SamHop Microelectronics Corp.

SP8079E

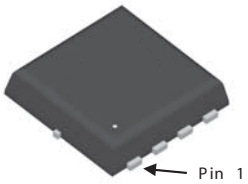
Ver 1.3

N-Channel Enhancement Mode Field Effect Transistor

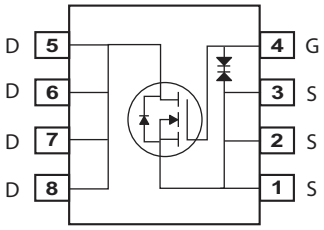
PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (m) Typ
30V	75A	1.2 @ VGS=10V
		1.5 @ VGS=6V
		1.7 @ VGS=4.5V

FEATURES

- Super high dense cell design for low $R_{DS(ON)}$.
- Rugged and reliable.
- Suface Mount Package.
- ESD Protected. (Class 3A > 4KV)



TSON 3.3 x 3.3



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

Symbol	Parameter		Limit	Units
V_{DS}	Drain-Source Voltage		30	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Drain Current-Continuous [c]	T_A=25°C	45	A
		T_A=70°C	35	A
		T_C=25°C	75	A
		T_C=70°C	59	A
I_{DM}	-Pulsed [a c]	T_A=25°C	120	A
		T_C=25°C	250	A
P_D	Maximum Power Dissipation	T_A=25°C	1.67	W
		T_A=70°C	1.07	W
		T_C=25°C	30	W
		T_C=70°C	19	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		-55 to 150	°C

THERMAL CHARACTERISTICS

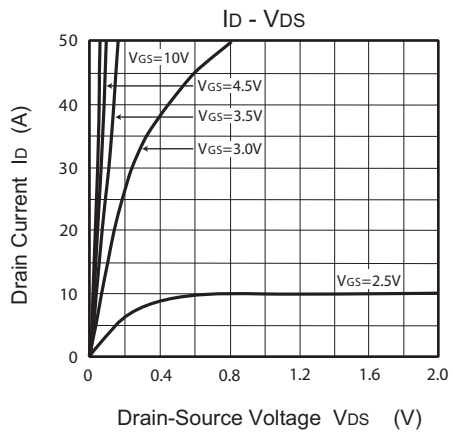
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	55	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.5	°C/W

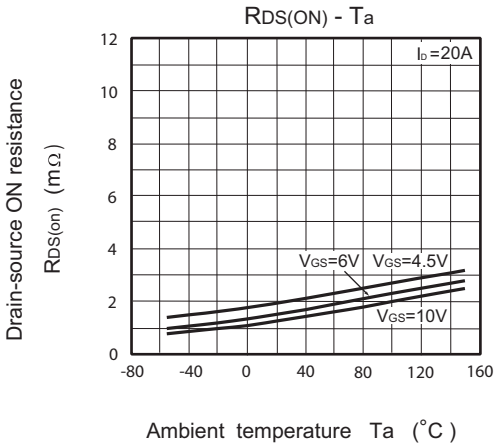
ELECTRICAL CHARACTERISTICS (T_C=25°C unless otherwise noted)

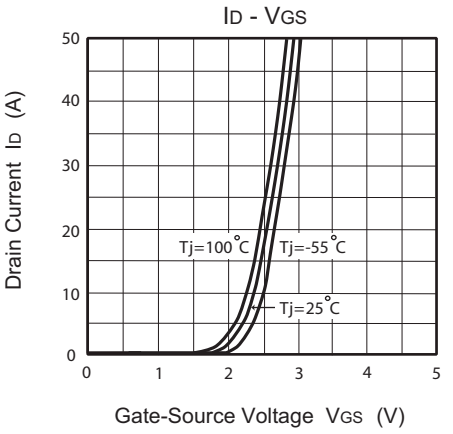
Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D= 250uA	30			V
BV_{DSX}		V_{GS}=-20V , I_D= 250uA	18			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V , V_{GS}=0V			1	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}= ±20V , V_{DS}=0V			±10	uA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=250uA	1.1	1.6	2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V , I_D=20A		1.2	1.35	m ohm
		V_{GS}=6V , I_D=20A		1.5	2.0	m ohm
		V_{GS}=4.5V , I_D=20A		1.7	2.3	m ohm
DYNAMIC CHARACTERISTICS [b]						
C_{ISS}	Input Capacitance	V_{DS}=10V,V_{GS}=0V f=1.0MHz		1030		pF
C_{OSS}	Output Capacitance			500		pF
C_{RSS}	Reverse Transfer Capacitance			180		pF
SWITCHING CHARACTERISTICS [b]						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=15V I_D=20A V_{GS}=10V R_{GEN}= 4.7 ohm		31		ns
tr	Rise Time			72		ns
$t_{D(OFF)}$	Turn-Off Delay Time			73		ns
tf	Fall Time			40		ns
Q_g(4.5V)	Total Gate Charge	V_{DS}=24V, I_D=20A ,V_{GS}=4.5V		13		nC
Q_g(10V)	Total Gate Charge	V_{DS}=24V I_D=20A V_{GS}=10V		39		nC
Q_{gs}	Gate-Source Charge			3.5		nC
Q_{gd}	Gate-Drain Charge			14		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=27A		0.73	1.3	V

