SamHop Microelectronics Corp.

SP2458

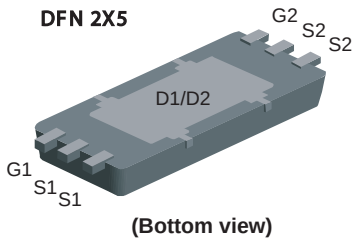
Ver 3.0

Dual N-Channel Enhancement Mode Field Effect Transistor

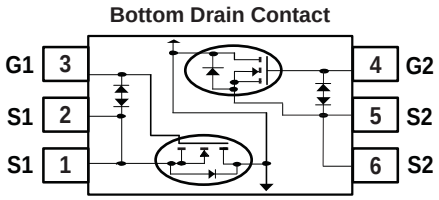
PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Max
20V	10A	8.3 @ VGS=4.5V
		8.6 @ VGS=3.9V
		9.0 @ VGS=3.5V
		10.0 @ VGS=3.1V
		12.5 @ VGS=2.5V

FEATURES

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



(Bottom view)



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	10	A
		T_A=70°C	8	A
I_{DM}	-Pulsed [a c]		85	A
P_D	Maximum Power Dissipation	T_A=25°C	1.7	W
		T_A=70°C	1	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	75	°C/W

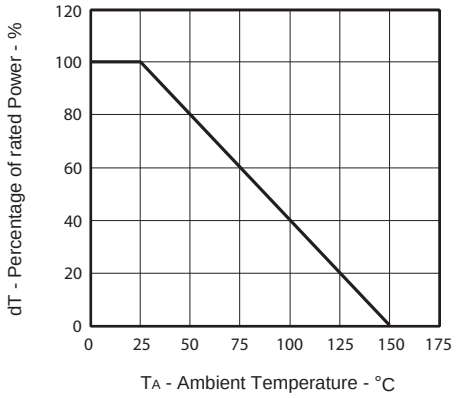
ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

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}=20V , V_{GS}=0V			1	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}= ±10V , V_{DS}=0V			±10	uA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=250uA	0.4	0.7	1.2	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=4.5V , I_D=10A	5.2	6.8	8.3	m ohm
		V_{GS}=3.9V , I_D=10A	5.5	7.1	8.6	m ohm
		V_{GS}=3.5V , I_D=9A	6.0	7.3	9.0	m ohm
		V_{GS}=3.1V , I_D=9A	6.5	8.0	10.0	m ohm
		V_{GS}=2.5V , I_D=8A	7.5	10.0	12.5	m ohm
g_{FS}	Forward Transconductance	V_{DS}=5V , I_D=10A		22		S
DYNAMIC CHARACTERISTICS [b]						
C_{ISS}	Input Capacitance	V_{DS}=10V,V_{GS}=0V f=1.0MHz		290		pF
C_{OSS}	Output Capacitance			246		pF
C_{RSS}	Reverse Transfer Capacitance			31		pF
SWITCHING CHARACTERISTICS [b]						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=10V I_D=10A V_{GS}=4.5V R_{GEN}= 3 ohm		147		ns
t_r	Rise Time			680		ns
$t_{D(OFF)}$	Turn-Off Delay Time			1872		ns
t_f	Fall Time			1260		ns
Q_g	Total Gate Charge	V_{DS}=10V,I_D=10A, V_{GS}=4.5V		14.0		nC
Q_{gs}	Gate-Source Charge			2.4		nC
Q_{gd}	Gate-Drain Charge			7.2		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=1A		0.72	1.2	V

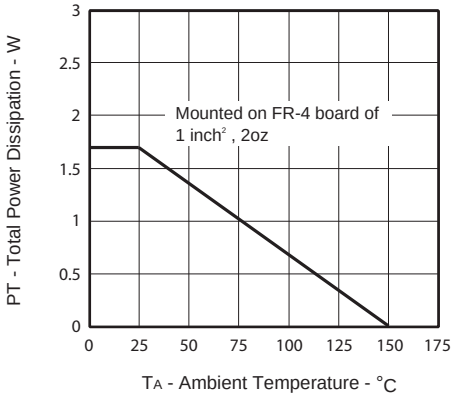
Notes

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.

