

# N-Channel MOSFET

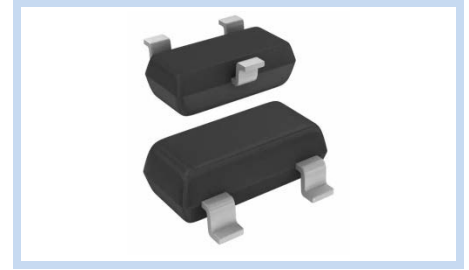
## 60V 3A SOT-23

MFT6N3S23C

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### FEATURE

- Operating temperature: -55 ~ 150 °C
- Low On-Resistance
- Low Gate Drive
- Application: DC-DC Converters, Switch Load, PWM, Motor Control.

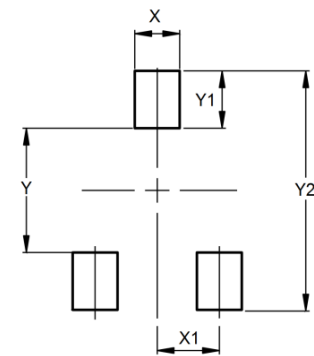
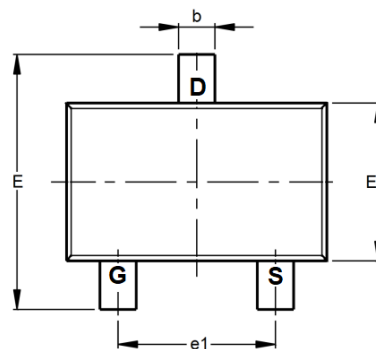
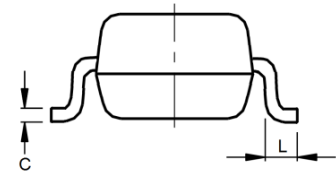
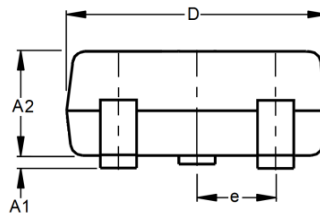


### MAXIMUM RATINGS (TC= 25° C)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current – Continuous	$I_D$	3	A
Drain Current – Pulsed	$I_{DM}$	12	A
Power Dissipation	$P_D$	1.25	W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	100	°C/W
Operating Junction Temperature Range	$T_J, T_{stg}$	-55 to 150	°C

### DIMENSIONS AND RECOMMENDED LAND PATTERN

Item	Min (mm)	Max (mm)
A1	0.90	1.15
A2	0.90	1.05
b	0.30	0.50
C	--	0.13
D	2.80	3.00
e	0.95	0.95
e1	1.80	2.00
E	2.25	2.55
E1	1.20	1.40
L	0.30	0.50
X	0.80	0.80
X1	1.35	1.35
Y	2.00	2.00
Y1	0.90	0.90
Y2	2.90	2.90



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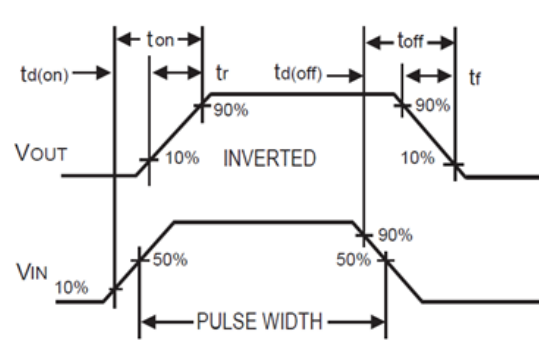
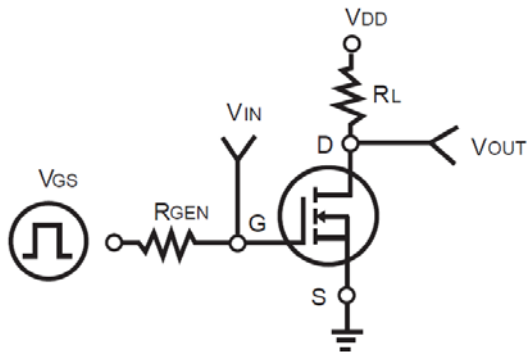
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### ELECTRICAL CHARACTERISTICS

