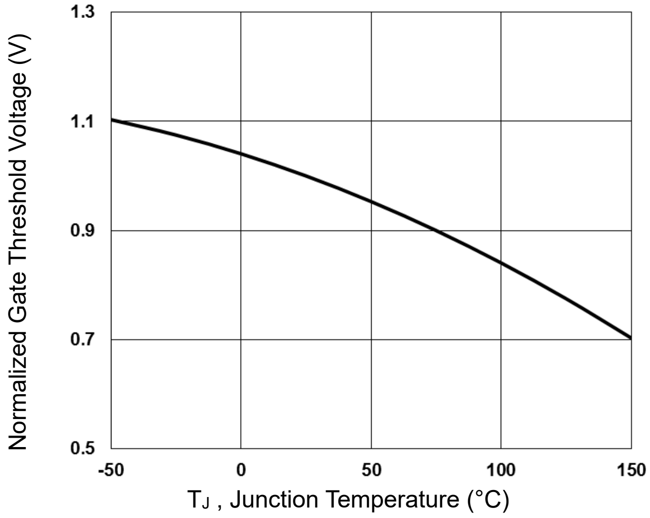
Continuous Drain Current vs. T_C



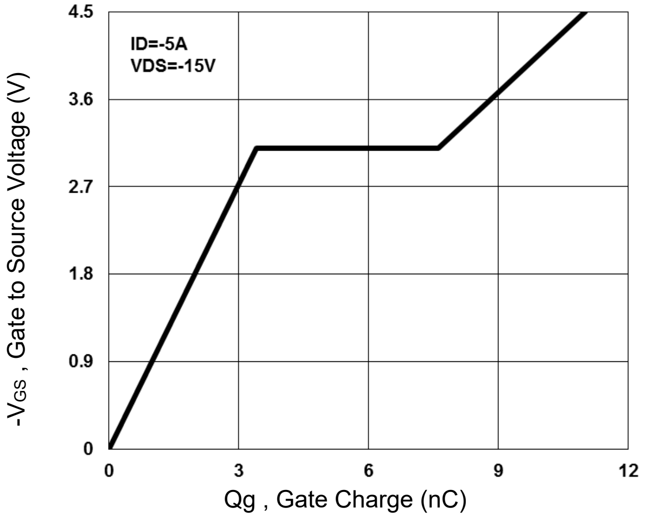
Normalized $R_{DS(ON)}$ vs. T_J



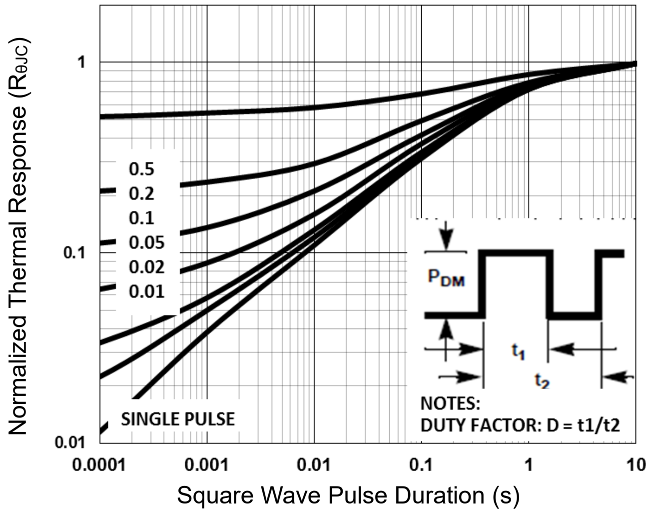
Normalized V_{th} vs. T_J



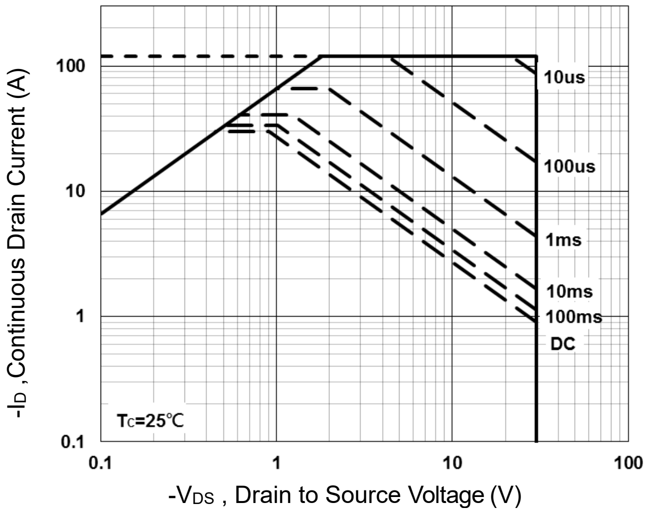
Gate Charge Waveform



Normalized Transient Impedance



Maximum Safe Operation Area



*Specifications subject to change without notice.