

N-Channel MOSFET 100V 10A PPAK3x3

MFT10N10P33S

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FEATURE

- Operating Temperature: -55 ~ +150 °C
- Improved dv/dt Capability
- Fast Switching
- Low Profile Construction Design
- High power and current handing capability

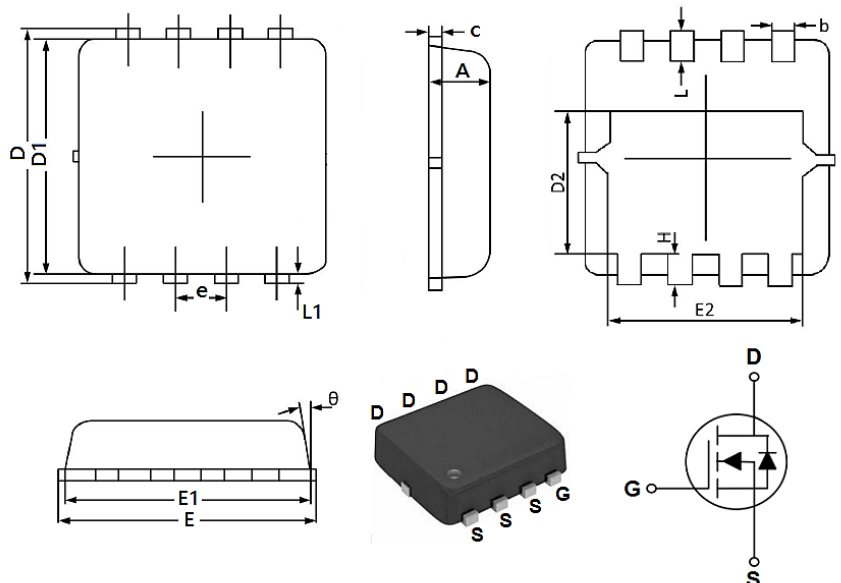


MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current – Continuous	$T_C=25^\circ\text{C}$	I_D	10	A
	$T_C=100^\circ\text{C}$		6.3	A
Drain Current – Pulsed		I_{DM}	40	A
Single Pulse Avalanche Energy		EAS	6	mJ
Single Pulse Avalanche Current		IAS	11	A
Power Dissipation	$T_C=25^\circ\text{C}$	P_D	29.8	W
	Derate above 25°C		0.24	W/°C
Thermal Resistance Junction to Ambient		$R_{\theta JA}$	62	°C/W
Thermal Resistance Junction to Case		$R_{\theta JC}$	4.2	°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)	Max. (mm)
A	0.70	0.90
b	0.24	0.35
c	0.10	0.25
D	3.05	3.45
D1	2.90	3.20
D2	1.35	1.85
E	3.00	3.40
E1	2.90	3.25
E2	2.35	2.60
e	0.650 BSC.	
H	0.30	0.50
L	0.30	0.50
L1	0.07	0.20
θ	0°	12°



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ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	100	--	--	V
BV_{DSS} Temperature Coefficient	Reference to 25°C, $I_D=1mA$	$\Delta BV_{DSS}/\Delta T_J$	--	0.09	--	V/°C
Drain-Source Leakage Current	$V_{DS}=100V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	--	--	1	μA
	$V_{DS}=80V, V_{GS}=0V, T_J=125^\circ C$		--	--	10	μA
Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	--	--	± 100	nA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=10A$	$R_{DS(ON)}$	--	90	115	m Ω
	$V_{GS}=4.5V, I_D=8A$		--	95	120	m Ω
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	1.2	1.6	2.5	V
$V_{GS(th)}$ Temperature Coefficient		$\Delta V_{GS(th)}$	--	-5	--	mV/°C
Forward Transconductance	$V_{DS}=10V, I_D=10A$	g_{fs}	--	8.7	--	S
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=50V, V_{GS}=10V, I_D=2A$	Q_g	--	20	40	nC
Gate-Source Charge		Q_{gs}	--	3.2	6	
Gate-Drain Charge		Q_{gd}	--	3.6	7	
Turn-On Delay Time	$V_{DD}=50V, V_{GS}=10V, R_G=3.3\Omega, I_D=1A$	$T_{d(on)}$	--	18	36	ns
Rise Time		T_r	--	4	8	
Turn-Off Delay Time		$T_{d(off)}$	--	40	80	
Fall Time		T_f	--	3	6	
Input Capacitance	$V_{DS}=25V, V_{GS}=0V, F=1MHz$	C_{iss}	--	1400	2800	pF
Output Capacitance		C_{oss}	--	60	120	
Reverse Transfer Capacitance		C_{rss}	--	35	70	
Gate resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$	R_g	--	2	4	Ω
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	I_S	--	--	10	A
Pulsed Source Current		I_{SM}	--	--	20	A
Diode Forward Voltage	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	V_{SD}	--	--	1	V
Reverse Recovery Time	$I_S=1A, di/dt=100A/\mu s, T_J=25^\circ C$	t_{rr}	--	38	--	ns
Reverse Recovery Charge		Q_{rr}	--	27	--	nC

