SamHop Microelectronics Corp.

SP8008

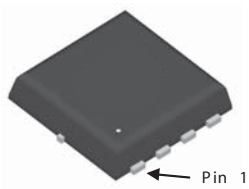
Ver 1.0

N-Channel Enhancement Mode Field Effect Transistor

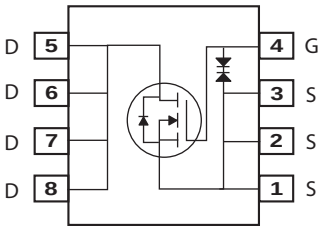
PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Typ
30V	28A	3.9 @ VGS=10V
		4.2 @ VGS=4.5V
		5.2 @ VGS=2.5V

FEATURES

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



TSON 3.3 x 3.3



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

Symbol	Parameter		Limit	Units
V_{DS}	Drain-Source Voltage		30	V
V_{GS}	Gate-Source Voltage		±12	V
I_D	Drain Current-Continuous	T_A=25°C	28	A
I_{DM}	-Pulsed [a]		84	A
E_{AS}	Single Pulse Avalanche Energy [c]		182	mJ
P_D	Maximum Power Dissipation	T_A=25°C	1.67	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		-55 to 150	°C

THERMAL CHARACTERISTICS

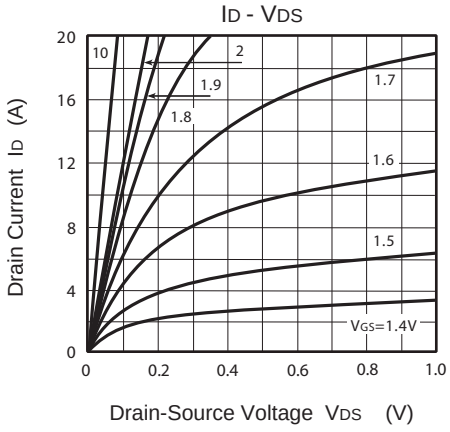
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	75	°C/W

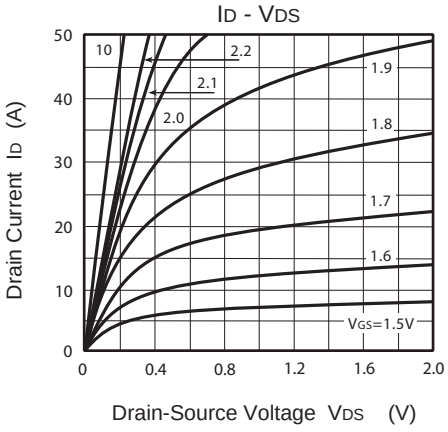
ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

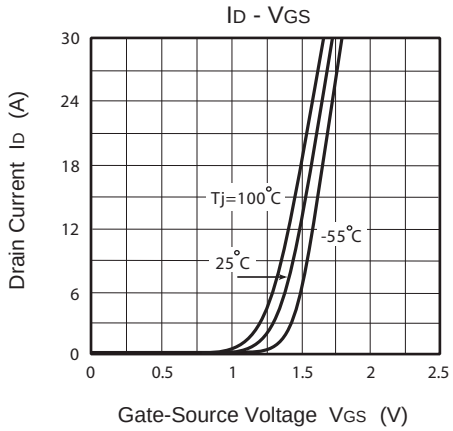
Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	30			V
BV_{DSX}		V_{GS}=-20V , I_D=10mA	10			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V , V_{GS}=0V			10	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}= ±12V , V_{DS}=0V			±10	uA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=0.2mA	0.5	0.8	1.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V , I_D=14A		3.9	4.9	m ohm
		V_{GS}=4.5V , I_D=14A		4.2	5.5	m ohm
		V_{GS}=2.5V , I_D=14A		5.2	7.0	m ohm
DYNAMIC CHARACTERISTICS [b]						
C_{ISS}	Input Capacitance	V_{DS}=10V,V_{GS}=0V f=1.0MHz		2600		pF
C_{OSS}	Output Capacitance			520		pF
C_{RSS}	Reverse Transfer Capacitance			445		pF
SWITCHING CHARACTERISTICS [b]						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=15V I_D=14A V_{GS}=10V R_{GEN}= 4.7 ohm		50		ns
t_r	Rise Time			64		ns
$t_{D(OFF)}$	Turn-Off Delay Time			103		ns
t_f	Fall Time			18		ns
Q_g	Total Gate Charge	V_{DS}=24V,I_D=28A,V_{GS}=10V		47		nC
Q_{gs}	Gate-Source Charge	V_{DS}=24V,I_D=28A, V_{GS}=10V		8.6		nC
Q_{gd}	Gate-Drain Charge			5.5		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=28A		0.83	1.3	V

