SamHop Microelectronics Corp.

STF8204

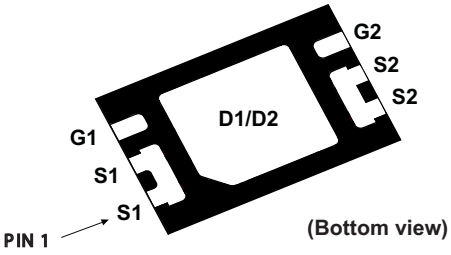
Ver 2.1

Dual N-Channel Enhancement Mode Field Effect Transistor

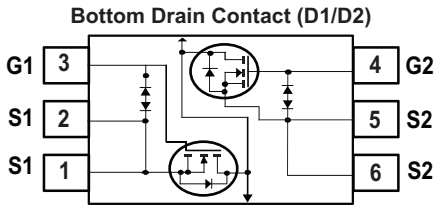
PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Max
20V	9.5A	9.0 @ VGS=4.5V
		9.5 @ VGS=4.0V
		10.0 @ VGS=3.7V
		11.2 @ VGS=3.1V
		13.5 @ VGS=2.5V

FEATURES

- Super high dense cell design for low $R_{DS(ON)}$.
- Rugged and reliable.
- Suface Mount Package.
- ESD Protected.



TDFN 2X3



ABSOLUTE MAXIMUM RATINGS (T_A=25°C unless otherwise noted)

Symbol	Parameter		Limit	Units
V_{DS}	Drain-Source Voltage		20	V
V_{GS}	Gate-Source Voltage		±12	V
I_D	Drain Current-Continuous [c]	T_A=25°C	9.5	A
		T_A=70°C	7.6	A
I_{DM}	-Pulsed [a c]		60	A
P_D	Maximum Power Dissipation	T_A=25°C	1.56	W
		T_A=70°C	1.00	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		-55 to 150	°C

THERMAL CHARACTERISTICS

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	80	°C/W

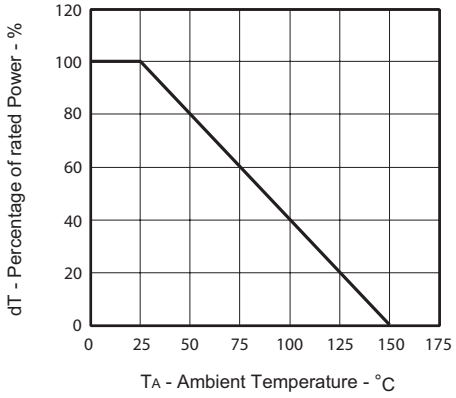
ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	20			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=18V , V_{GS}=0V			1	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}= ±8V , V_{DS}=0V			±1	uA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=1.0mA	0.5	0.85	1.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=4.5V , I_D=2.4A	6.3	7.8	9.0	m ohm
		V_{GS}=4.0V , I_D=2.4A	6.5	8.0	9.5	m ohm
		V_{GS}=3.7V , I_D=2.4A	6.7	8.2	10.0	m ohm
		V_{GS}=3.1V , I_D=2.4A	7.0	9.0	11.2	m ohm
		V_{GS}=2.5V , I_D=2.4A	8.0	10.5	13.5	m ohm
g_{FS}	Forward Transconductance	V_{DS}=5V , I_D=4.75A		28		S
DYNAMIC CHARACTERISTICS [b]						
C_{ISS}	Input Capacitance	V_{DS}=10V,V_{GS}=0V f=1.0MHz		980		pF
C_{OSS}	Output Capacitance			213		pF
C_{RSS}	Reverse Transfer Capacitance			189		pF
SWITCHING CHARACTERISTICS [b]						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=16V I_D=4.75A V_{GS}=4.5V R_{GEN}= 6 ohm		24		ns
t_r	Rise Time			66		ns
$t_{D(OFF)}$	Turn-Off Delay Time			116		ns
t_f	Fall Time			46		ns
Q_g	Total Gate Charge	V_{DS}=16V,I_D=9.5A, V_{GS}=4.5V		10.7		nC
Q_{gs}	Gate-Source Charge			2.1		nC
Q_{gd}	Gate-Drain Charge			5.4		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=9.5A		0.84	1.2	V

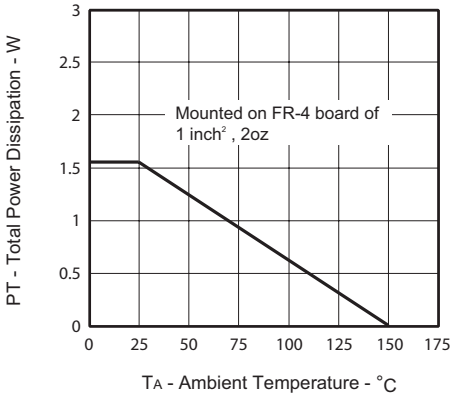
Notes

a.Pulse Test:Pulse Width ≤ 10us, Duty Cycle ≤ 1%.
b.Guaranteed by design, not subject to production testing.
c.Drain current limited by maximum junction temperature.
d.Mounted on FR4 Board of 1 inch^2 , 2oz.

