

**TF3420** N-Channel 20-V(D-S) MOSFET

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
20V	0.024Ω@10V	6.0A
	0.027Ω@4.5V	
	0.035Ω@2.5V	

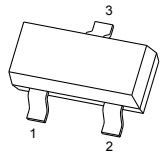
**General FEATURE**

- TrenchFET Power MOSFET
- Lead free product is acquired
- Surface mount package

**APPLICATION**

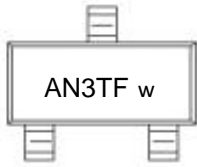
- Load Switch for Portable Devices
- DC/DC Converter

**SOT-23**



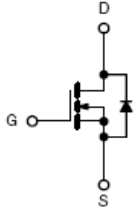
1.GATE  
2.SOURCE  
3.DRAIN

**MARKING**



\*w: week code

**Equivalent Circuit**



**Maximum ratings ( $T_a=25^{\circ}C$  unless otherwise noted)**

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	±12	
Continuous Drain Current	$I_D$	6.0	A
Pulsed Drain Current*1	$I_{DM}$	20	
Continuous Source-Drain Diode Current	$I_S$	1.25	
Maximum Power Dissipation	$P_D$	1.25	W
Thermal Resistance from Junction to Ambient( $t \leq 10s$ )	$R_{\theta JA}$	100	$^{\circ}C/W$
Junction Temperature	$T_J$	150	$^{\circ}C$
Storage Temperature	$T_{stg}$	-55 ~+150	

Note :

\*1. Pulse Width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$



**SOT-23 Plastic-Encapsulate MOSFETS**

**TF3420**

**MOSFET ELECTRICAL CHARACTERISTICS**

**T<sub>a</sub> =25 °C unless otherwise specified**

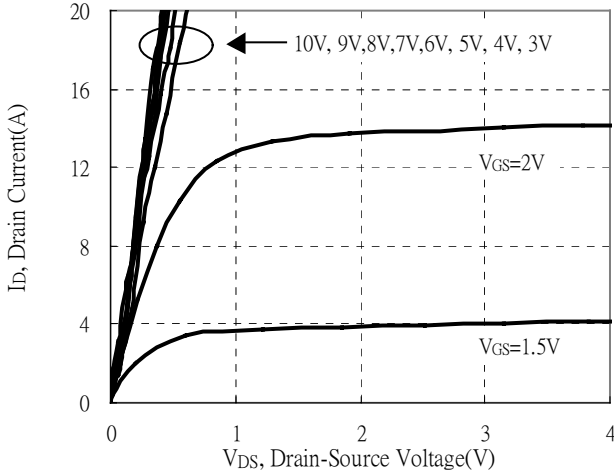
Parameter	Symbol	Test Condition	Min	Typ	Max	Units
<b>Static</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	20			V
Gate-source threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> = 250μA	0.5	0.8	1.0	
Gate-source leakage	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V			±100	nA
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =16V, V <sub>GS</sub> =0V			100	nA
Drain-source on-state resistance <sup>a</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =6A		0.016	0.024	Ω
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A		0.019	0.027	
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =4A		0.023	0.035	
Forward transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =6A		25	-	S
<b>Dynamic<sup>b</sup></b>						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f =1MHz		742		pF
Output capacitance	C <sub>oss</sub>			66		
Reverse transfer capacitance	C <sub>rss</sub>			78		
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A		9.0		nC
Gate-source charge	Q <sub>gs</sub>			1.5		
Gate-drain charge	Q <sub>gd</sub>			2.6		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =10V, I <sub>D</sub> =1A V <sub>GEN</sub> =4.5V, R <sub>g</sub> =6Ω		12.0		ns
Rise time	t <sub>r</sub>			23.0		
Turn-off delay time	t <sub>d(off)</sub>			14.0		
Fall time	t <sub>f</sub>			9.0		
<b>Drain-source body diode characteristics</b>						
Continuous source-drain diode current	I <sub>S</sub>	T <sub>C</sub> =25°C			1.25	A
Body diode voltage	V <sub>SD</sub>	I <sub>S</sub> =1.0A		0.7	1.0	V