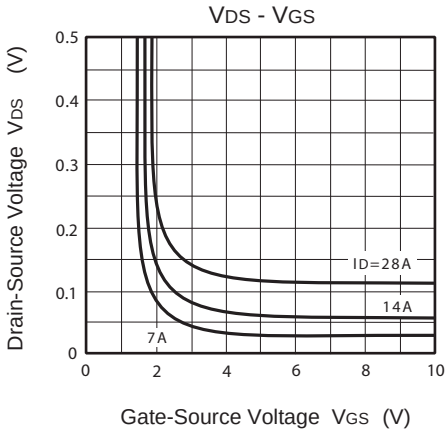
Notes

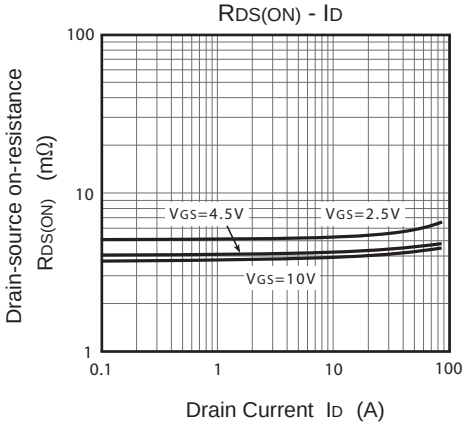
a.Pulse Test:Pulse Width ≤ 300us, Duty Cycle ≤ 2%.
b.Guaranteed by design, not subject to production testing.
c.Starting T_J=25°C,L=0.5mH,V_{DD} = 20V.

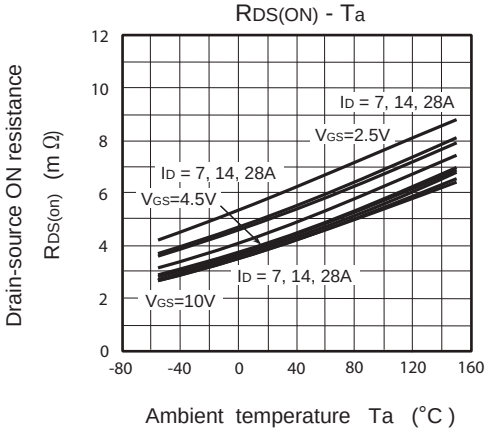

ID - VDS
Drain Current ID (A)
Drain-Source Voltage VDS (V)
10
2
1.9
1.8
1.7
1.6
1.5
VGS=1.4V

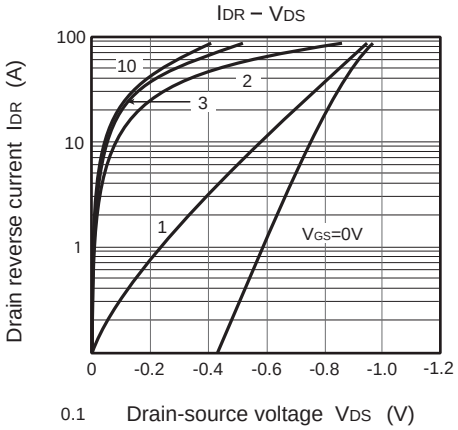

ID - VDS
Drain Current ID (A)
Drain-Source Voltage VDS (V)
10
2.2
2.1
2.0
1.9
1.8
1.7
1.6
VGS=1.5V

