

TF2317 P-Channel 20-V(D-S) MOSFET

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-20V	0.022Ω@-4.5V	-7.0A
	0.027Ω@-2.5V	
	0.045Ω@-1.8V	

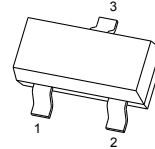
General FEATURE

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

APPLICATION

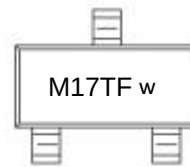
- Load Switch for Portable Devices
- DC/DC Converter

SOT-23-3L



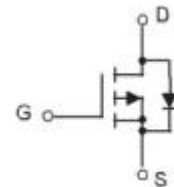
- 1.GATE
- 2.SOURCE
- 3.DRAIN

MARKING



*w: week code

Equivalent Circuit



Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter		Rating	Unit
V _{DSS}	Drain-Source Voltage		-20	V
V _{GSS}	Gate-Source Voltage		±12	
I _D *	Continuous Drain Current	V _{GS} =-4.5V	-7.0	A
I _{DM} *	300μs Pulsed Drain Current		-18	
I _S *	Diode Continuous Forward Current		-1	A
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	
P _D *	Maximum Power Dissipation	Ta=25°C	2.0	W
R _{θJA} *	Thermal Resistance-Junction to Ambient		150	°C/W

Note : *Surface Mounted on 1in² pad area, $t \leq 10\text{sec}$.

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	TF2317			Unit
			Min.	Typ.	Max.	
STATIC CHARACTERISTICS						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =-250μA	-20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-16V, V _{GS} =0V	-	-	-1	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-0.5	-0.7	-1	V
I _{GSS}	Gate Leakage Current	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^a	Drain-Source On-State Resistance	V _{GS} =-4.5V, I _{DS} =-6.0A	-	22	25	mΩ
		V _{GS} =-2.5V, I _{DS} =-5.0A	-	27	33	
		V _{GS} =-1.8V, I _{DS} =-3.0A	-	45	50	
V _{SD} ^a	Diode Forward Voltage	I _{SD} =-1A, V _{GS} =0V	-	-0.7	-1.3	V
GATE CHARGE CHARACTERISTICS ^b						
Q _g	Total Gate Charge	V _{DS} =-10V, V _{GS} =-4.5V, I _{DS} =-4.5A	-	14	20	nC
Q _{gs}	Gate-Source Charge		-	2.1	-	
Q _{gd}	Gate-Drain Charge		-	4.7	-	
DYNAMIC CHARACTERISTICS ^b						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz	-	7	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-10V, Frequency=1.0MHz	-	1520	-	pF
C _{oss}	Output Capacitance		-	225	-	
C _{rss}	Reverse Transfer Capacitance		-	165	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-10V, R _L =10Ω, I _{DS} =-1A, V _{GEN} =-4.5V, R _G =6Ω	-	6	12	ns
t _r	Turn-on Rise Time		-	13	24	
t _{d(OFF)}	Turn-off Delay Time		-	86	156	
t _f	Turn-off Fall Time		-	42	77	
t _{rr}	Reverse Recovery Time	I _{SD} =-4.5A, dI _{SD} /dt =100A/μs	-	21	-	ns
q _{rr}	Reverse Recovery Charge		-	9	-	nC

Note a : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Note b : Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics

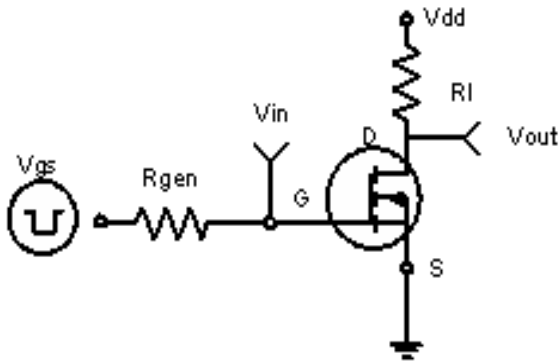


Figure 1: Switching Test Circuit

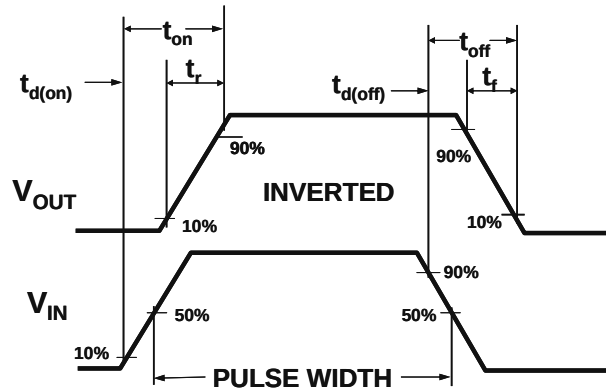
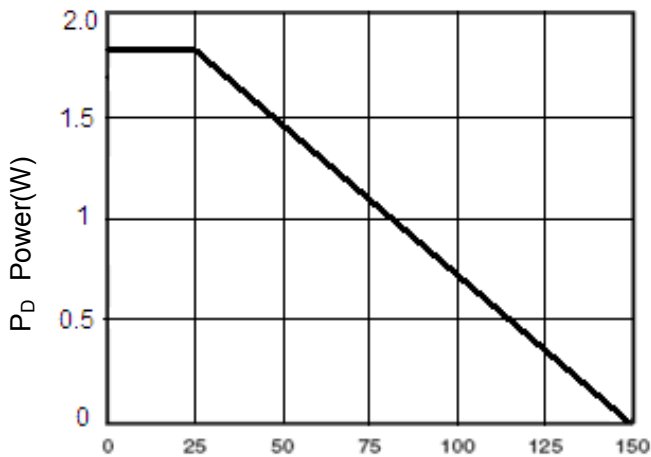
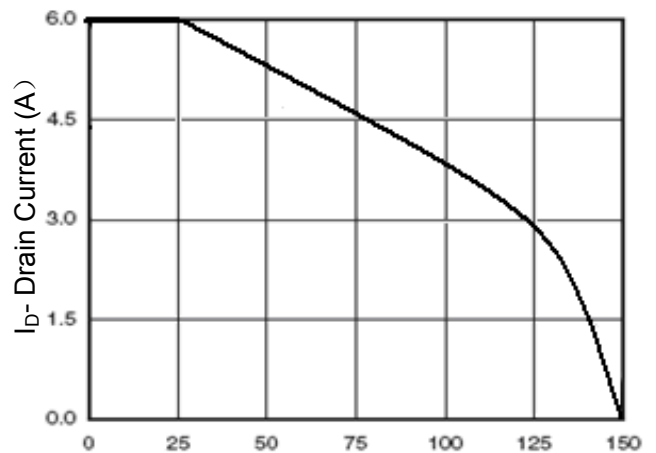


Figure 2: Switching Waveforms



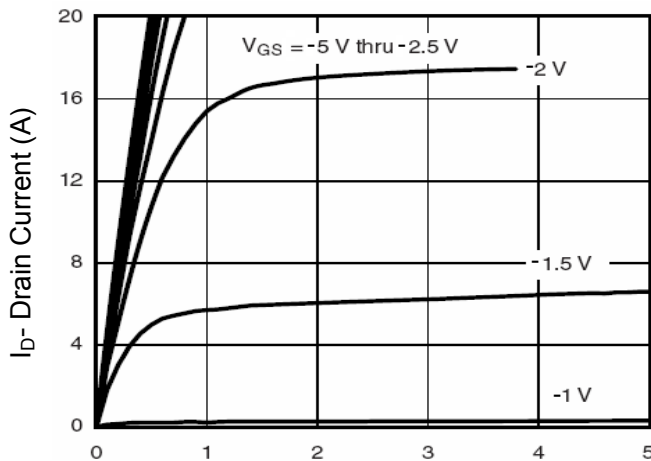
T_J -Junction Temperature(°C)

Figure 3 Power Dissipation



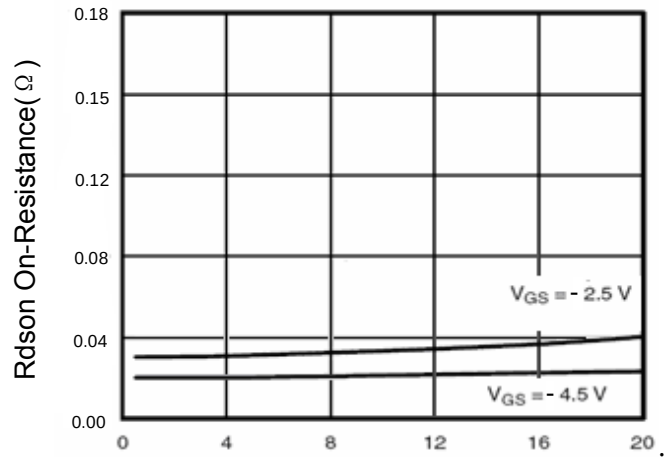
T_J -Junction Temperature(°C)