**Notes :**

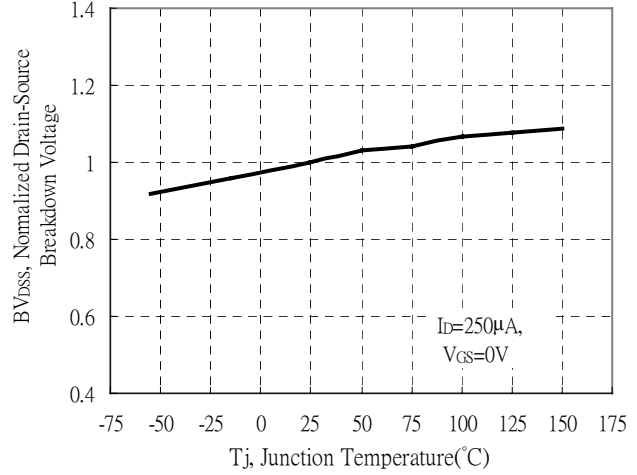
- a.Pulse Test : Pulse Width < 300μs, Duty Cycle ≤2%.
- b.Guaranteed by design, not subject to production testing.

Typical Characteristics

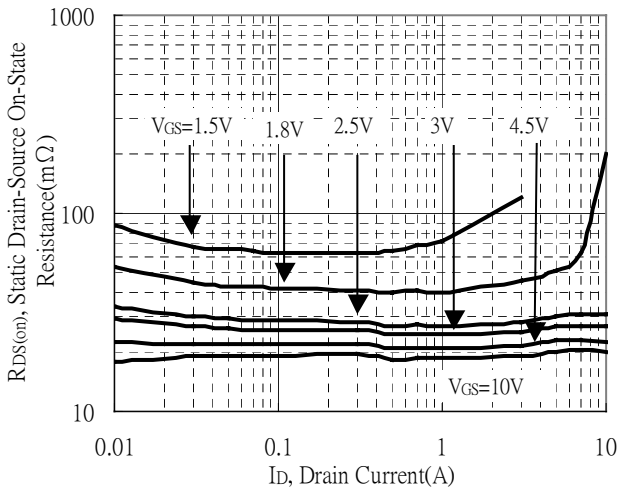
Typical Output Characteristics



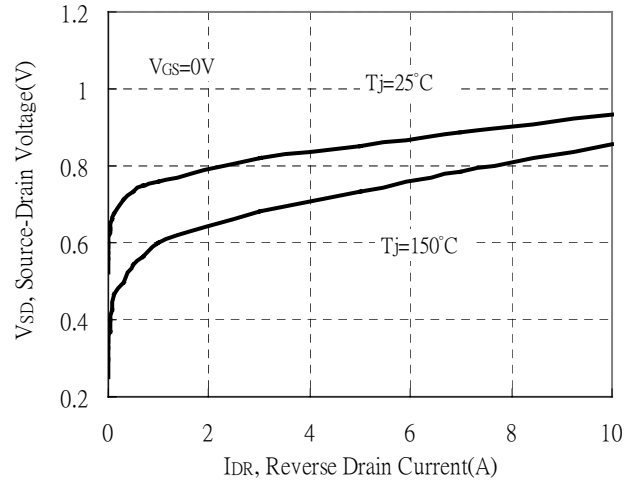
Brekdown Voltage vs Ambient Temperature



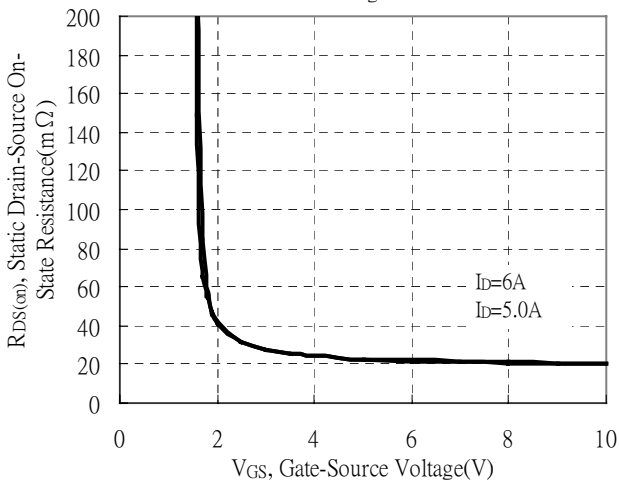
Static Drain-Source On-State resistance vs Drain Current



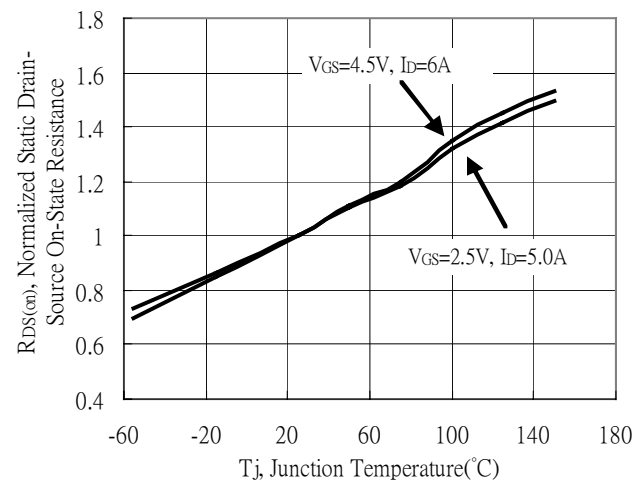
Reverse Drain Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