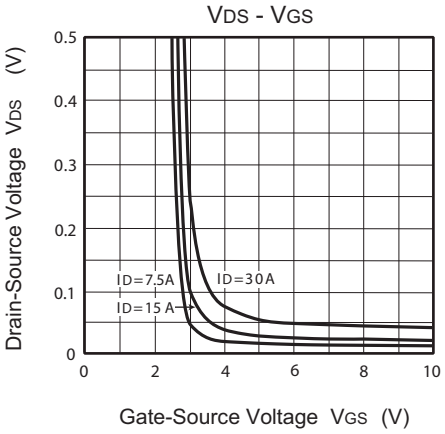
Notes

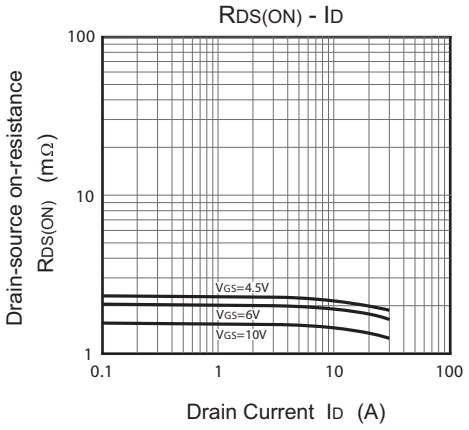
a.Pulse Test:Pulse Width ≤ 10us, Duty Cycle ≤ 1%.
b.Guaranteed by design, not subject to production testing.
c.Drain current limited by maximum junction temperature.
d.Mounted on FR4 Board of 1 inch^2 , 2oz.

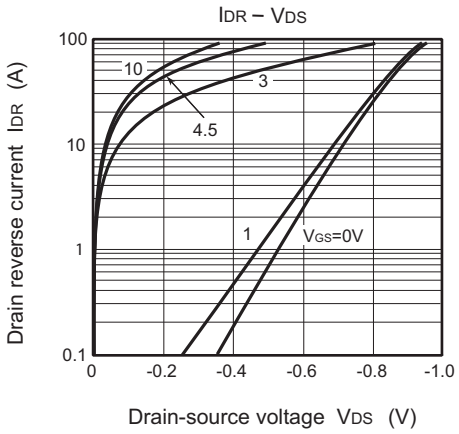

ID - VDS
Drain Current ID (A)
Drain-Source Voltage VDS (V)
VGS=10V
VGS=4.5V
VGS=3.5V
VGS=3.0V
VGS=2.5V
50
40
30
20
10
0
0
0.4
0.8
1.2
1.6
2.0

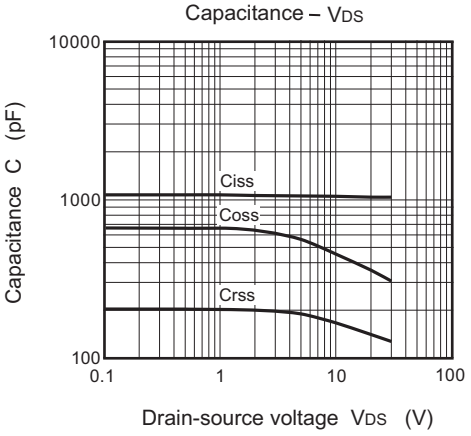

RDS(ON) - Ta
Drain-source ON resistance
RDS(on) (mΩ)
Ambient temperature Ta (°C)
ID=20A
VGS=6V
VGS=4.5V
VGS=10V
12
10
8
6
4
2
0
-80
-40
0
40
80
120
160