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=11A, R_G=25\Omega, \text{Starting } T_J=25^\circ C$
3. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

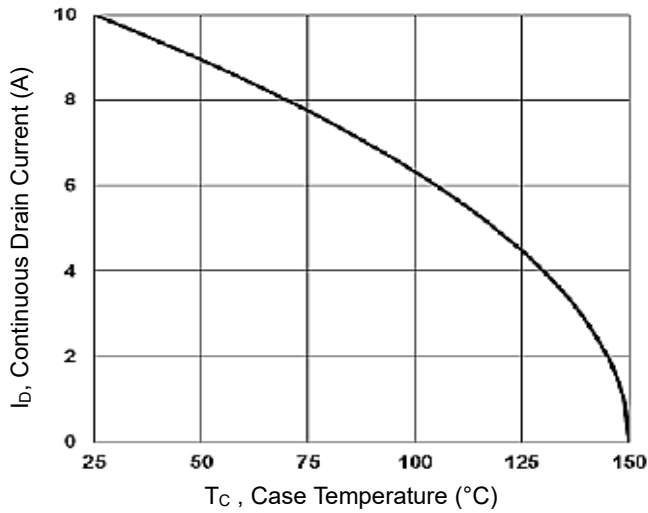
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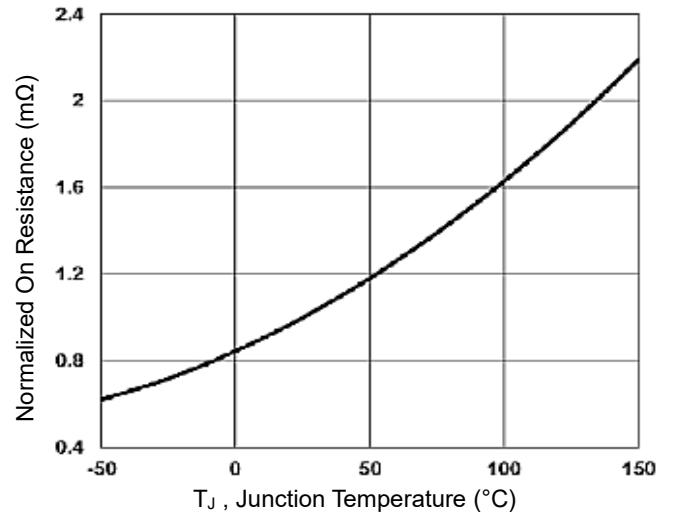
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CHARACTERISTIC CURVES