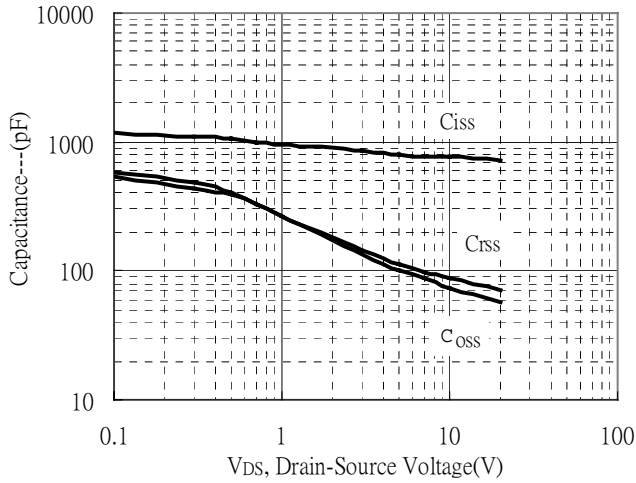


Drain-Source On-State Resistance vs Junction Temperature

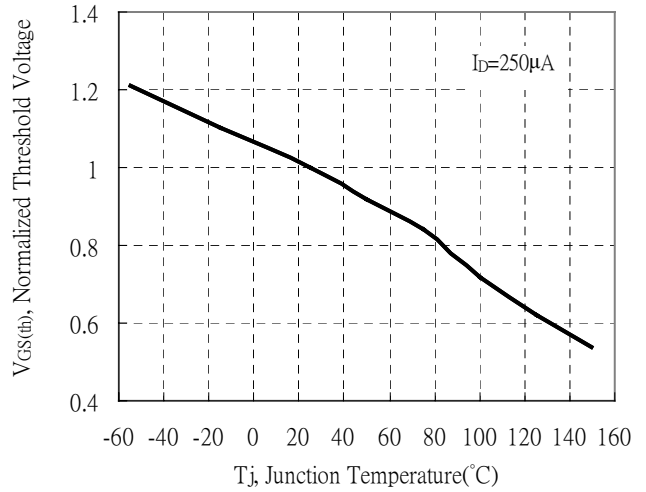


Typical Characteristics(Cont.)

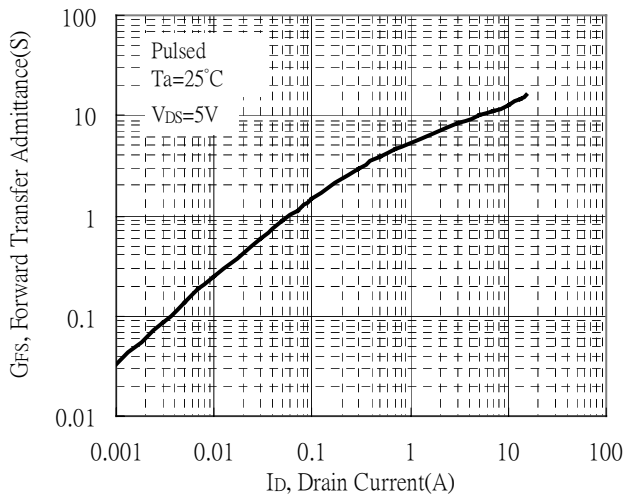
Capacitance vs Drain-to-Source Voltage



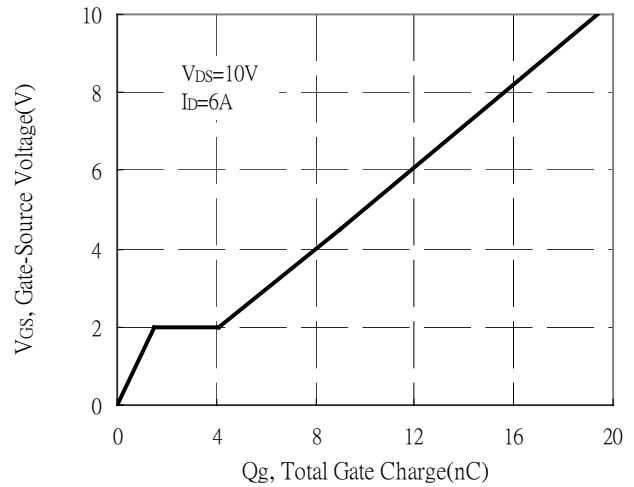
Threshold Voltage vs Junction Temperature