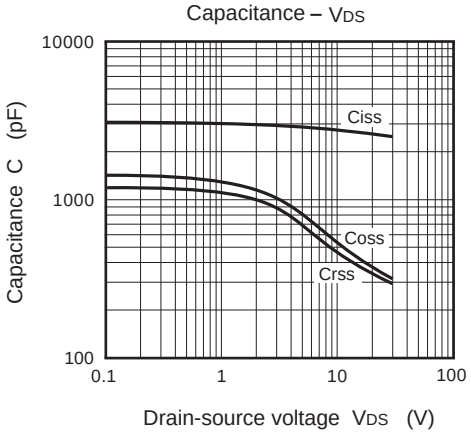

ID - VGS
Drain Current ID (A)
Gate-Source Voltage VGS (V)
Tj=100°C
-55°C
25°C

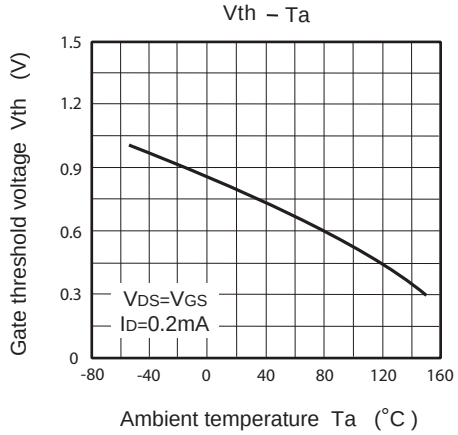

VDS - VGS
Drain-Source Voltage VDS (V)
Gate-Source Voltage VGS (V)
ID=28A
14A
7A

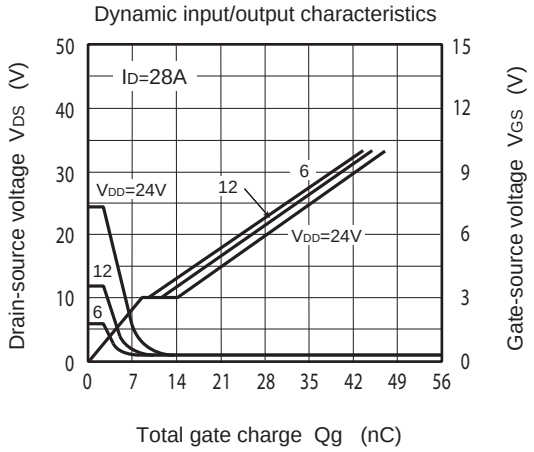

RDS(ON) - ID
Drain-source on-resistance RDS(ON) (mΩ)
Drain Current ID (A)
VGS=4.5V
VGS=2.5V
VGS=10V

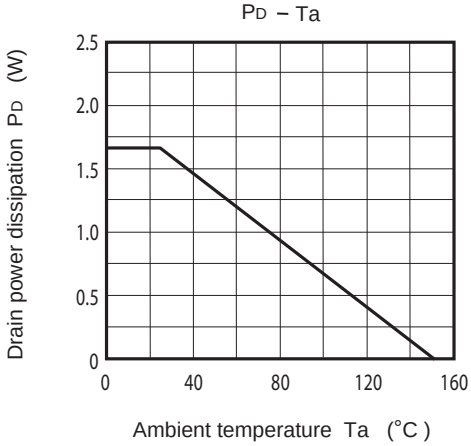

RDS(ON) - Ta
Drain-source ON resistance RDS(on) (m Ω)
Ambient temperature Ta (°C)
ID = 7, 14, 28A
VGS=2.5V
ID = 7, 14, 28A
VGS=4.5V
ID = 7, 14, 28A
VGS=10V


IDR – VDS
Drain reverse current IDR (A)
100
10
1
0.1
10
2
3
1
VGS=0V
0
-0.2
-0.4
-0.6
-0.8
-1.0
-1.2
Drain-source voltage VDS (V)