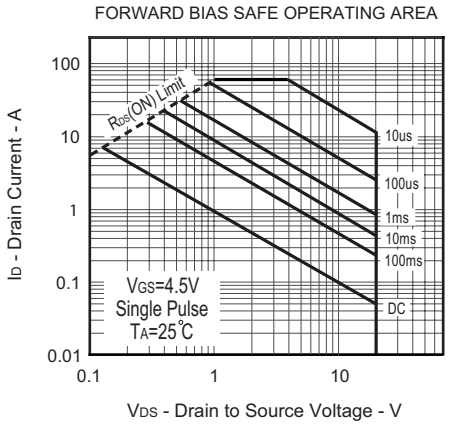
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



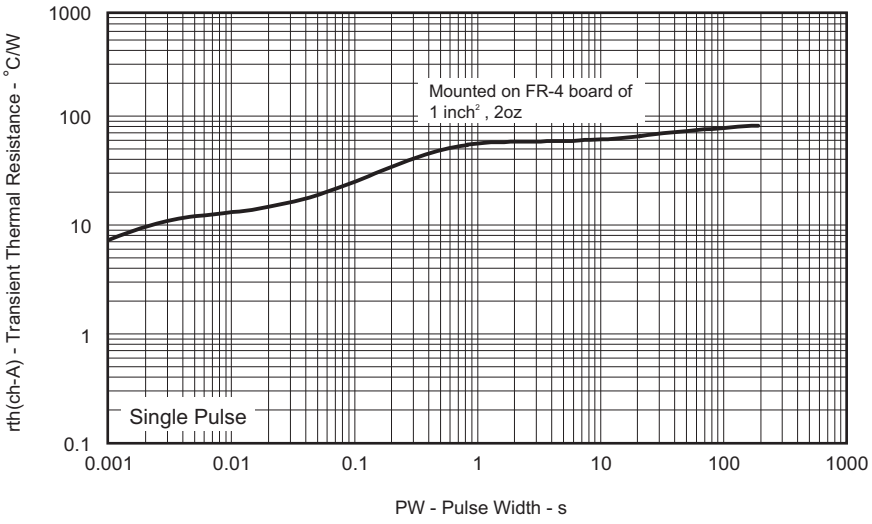
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



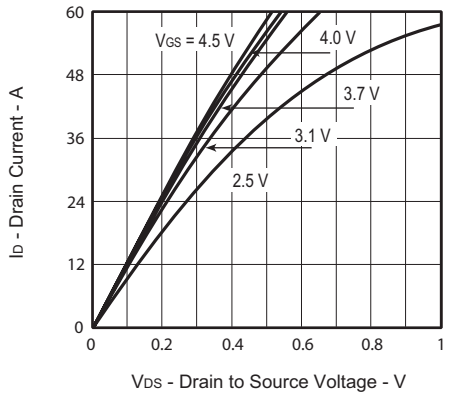
FORWARD BIAS SAFE OPERATING AREA



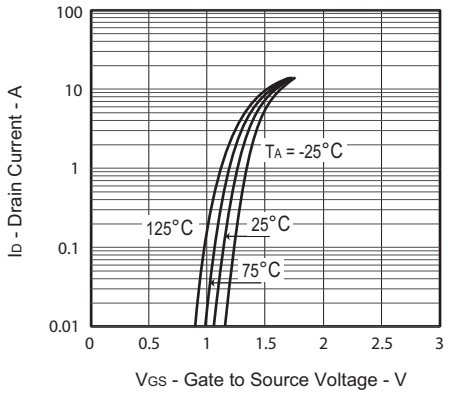
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