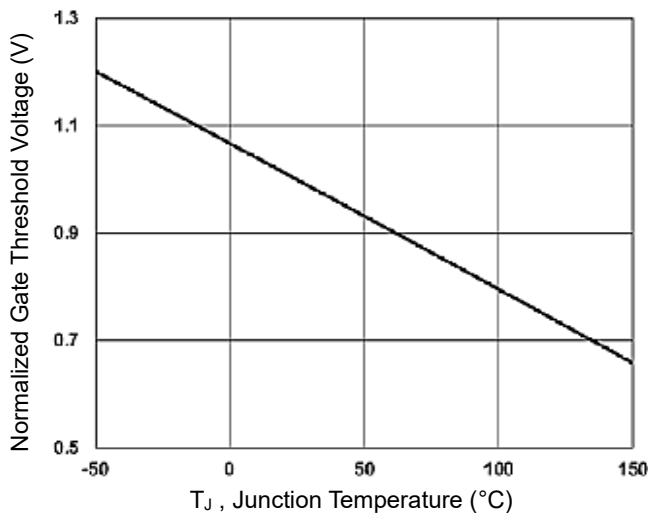
Continuous Drain Current vs. T_c



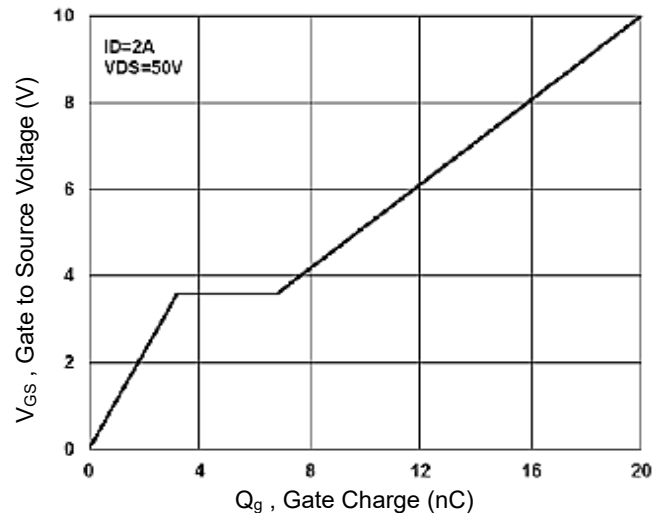
Normalized $R_{DS(on)}$ vs. T_J



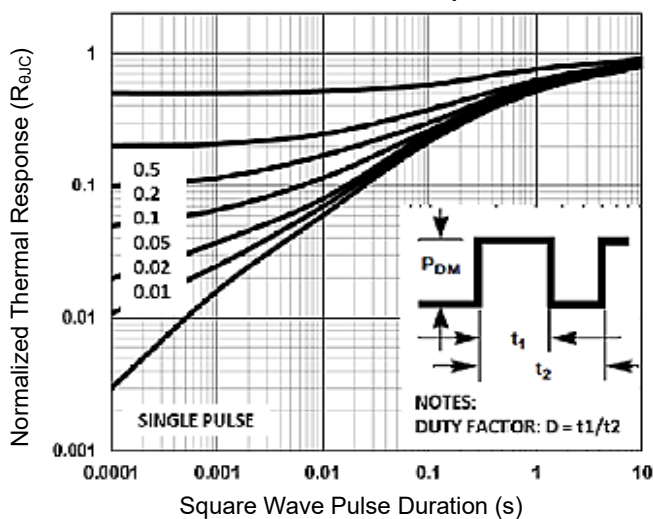
Normalized V_{th} vs. T_J



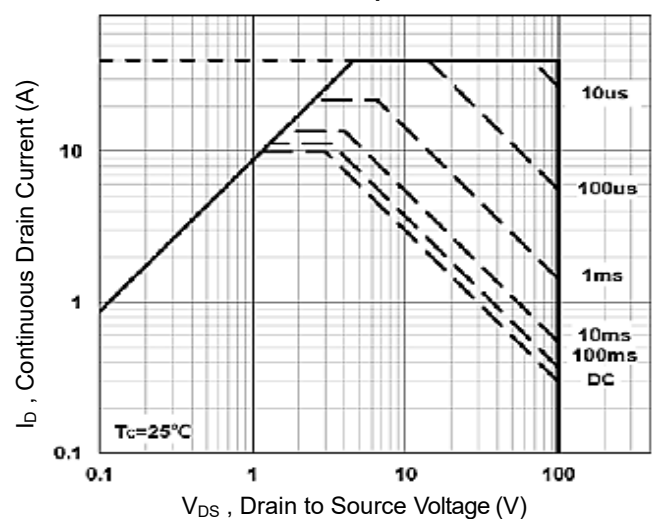
Gate Charge Waveform



Normalized Transient Impedance



Maximum Safe Operation Area



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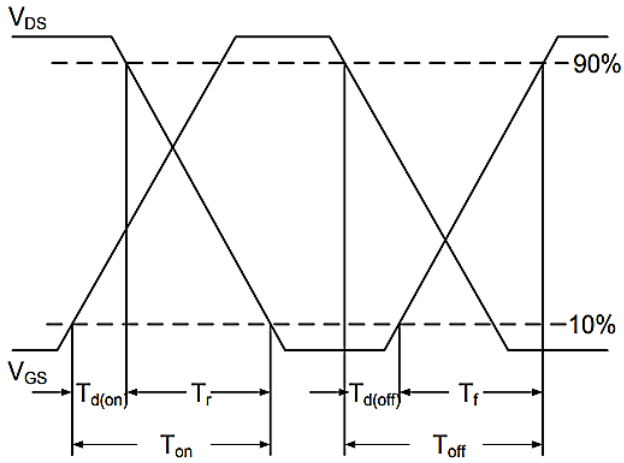
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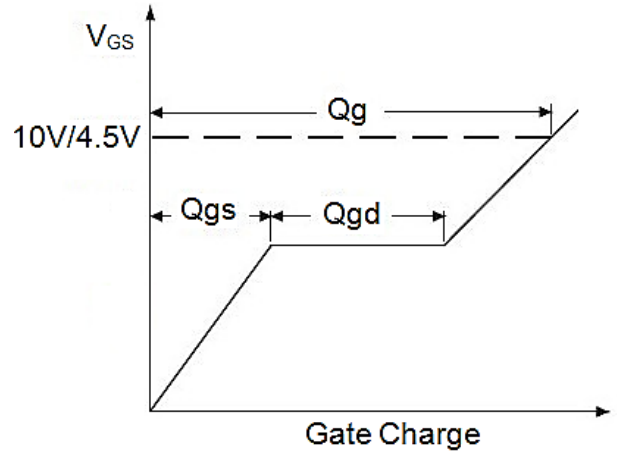
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CHARACTERISTICS CURVES (CONTINUED)

Switching Time Waveform



Gate Charge Waveform



*Specifications subject to change without notice.