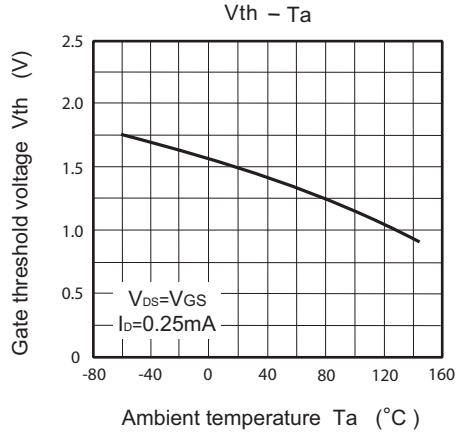

ID - VGS
Drain Current ID (A)
Gate-Source Voltage VGS (V)
Tj=100°C
Tj=-55°C
Tj=25°C
50
40
30
20
10
0
0
1
2
3
4
5

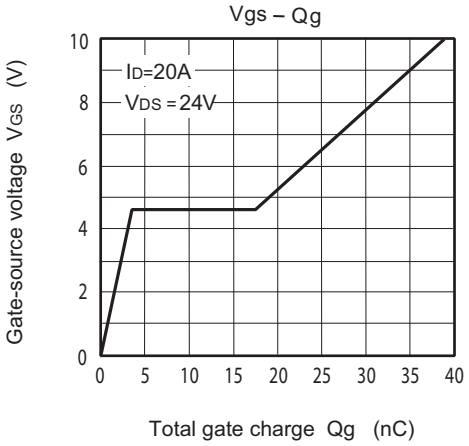

VDS - VGS
Drain-Source Voltage VDS (V)
Gate-Source Voltage VGS (V)
ID=7.5A
ID=30A
ID=15A
0.5
0.4
0.3
0.2
0.1
0
0
2
4
6
8
10

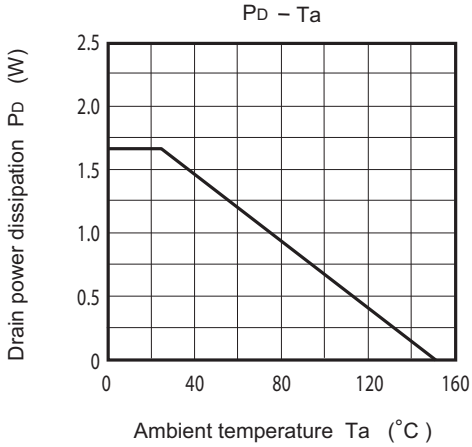

RDS(ON) - ID
Drain-source on-resistance
RDS(ON) (mΩ)
Drain Current ID (A)
VGS=4.5V
VGS=6V
VGS=10V
100
10
1
0.1
1
10
100


IDR – VDS
Drain reverse current IDR (A)
100
10
1
0.1
10
3
4.5
1
VGS=0V
0
-0.2
-0.4
-0.6
-0.8
-1.0
Drain-source voltage VDS (V)

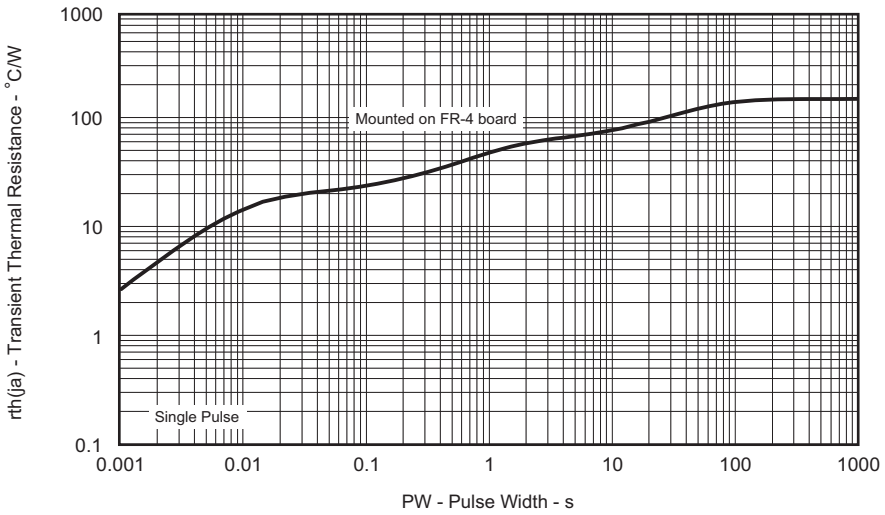

Capacitance – VDS
Capacitance C (pF)
10000
1000
100
Ciss
Coss
Crss
0.1
1
10
100
Drain-source voltage VDS (V)


Vth – Ta
Gate threshold voltage Vth (V)
2.5
2.0
1.5
1.0
0.5
0
VDS=VGS
ID=0.25mA
-80
-40
0
40
80
120
160
Ambient temperature Ta (°C)

