SamHop Microelectronics Corp.

SP8651

Ver 3.8

Dual N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Max
24V	10A	14.0 @ VGS=4.5V
		15.0 @ VGS=4.0V
		16.0 @ VGS=3.7V
		17.5 @ VGS=3.1V
		21.0 @ VGS=2.5V

FEATURES

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

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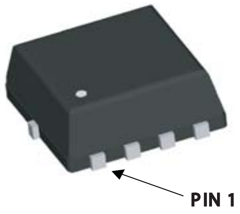
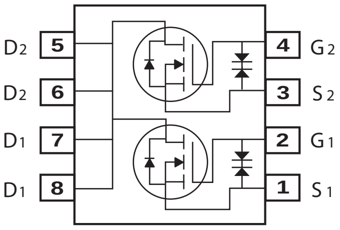




ABSOLUTE MAXIMUM RATINGS (T_A=25°C unless otherwise noted)

Symbol	Parameter		Limit	Units
V_{DS}	Drain-Source Voltage		24	V
V_{GS}	Gate-Source Voltage		±12	V
I_D	Drain Current-Continuous [a d]	T_A=25°C	10	A
		T_A=70°C	8	A
I_{DM}	-Pulsed [d]		60	A
E_{AS}	Single Pulse Avalanche Energy [c]		56	mJ
P_D	Maximum Power Dissipation [a]	T_A=25°C	1.32	W
		T_A=70°C	0.84	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 [a]	95	°C/W

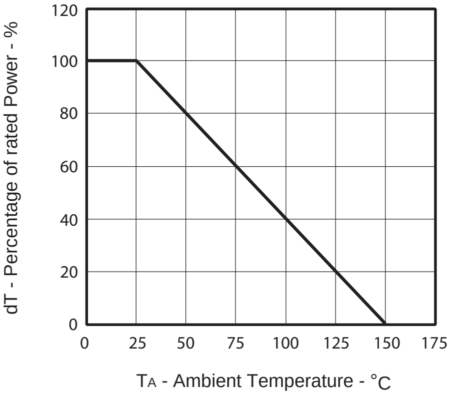
ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	24			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V , 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=1mA	0.5	1.1	1.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=4.5V , I_D=5A	8.0	11.5	14.0	m ohm
		V_{GS}=4.0V , I_D=5A	8.5	12.0	15.0	m ohm
		V_{GS}=3.7V , I_D=5A	9.0	12.5	16.0	m ohm
		V_{GS}=3.1V , I_D=5A	9.5	13.5	17.5	m ohm
		V_{GS}=2.5V , I_D=5A	11.0	16.0	21.0	m ohm
g_{FS}	Forward Transconductance	V_{DS}=10V , I_D=5A		28		S
SWITCHING CHARACTERISTICS [b]						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=20V I_D=5A V_{GS}=4.5V R_{GEN}= 6 ohm		122		ns
t_r	Rise Time			463		ns
$t_{D(OFF)}$	Turn-Off Delay Time			1200		ns
t_f	Fall Time			920		ns
Q_g	Total Gate Charge	V_{DS}=20V,I_D=10A, V_{GS}=4.5V		12.5		nC
Q_{gs}	Gate-Source Charge			1.7		nC
Q_{gd}	Gate-Drain Charge			6.5		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=10A		0.85	1.2	V

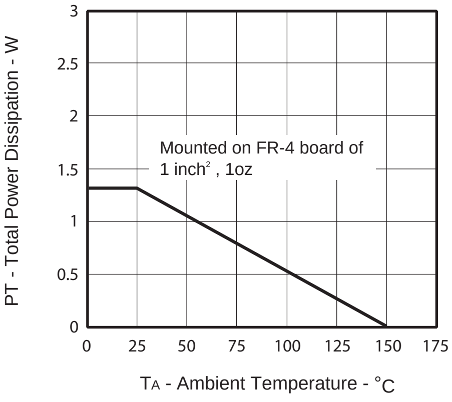
Notes

a.Surface Mounted on FR4 Board of 1 inch^2 , 1oz.
b.Guaranteed by design, not subject to production testing.
c.Starting T_J=25°C,L=0.5mH,V_{DD} = 10V.
d.Drain current limited by maximum junction temperature.