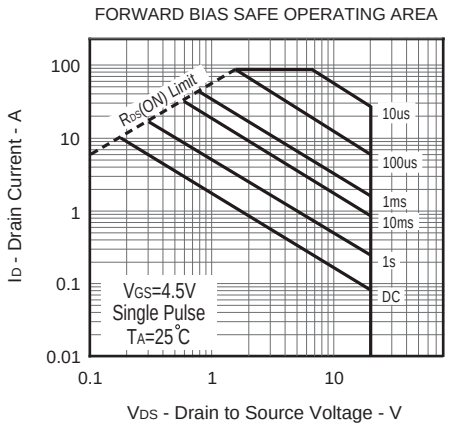
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



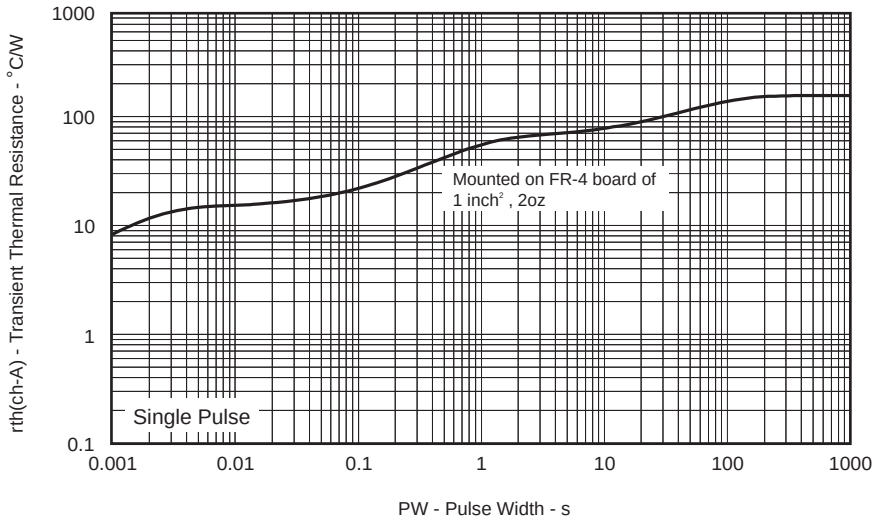
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE