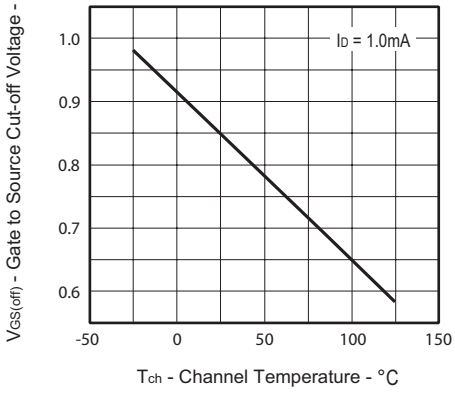
DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



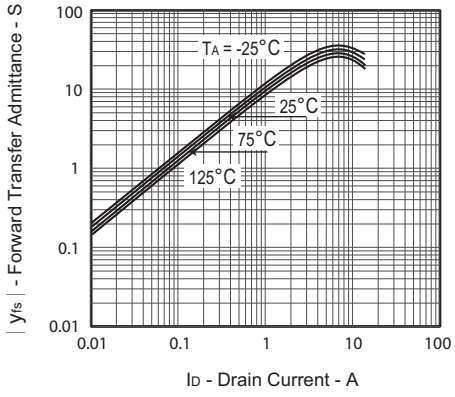
FORWARD TRANSFER CHARACTERISTICS



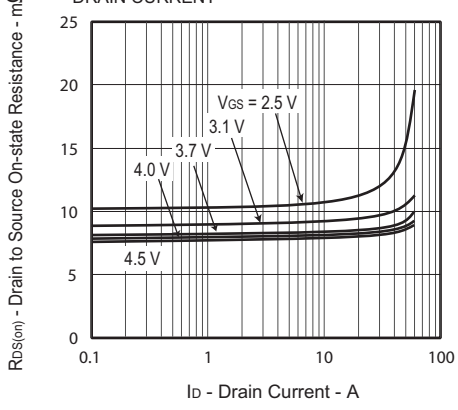
GATEBTO SOURE CUT-OFF VOLTAGE vs.
CHANNEL TEMPERATURE



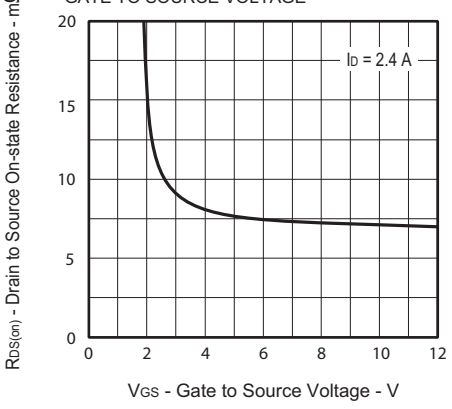
FORWARD TRANSFER ADMITTANCE vs.
DRAIN CURRENT



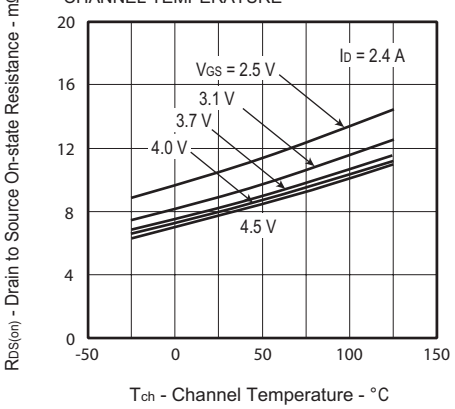
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
DRAIN CURRENT



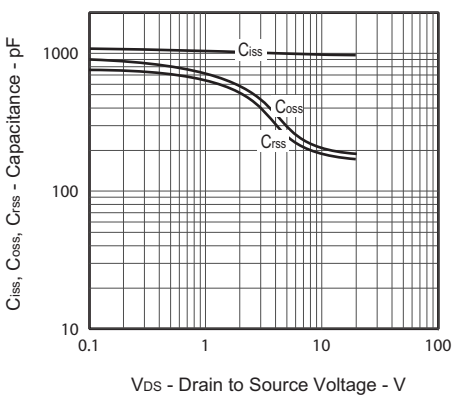
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



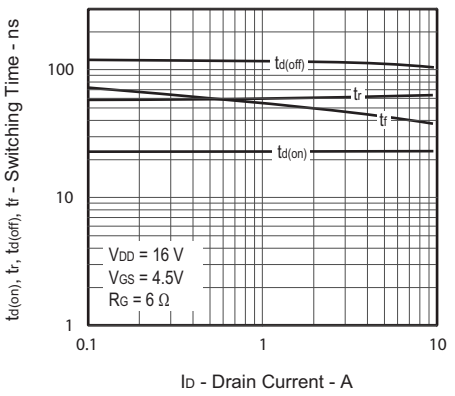
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