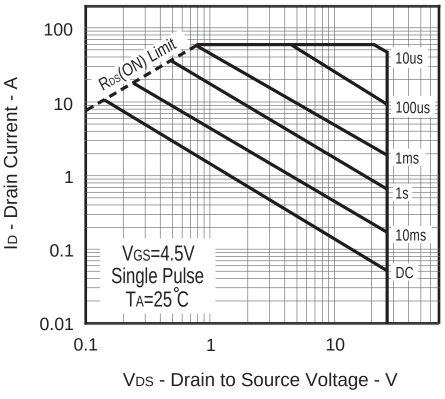
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



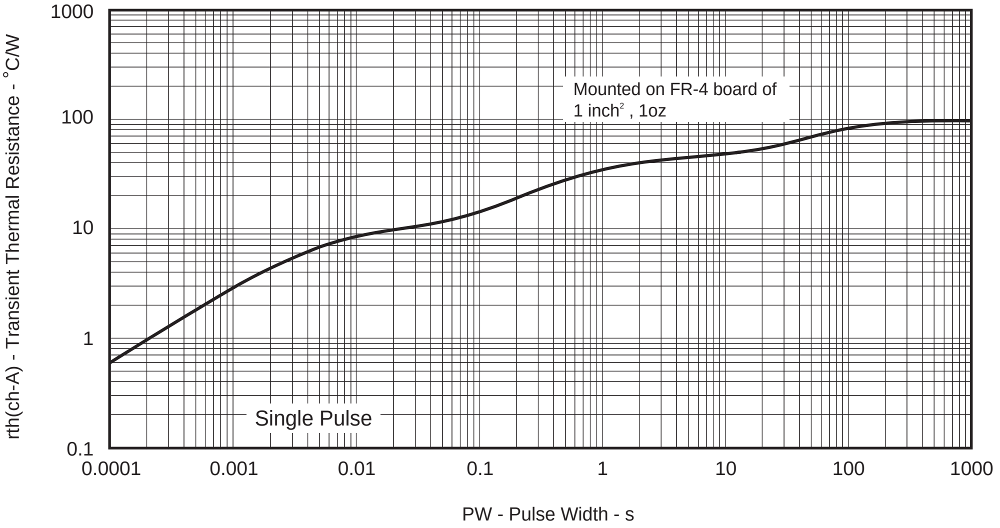
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



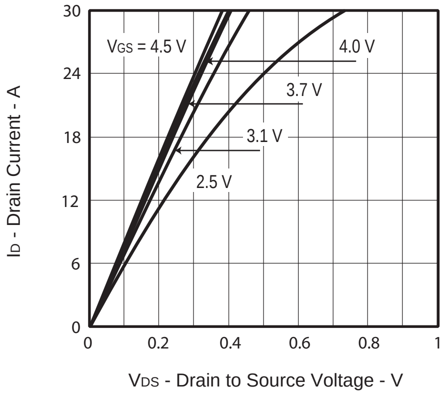
FORWARD BIAS SAFE OPERATING AREA



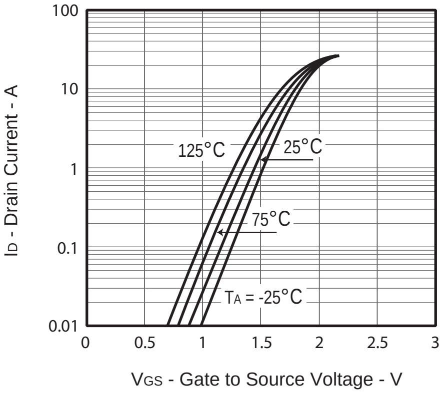
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