Static Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	$BV_{DSS}$	60	--	--	V
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	1.0	--	3.0	V
Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	$I_{GSS}$	--	--	$\pm 100$	$\mu A$
Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V$	$I_{DSS}$	--	--	1	$\mu A$
Drain-Source On-Resistance	$V_{GS}=10V, I_D=3A$	$R_{DS(ON)}$	--	61	80	m $\Omega$
	$V_{GS}=4.5V, I_D=2.4A$		--	77	100	
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Input Capacitance	$V_{DS}=25V, V_{GS}=0V$ $F=1.0MHz$	$C_{iss}$	--	560	--	pF
Output Capacitance		$C_{oss}$	--	70	--	
Reverse Transfer Capacitance		$C_{rss}$	--	40	--	
Turn-On Delay Time	$V_{DS}=30V, I_D=1A$ $R_G=6\Omega, V_{GEN}=10V$	$T_{d(on)}$	--	11	22	nS
Rise Time		$T_r$	--	3	6	
Turn-Off Delay Time		$T_{d(off)}$	--	28	56	
Fall Time		$T_f$	--	3	6	
Total Gate Charge	$V_{DS}=30V, V_{GS}=10V,$ $I_D=3A$	$Q_g$	--	13	16.9	nC
Gate-Source Charge		$Q_{gs}$	--	1	--	
Gate-Drain Charge		$Q_{gd}$	--	4	--	
Diode Forward Voltage	$I_S=1A, V_{GS}=0V$	$V_{SD}$	--	--	1.2	V
Diode Forward Current		$I_S$	--	--	1	A

Note:

1. Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$
2. Guarantee by design, not test in mass production
3. Repetitive Rating: Pulse width limited by maximum junction temperature.
4. Surface Mounted on FR4 Board,  $t_s \leq 10sec$