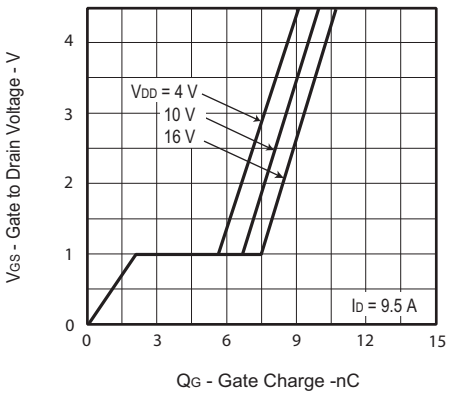
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



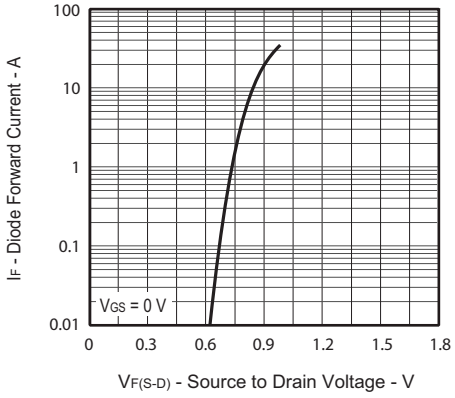
SWITCHING CHARACTERISTICS



DYNAMIC INPUT CHARACTERISTICS

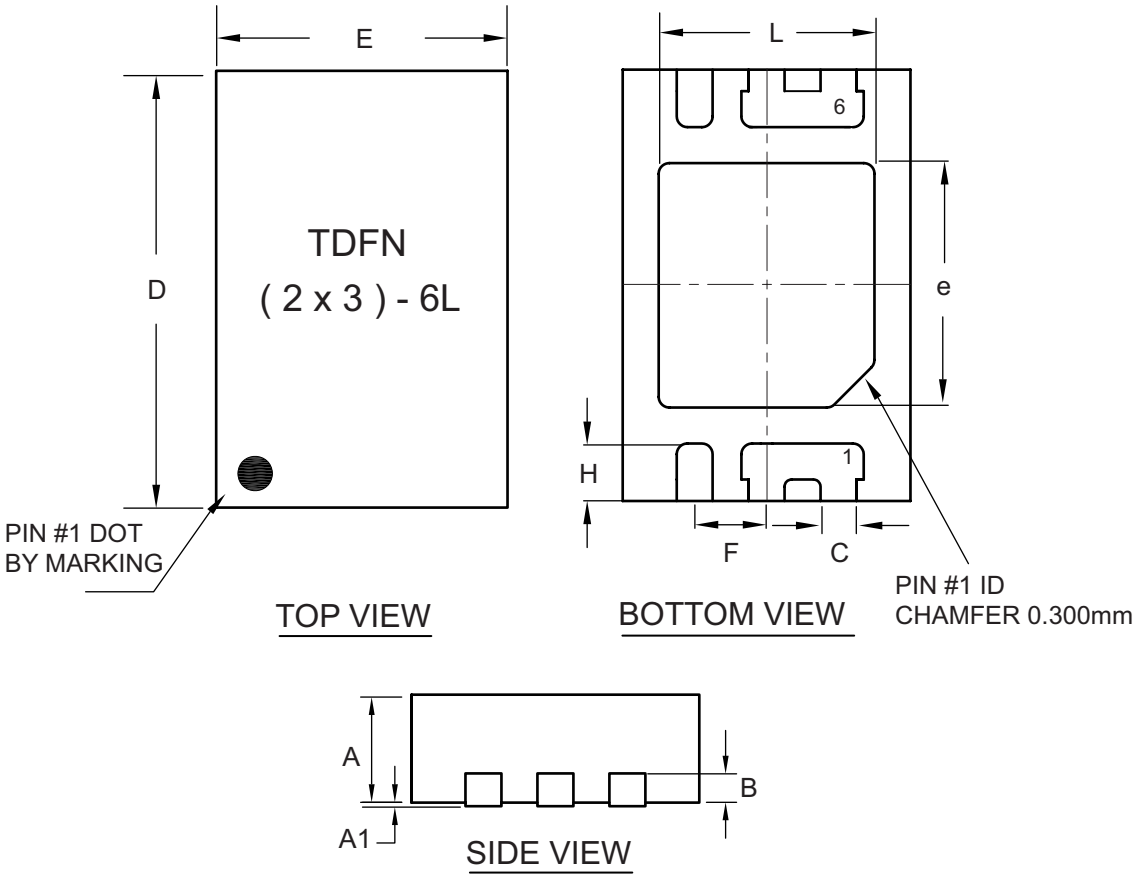


SOURCE TO DRAIN DIODE FORWARD VOLTAGE



PACKAGE OUTLINE DIMENSIONS

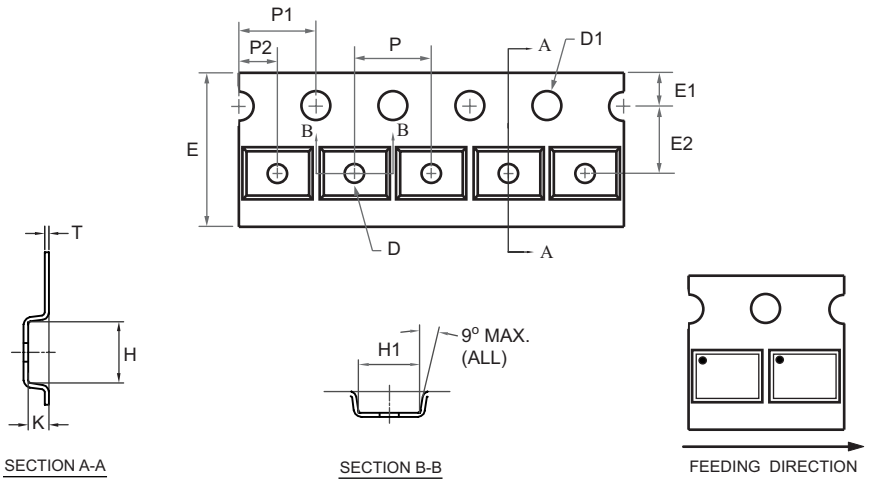
TDFN



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
D	2.950	3.050	0.116	0.120
E	1.950	2.050	0.077	0.081
H	0.350	0.450	0.014	0.018
L	1.450	1.550	0.057	0.061
e	1.650	1.750	0.065	0.069