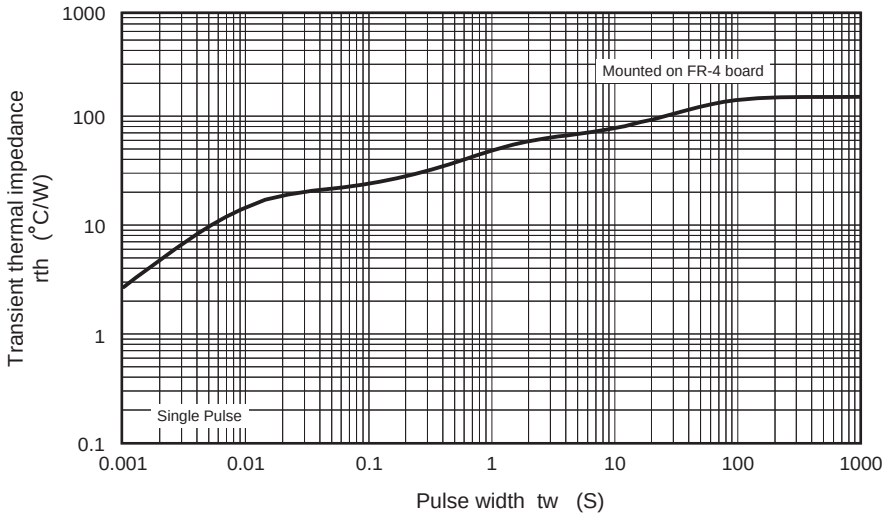

Capacitance – VDS
Capacitance C (pF)
10000
1000
100
Ciss
Coss
Crss
0.1
1
10
100
Drain-source voltage VDS (V)


Vth – Ta
Gate threshold voltage Vth (V)
1.5
1.2
0.9
0.6
0.3
0
VDS=VGS
ID=0.2mA
-80
-40
0
40
80
120
160
Ambient temperature Ta (°C)

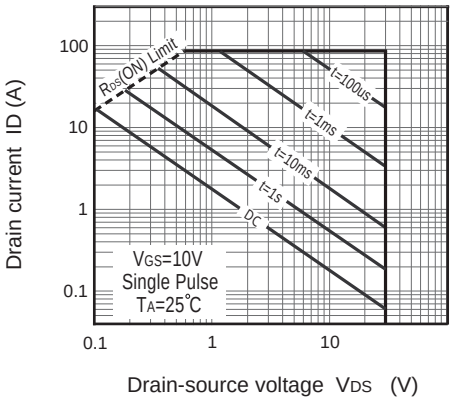

Dynamic input/output characteristics
Drain-source voltage VDS (V)
Gate-source voltage VGS (V)
50
40
30
20
10
0
15
12
9
6
3
0
ID=28A
VDD=24V
12
6
12
6
VDD=24V
0
7
14
21
28
35
42
49
56
Total gate charge Qg (nC)


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)