Figure 4 Drain Current



V_{DS} Drain-Source Voltage (V)

Figure 5 Output Characteristics



I_D - Drain Current (A)

Figure 6 Drain-Source On-Resistance

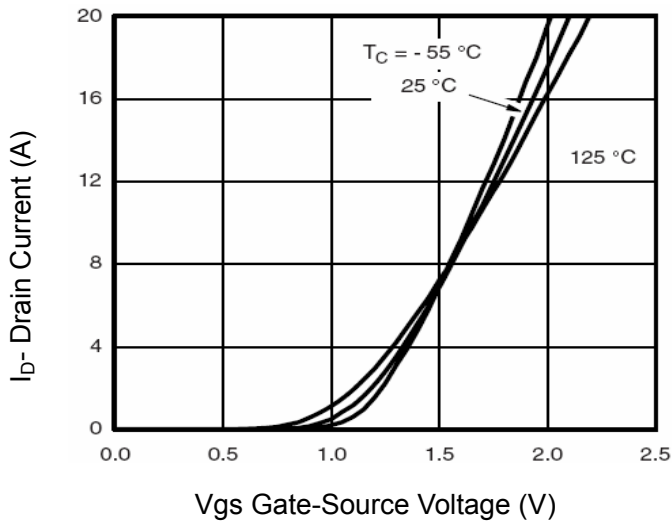


Figure 7 Transfer Characteristics

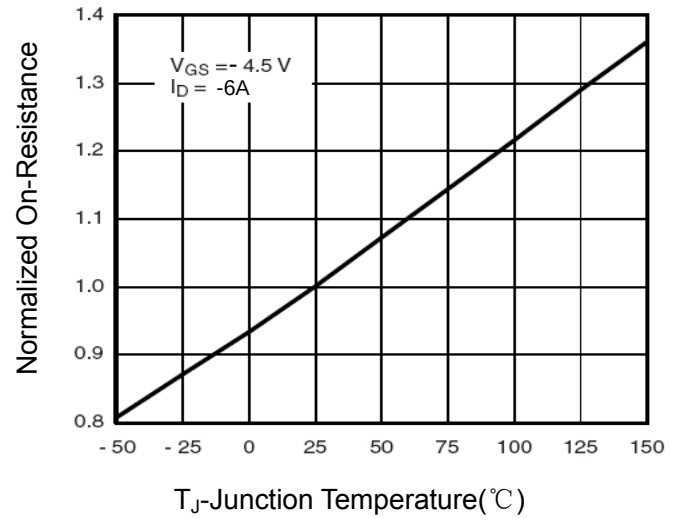


Figure 8 Drain-Source On-Resistance

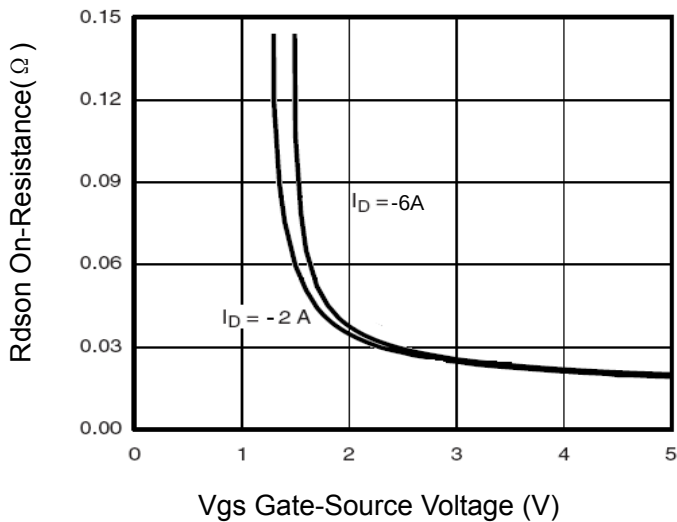