B	0.195	0.211	0.0076	0.008
C	0.200	0.300	0.008	0.012
F	0.500 BSC		0.020 BSC	

TDFN 2x3-6L Tape and Reel Data

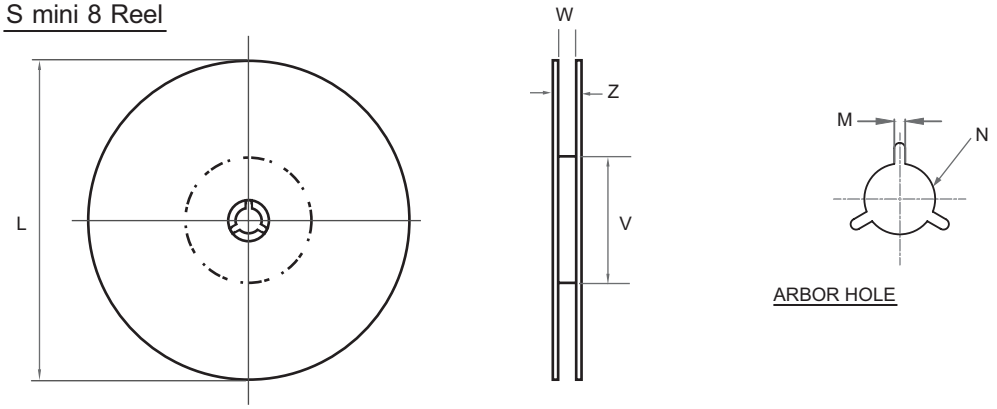
TDFN 2x3-6L Tape



UNIT : mm

PACKAGE	D	D1	E	E1	E2	H	H1	K	P	P1	P2	T
TDFN 2x3-6L	ϕ 1.00 +0.25 −0.00	ϕ 1.50 +0.10 −0.00	8.00 +0.30 −0.10	1.75 ±0.10	3.50 ±0.05	2.31 ±0.10	3.29 ±0.10	1.10 ±0.10	4.00 ±0.10	4.00 ±0.10	2.00 ±0.05	0.254 ±0.02

S mini 8 Reel



UNIT : mm

TAPE SIZE	REEL SIZE	M	N	W	V	Z	L
8 mm	7 INCH	1.5 (min)	1.28 ~ 13.5	8.4 ~ 9.9	54.5 ~ 55.5	14.4 (max)	178.5 ~ 179.5

PACKAGE OUTLINE DIMENSIONS

TDFN 2x3-6L