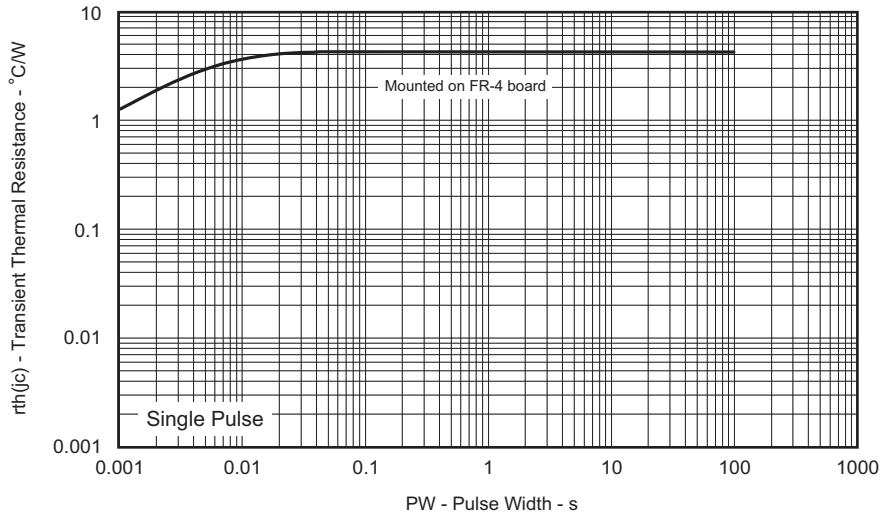

Vgs – Qg
Gate-source voltage VGS (V)
10
8
6
4
2
0
ID=20A
VDS = 24V
0
5
10
15
20
25
30
35
40
Total gate charge Qg (nC)


PD – Ta
Drain power dissipation PD (W)
2.5
2.0
1.5
1.0
0.5
0
0
40
80
120
160
Ambient temperature Ta (°C)

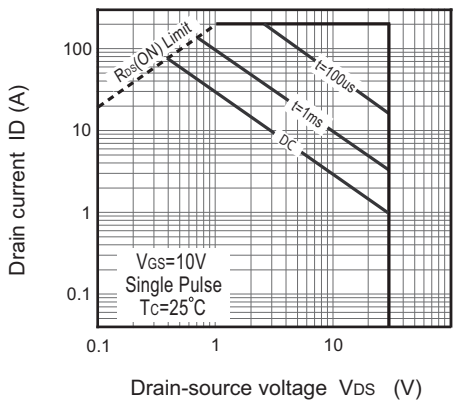
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH

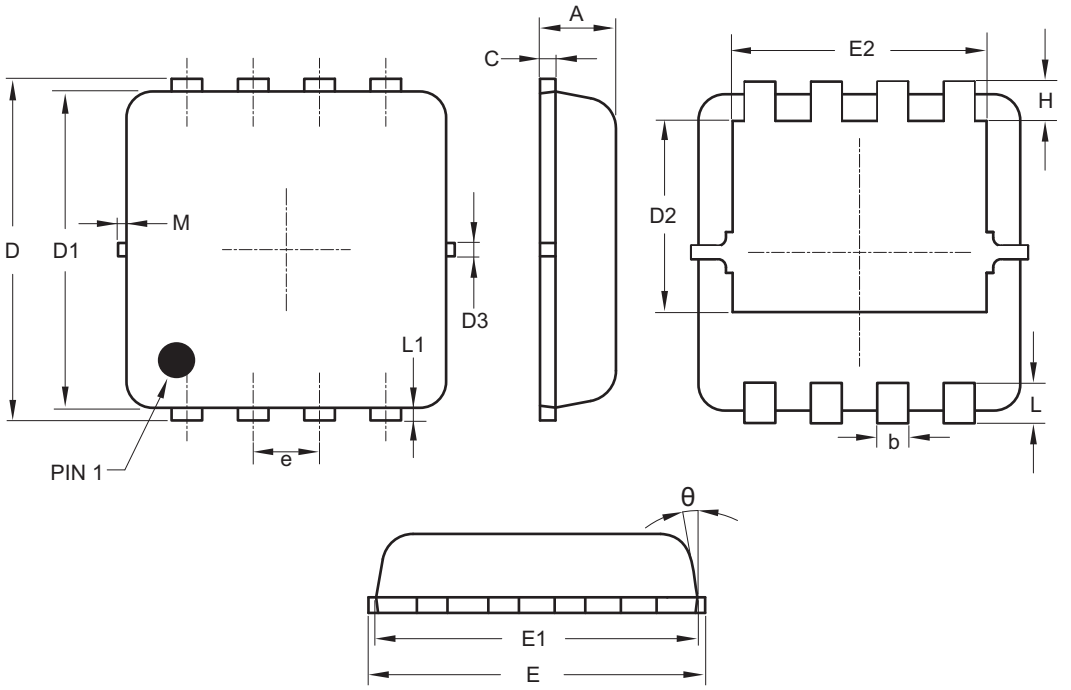


Safe operating area



PACKAGE OUTLINE DIMENSIONS

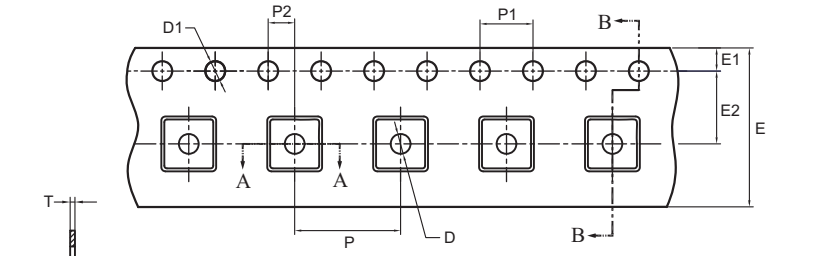
TSON 3.3 x 3.3

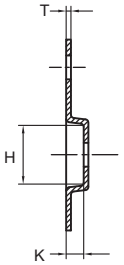


SYMBOLS	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.70	0.75	0.85
b	0.25	0.30	0.35
C	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
D3	—	0.13	—
E	3.20	3.30	3.40
E1	3.00	3.15	3.25
E2	2.39	2.49	2.64
e	0.65 BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	—	0.13	—
M	—	—	0.15
θ	—	10°	12°

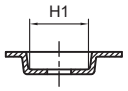
TSON 3.3 x 3.3 Tape and Reel Data

TSON 3.3 x 3.3 Tape

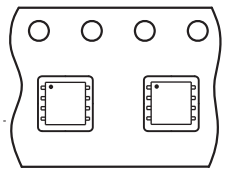




SECTION B-B



SECTION A-A

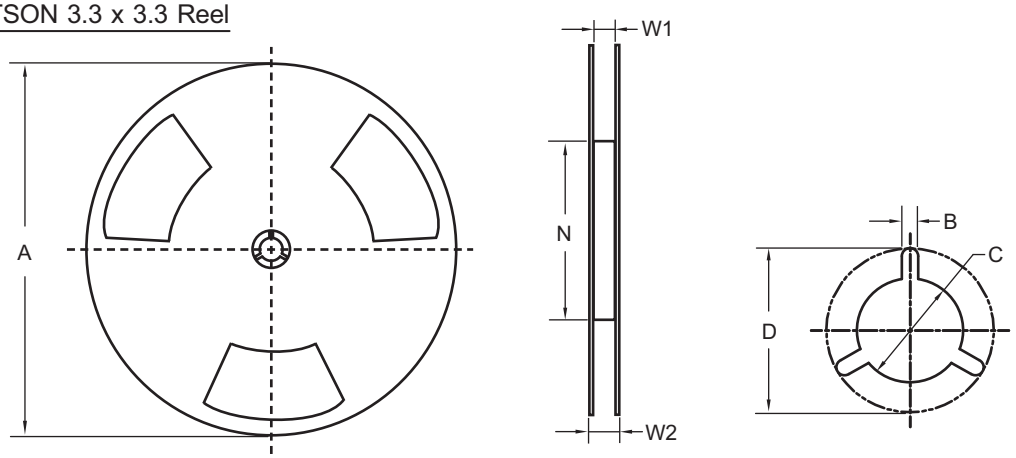


FEEDING DIRECTION

unit:

PACKAGE	D	D1	E	E1	E2	H	H1	K	P	P1	P2	T
S mini 8	1.50 (MIN)	1.50 +0.10 - 0.00	12.0 +0.30 - 0.10	1.75 0.10	5.50 0.05	3.70 0.10	3.70 0.10	1.10 0.10	8.0 0.10	4.0 0.10	2.0 0.05	0.3 0.05

TSON 3.3 x 3.3 Reel



UNIT:

TAPE SIZE	REEL SIZE	A	B	C	D	N	W1	W2
12	13 "	330 1.0	1.5 $^{+0.5}_{-0.2}$	13.0 $^{+0.5}_{-0.2}$	20.2(ref.)	178 $^{+0.0}_{-2.0}$	12.4 $^{+2.0}_{-0.0}$	18.4(ref.)

TOP MARKING DEFINITION

TSON 3.3 x 3.3