Figure 9 Rdson vs VGS

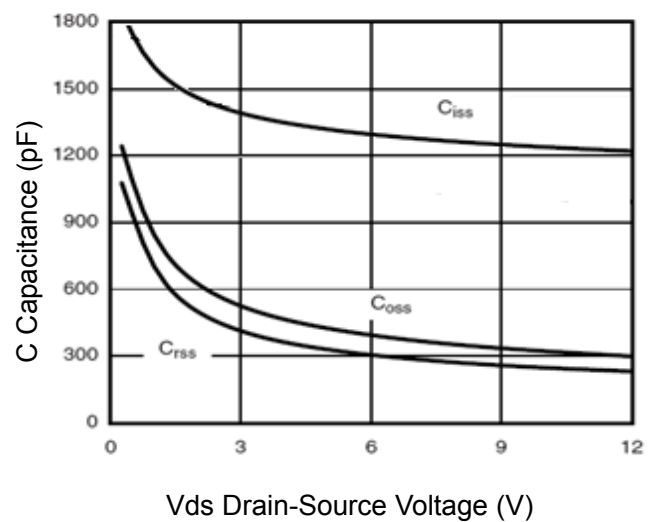


Figure 10 Capacitance vs Vds

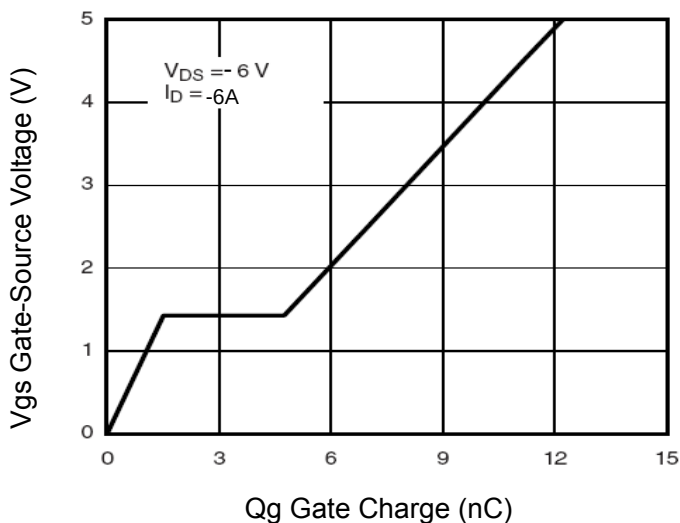


Figure 11 Gate Charge

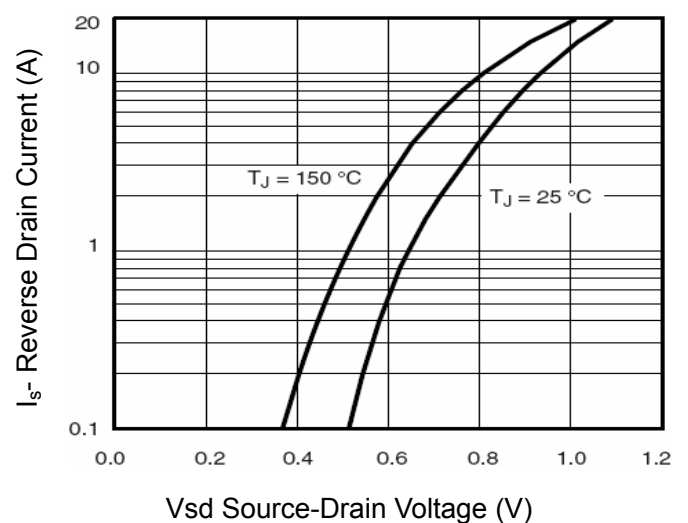


Figure 12 Source- Drain Diode Forward

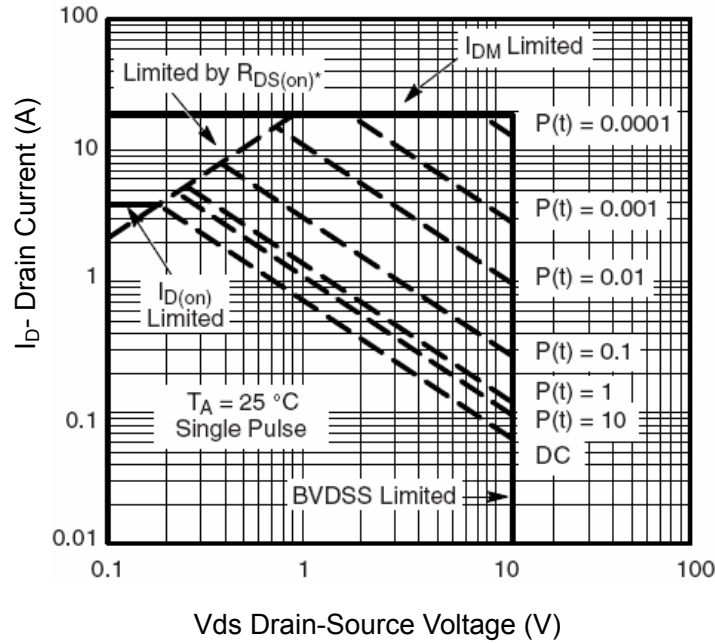


Figure 13 Safe Operation Area