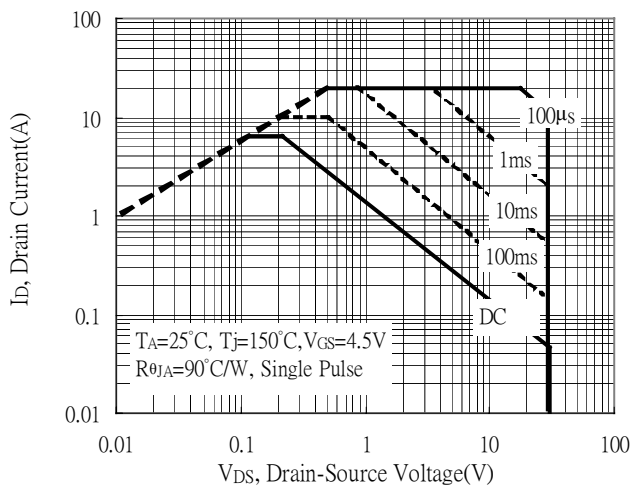
Forward Transfer Admittance vs Drain Current



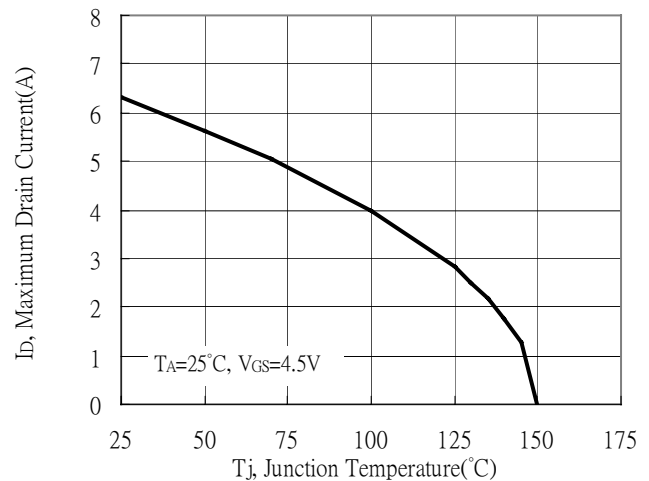
Gate Charge Characteristics



Maximum Safe Operating Area

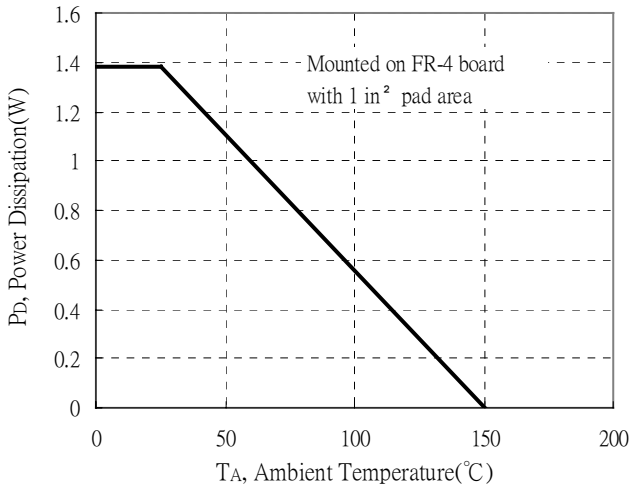


Maximum Drain Current vs Junction Temperature

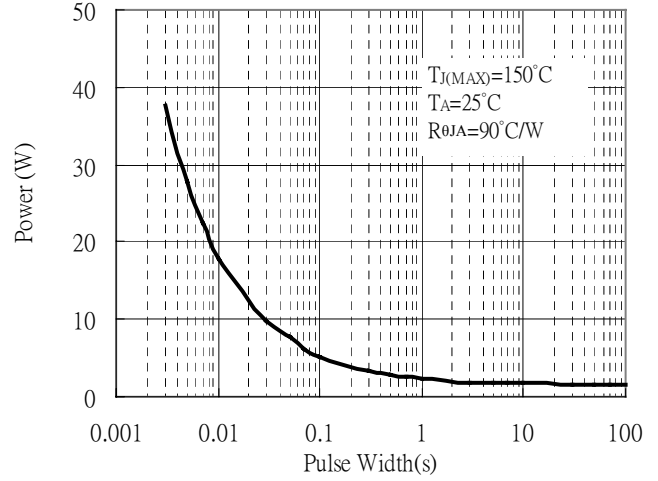


Typical Characteristics(Cont.)