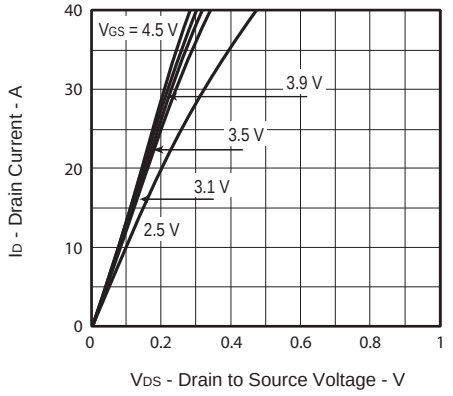


FORWARD BIAS SAFE OPERATING AREA

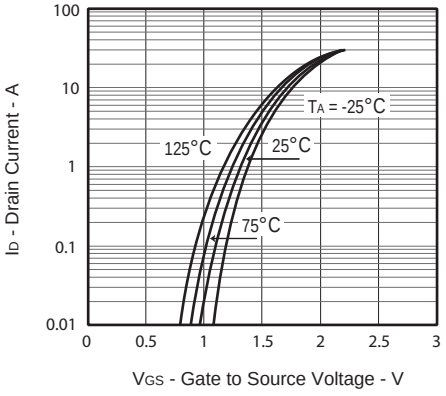


TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH

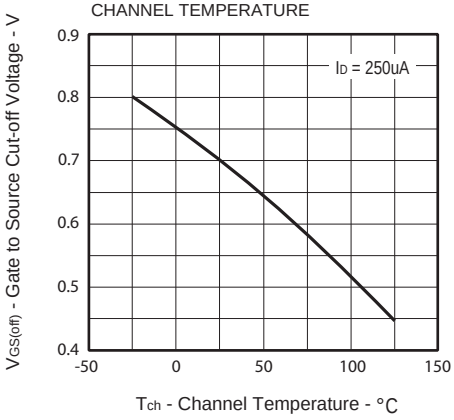




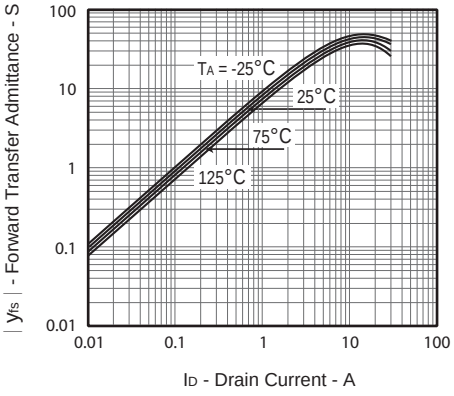
FORWARD TRANSFER CHARACTERISTICS



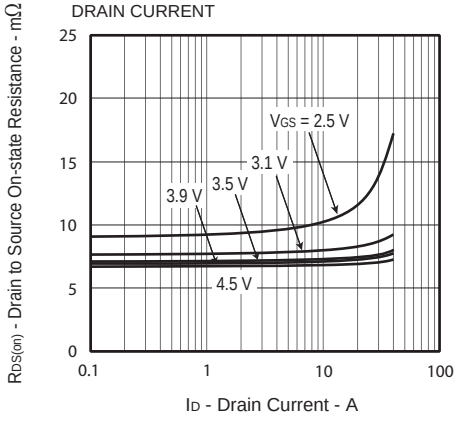
GATEBTO SOURE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



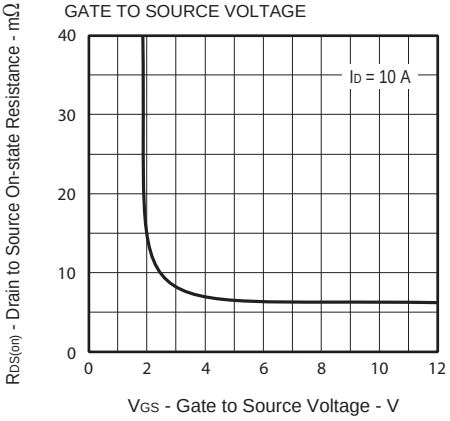
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



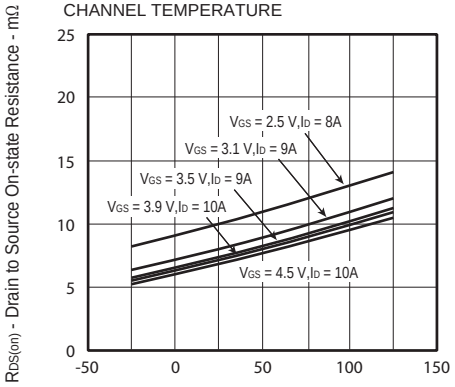
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



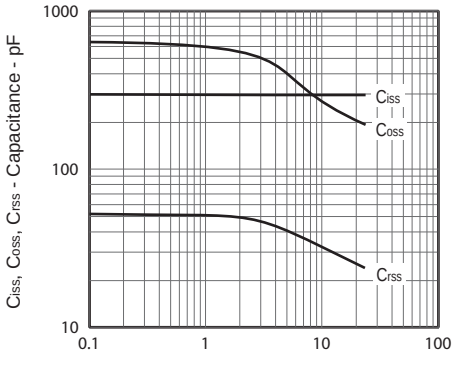
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