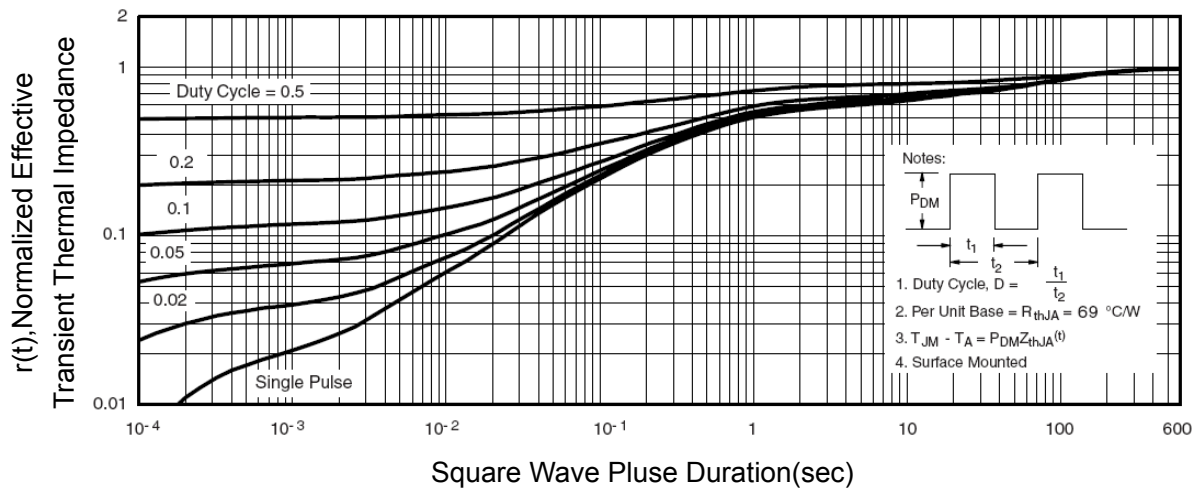
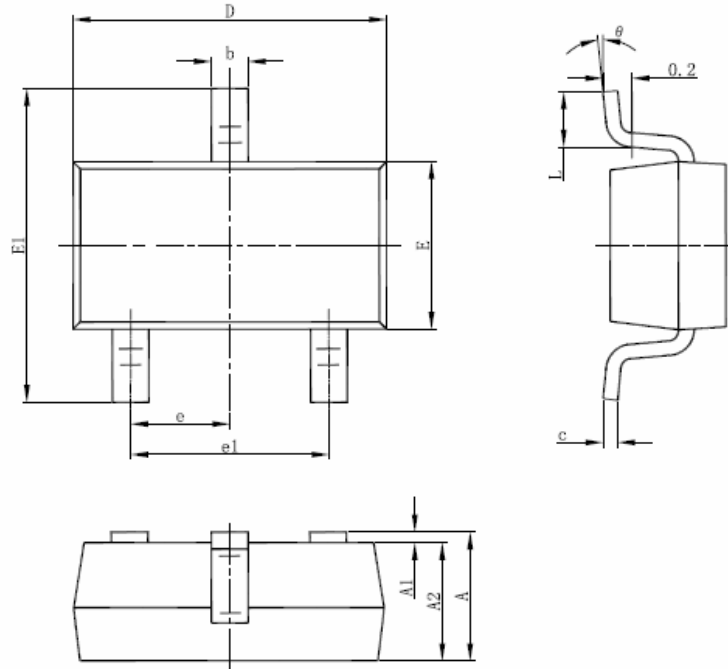


Figure 14 Normalized Maximum Transient Thermal Impedance

SOT-23-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Notes

1. All dimensions are in millimeters.
2. Tolerance $\pm 0.10\text{mm}$ (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.