### CHARACTERISTIC CURVES

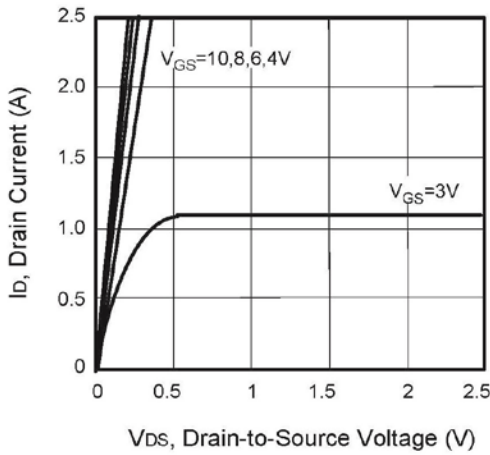


Figure 1. Output Characteristics

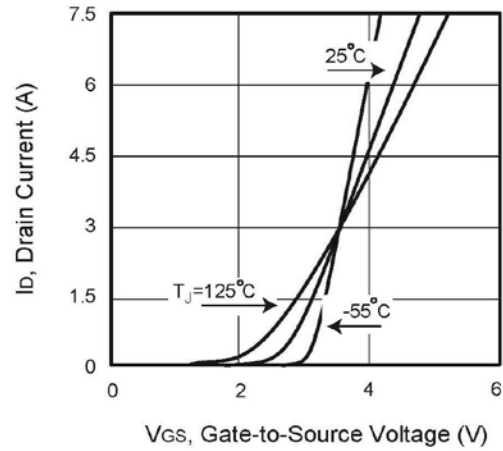


Figure 2. Transfer Characteristics

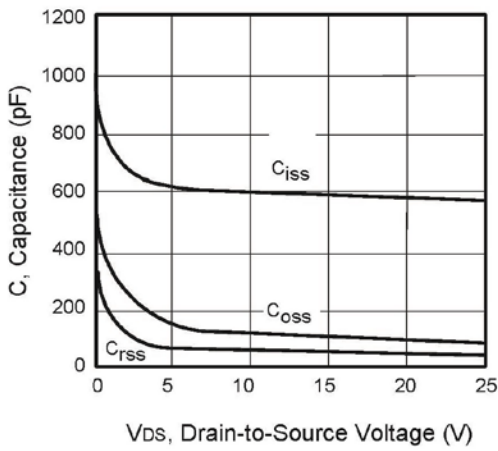


Figure 3. Capacitance

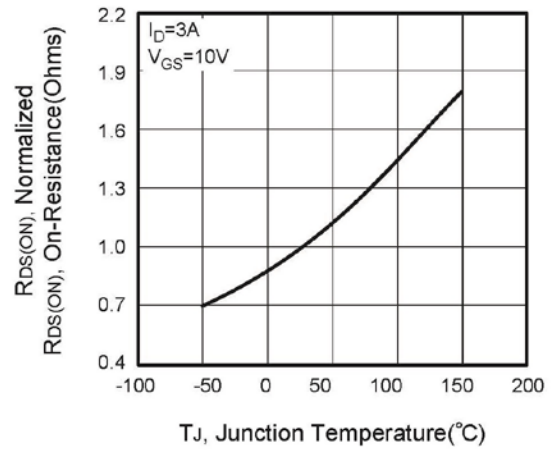


Figure 4. On-Resistance Variation with Temperature

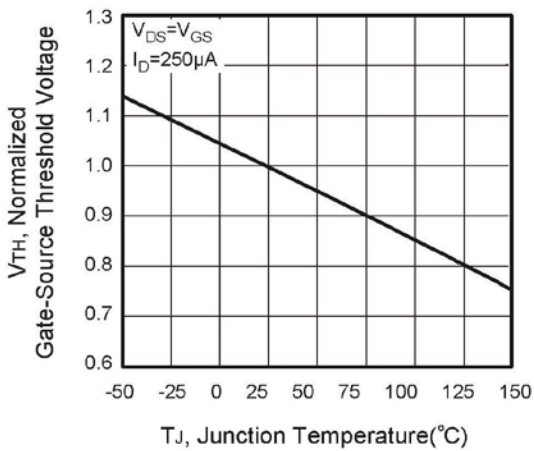


Figure 5. Gate Threshold Variation with Temperature

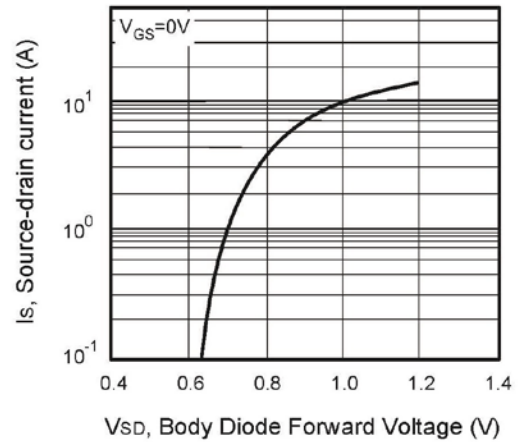
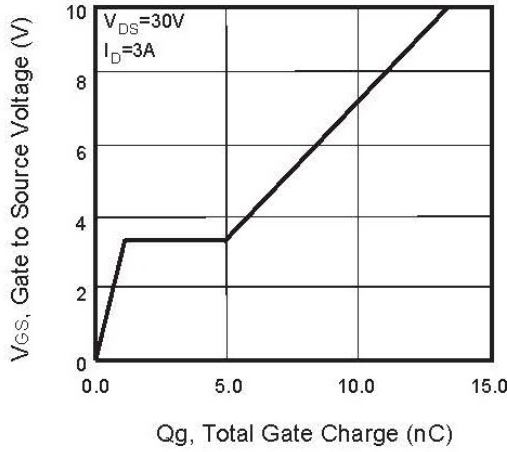
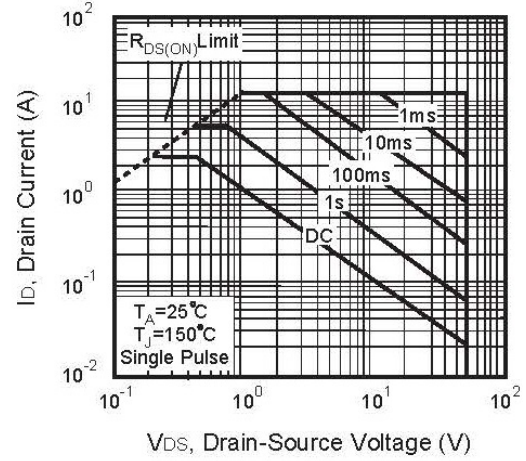


Figure 6. Body Diode Forward Voltage Variation with Source Current

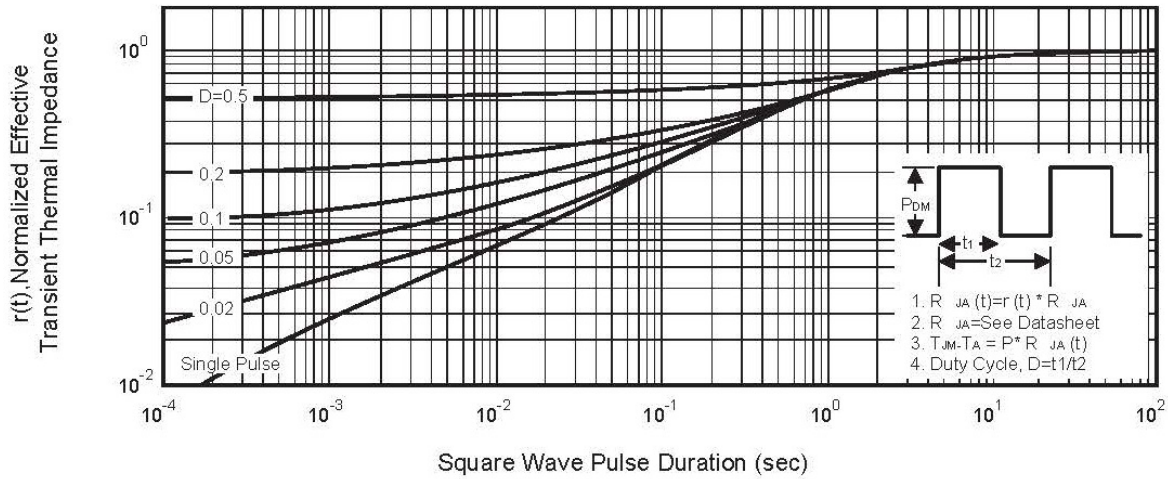
**CHARACTERISTIC CURVES**



**Figure 7. Gate Charge**



**Figure 8. Maximum Safe Operating Area**



**Figure 11. Normalized Thermal Transient Impedance Curve**

\*Specifications subject to change without notice.