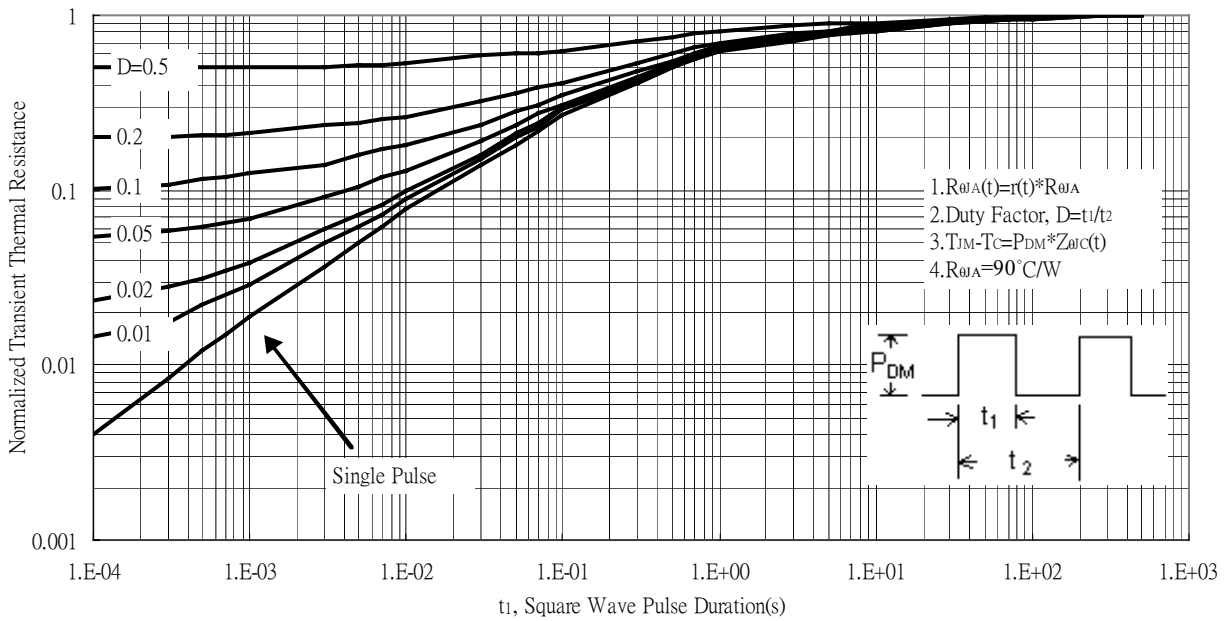
Power Derating Curve



Single Pulse Power Rating, Junction to Ambient (Note on page 1)



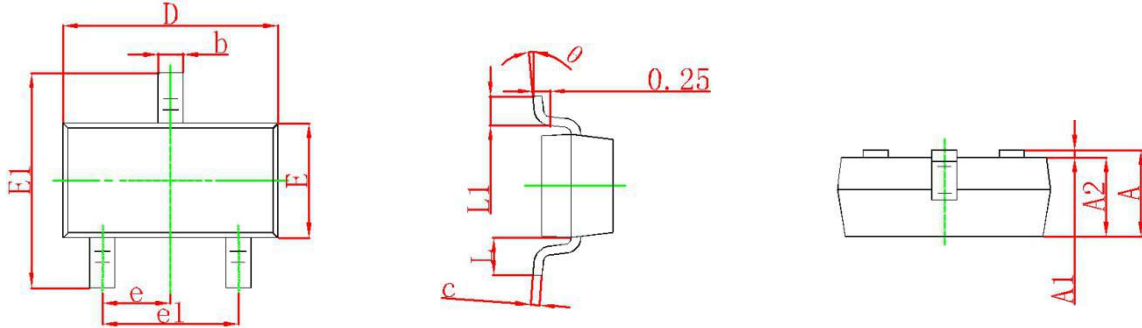
Transient Thermal Response Curves



# SOT-23 Plastic-Encapsulate MOSFETS

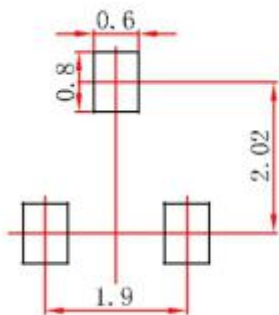
TF3420

## SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

## SOT-23 Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.