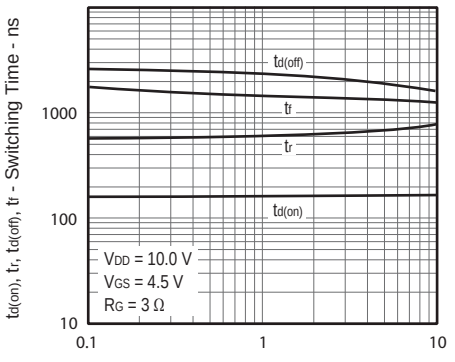
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



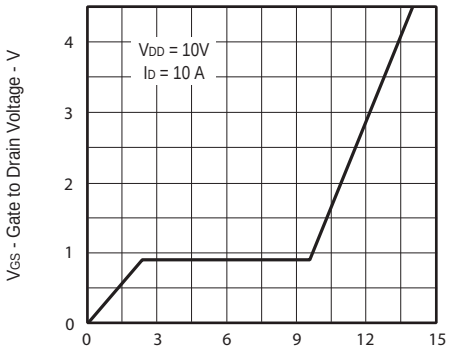
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



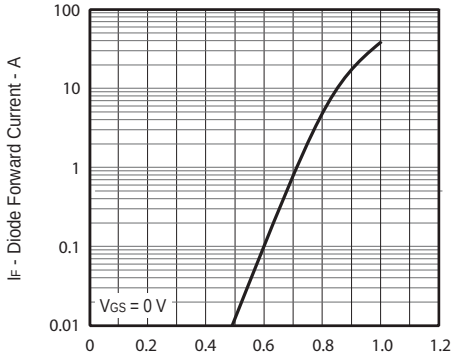
SWITCHING CHARACTERISTICS



DYNAMIC INPUT CHARACTERISTICS

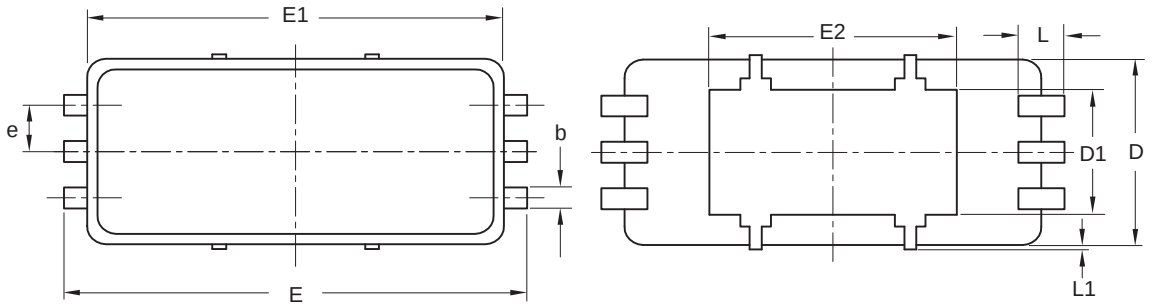


SOURCE TO DRAIN DIODE FORWARD VOLTAGE



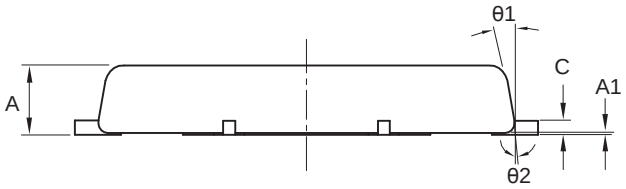
PACKAGE OUTLINE DIMENSIONS

DFN 2x5-6L



TOP VIEW

BOTTOM VIEW



SIDE VIEW

SYMBOLS	MILLIMETERS		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	—	0.05
b	0.20	0.225	0.30
C	0.10	0.152	0.20
D		2.00 BSC	
D1	1.30	1.35	1.55
E		5.00 BSC	
E1		4.50 BSC	
E2	2.60	2.67	2.95
e		0.50 BSC	
L	0.40	0.50	0.60
L1	0.00	—	0.10
θ1	0°	10°	12°
θ2		3° BSC	

TOP MARKING DEFINITION

DFN 2x5-6L