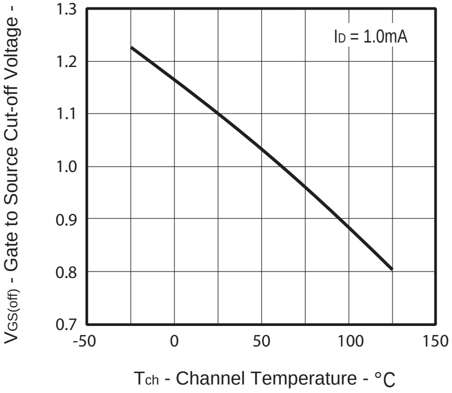
DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



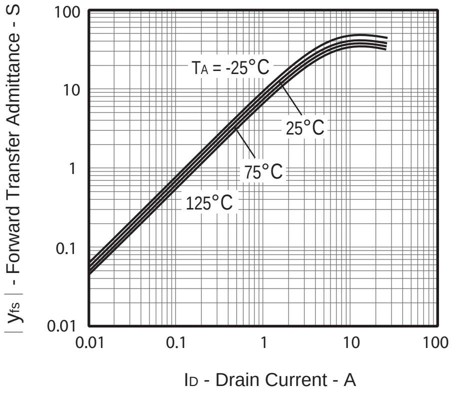
FORWARD TRANSFER CHARACTERISTICS



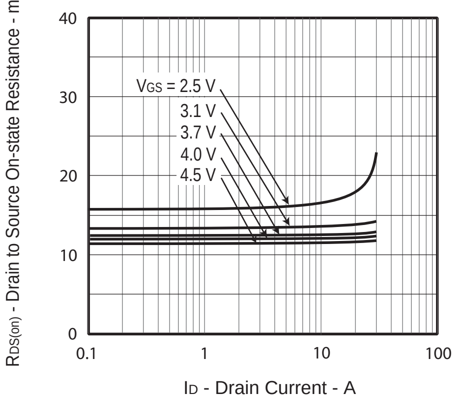
GATEBTO SOURE CUT-OFF VOLTAGE vs.
CHANNEL TEMPERATURE



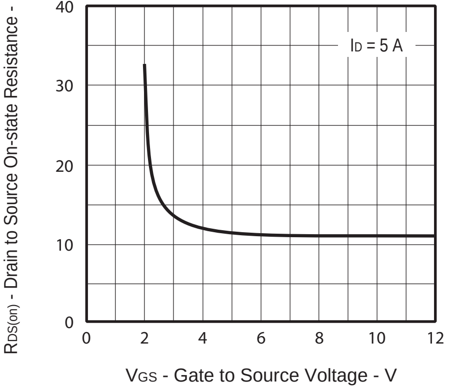
FORWARD TRANSFER ADMITTANCE vs.
DRAIN CURRENT



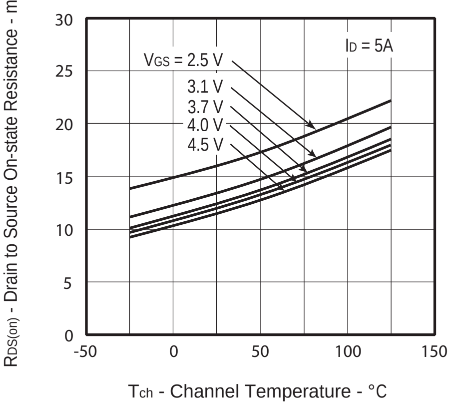
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
DRAIN CURRENT