rth - tw

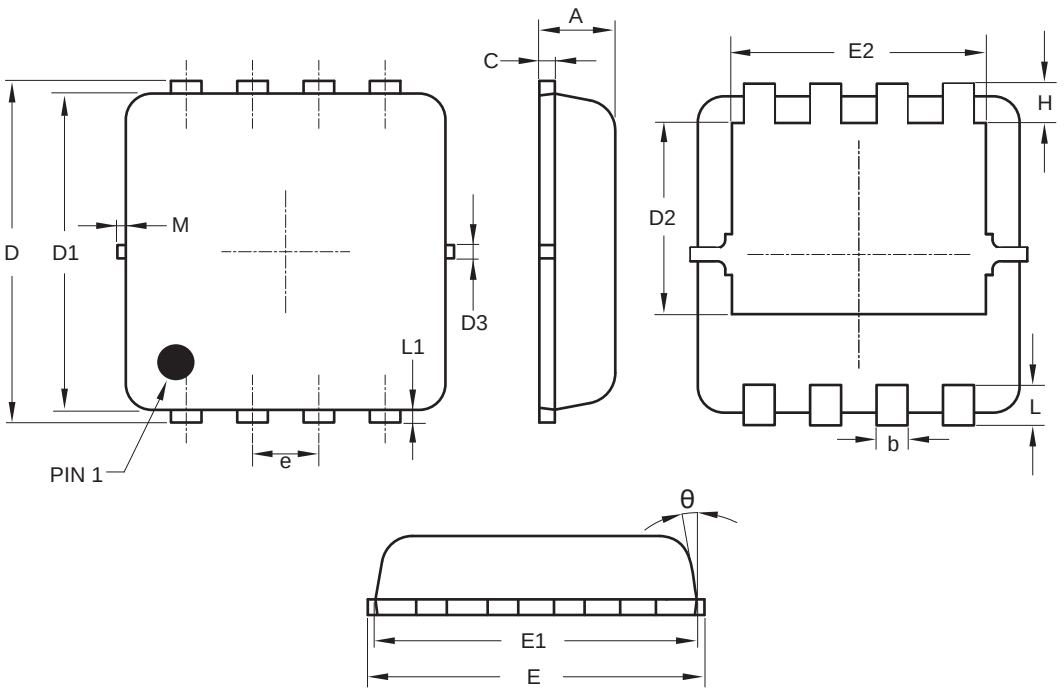


Safe operating area



PACKAGE OUTLINE DIMENSIONS

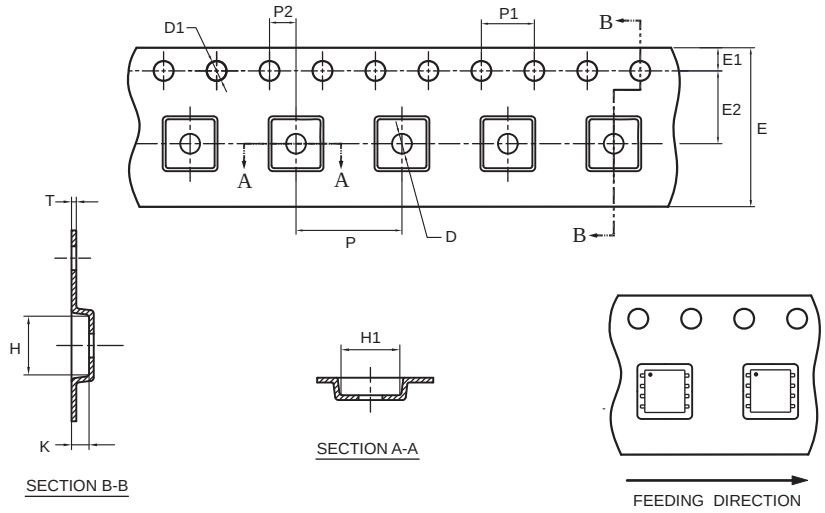
TSON 3.3 x 3.3



SYMBOLS	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.70	0.75	0.80
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	3.20
E2	2.39	2.49	2.59
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^o	12^o

TSON 3.3 x 3.3 Tape and Reel Data

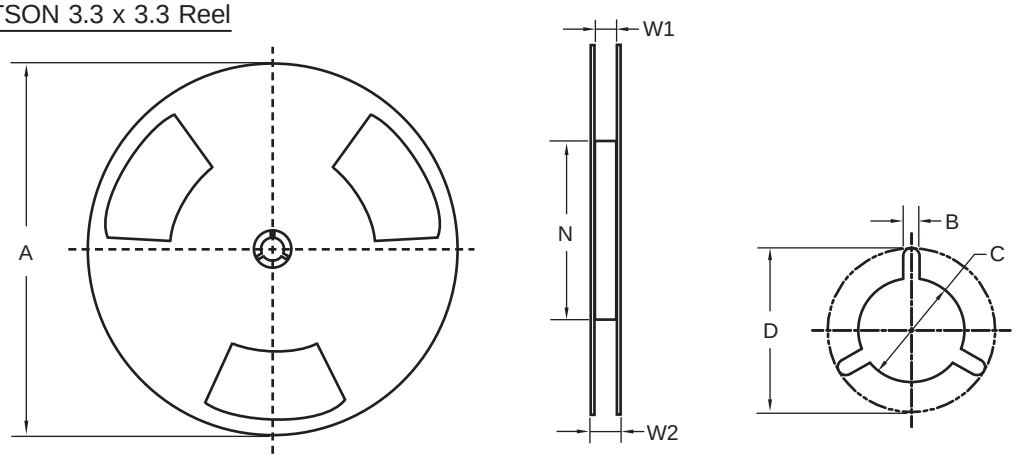
TSON 3.3 x 3.3 Tape



unit:㎜

PACKAGE	D	D1	E	E1	E2	H	H1	K	P	P1	P2	T
S mini 8	ϕ1.50 (MIN)	ϕ1.50 +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 $^{+0.5}_{-0.2}$	ϕ13.0 $^{+0.5}_{-0.2}$	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