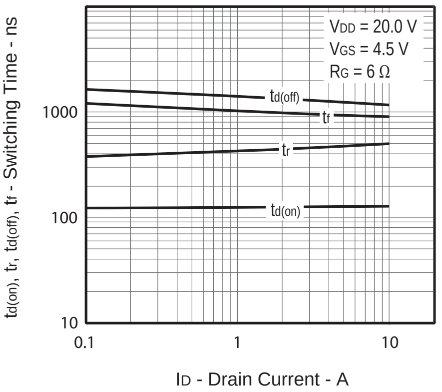
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



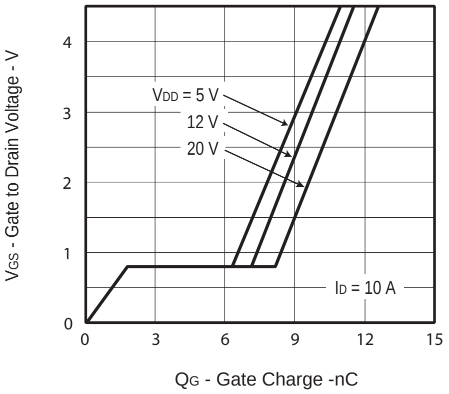
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



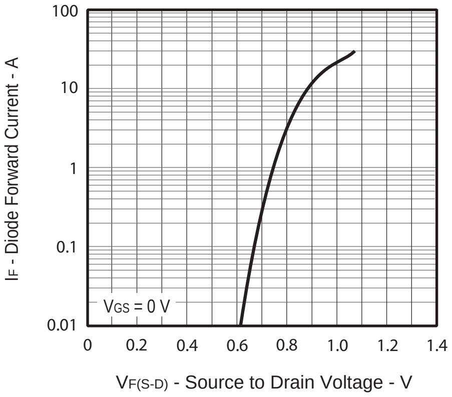
SWITCHING CHARACTERISTICS



DYNAMIC INPUT CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



PACKAGE OUTLINE DIMENSIONS

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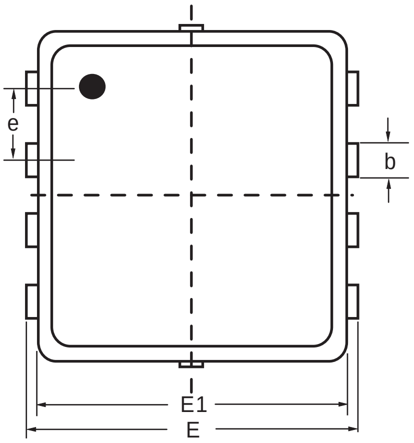
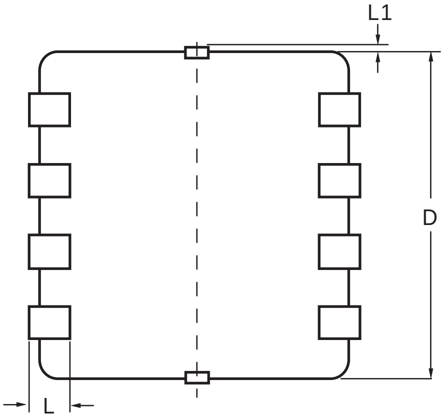
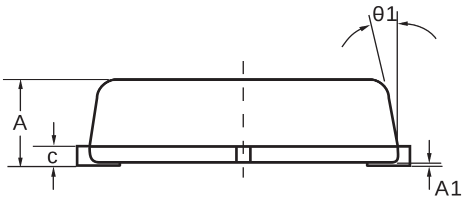


TOP VIEW



BOTTOM VIEW



SIDE VIEW

SYMBOLS	MILLIMETERS		
	MIN	NOM	MAX
A	0.700	0.800	0.900
A1	0.000	——	0.050
b	0.240	0.300	0.350
c	0.080	0.152	0.250
D	2.800	2.900	3.000
E	2.700	2.800	2.900
E1	2.200	2.300	2.400
e	0.650 BSC		
L	0.200	0.375	0.450
L1	0.000	——	0.100
θ1	0°	10°	12°

TOP MARKING DEFINITION

S mini 8