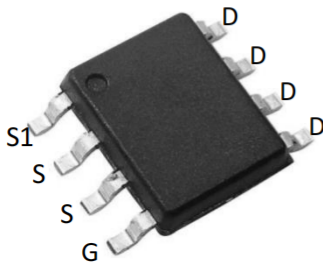


Features

The TPSI4114DY-T1-GE3 is the high cell density trench N-ch MOSFETs, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications. The

TPSI4114DY-T1-GE3 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

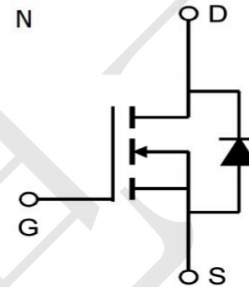
Pin Configurations



SOP-8

Product Summary

V_{DS}	30V
I_D	25A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	<6m Ω
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	<8.6m Ω



Maximum Ratings ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current, $V_{GS} @ 10V^1$	$I_{D@TA=25^\circ\text{C}}$	25	A
Continuous Drain Current, $V_{GS} @ 10V$	$I_{D@TA=70^\circ\text{C}}$	15	
Pulsed Drain Current ²	I_{DM}	80	
Single Pulse Avalanche Energy	EAS	105.8	mJ
Avalanche Current	IAS	51	A
Total Power Dissipation	$PD@TA=25^\circ\text{C}$	10	W
Storage Temperature Range	TSTG	-55 to 150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 to 150	

Thermal Data

Parameter	Symbol	Max.	Unit
Thermal Resistance Junction-ambient	$R_{\theta JA}$	85	$^\circ\text{C/W}$
Thermal Resistance Junction-Case	$R_{\theta JC}$	35	

Electrical Characteristics(T_J=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Parameters						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	30			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.0	1.5	2.5	V
Gate-Body leakage Current	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30V, V _{GS} = 0V			1	μA
Static Drain-Source On-Resistance	R _{DSON}	V _{GS} = 10V, I _D = 20A		4.6	6	mΩ
		V _{GS} = 4.5V, I _D = 10A		6.1	8.6	mΩ
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} = 15V, V _{GS} = 0V, f = 1MHz		1700		pF
Output Capacitance	C _{oss}			320		pF
Reverse Transfer Capacitance	C _{rss}			300		pF
Total Gate Charge	Q _g	V _{DS} = 15V, V _{GS} = 10V, I _D = 10A		45		nC
Gate Source Charge	Q _{gs}			3		nC
Gate Drain Charge	Q _{gd}			15		nC
Switching Parameters						
Turn-On Delay Time	t _{d(on)}	V _{DS} = 15V, I _D = 20A, R _{GEN} = 3Ω, V _{GS} = 10V		21		ns
Turn-On Rise Time	t _r			32		ns
Turn-Off Delay Time	t _{d(off)}			59		ns
Turn-Off Fall Time	t _f			34		ns
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain to Source Diode Forward Current		I _S			20	A
Maximum Pulsed Drain to Source Diode Forward Current		I _{SM}			80	
Drain to Source Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _S = 20A			1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 20A, dI/dt = 100A/μs		15		ns
Body Diode Reverse Recovery Charge	Q _{rr}				4	

Note :

1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t < 5 sec.
3. Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics

Figure 1: Output Characteristics

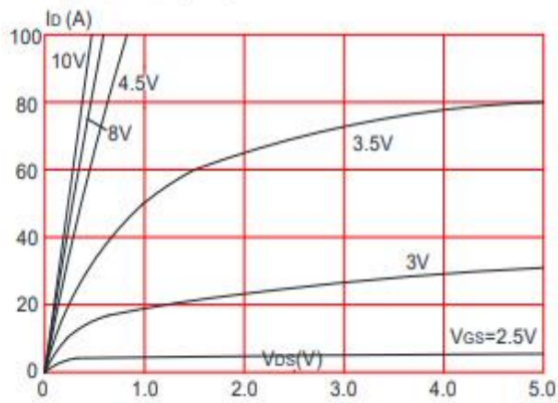


Figure 2: Typical Transfer Characteristics

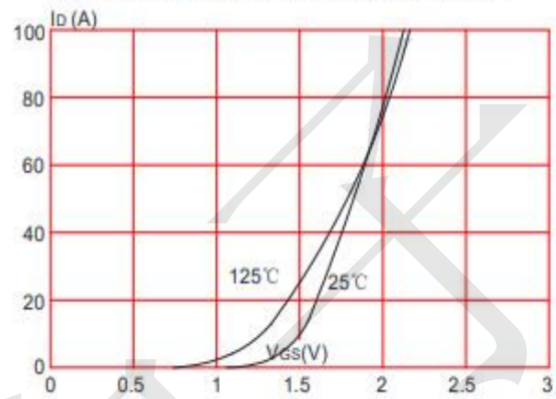


Figure 3: On-resistance vs. Drain Current

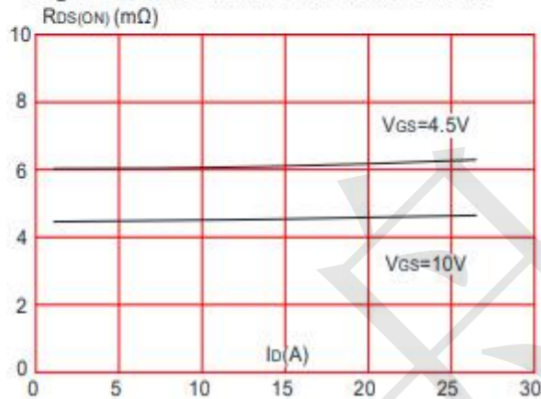


Figure 4: Body Diode Characteristics

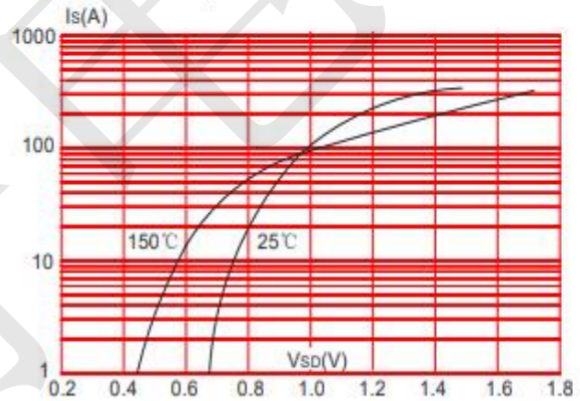


Figure 5: Gate Charge Characteristics

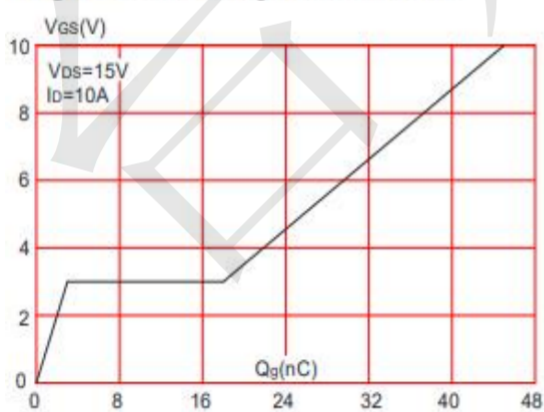


Figure 6: Capacitance Characteristics

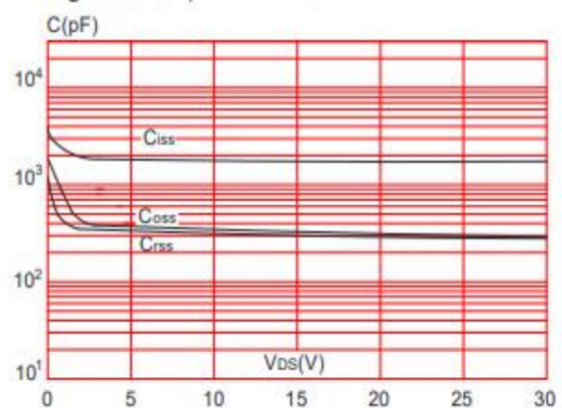


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

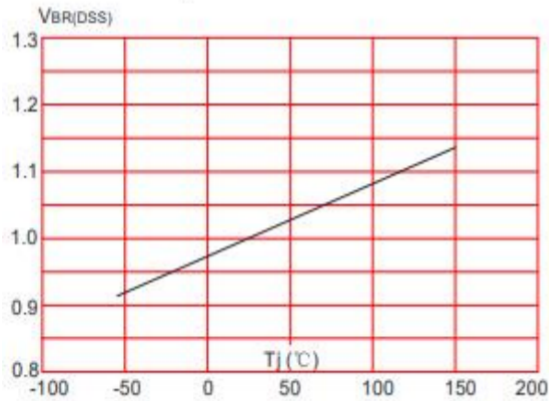


Figure 8: Normalized on Resistance vs. Junction Temperature

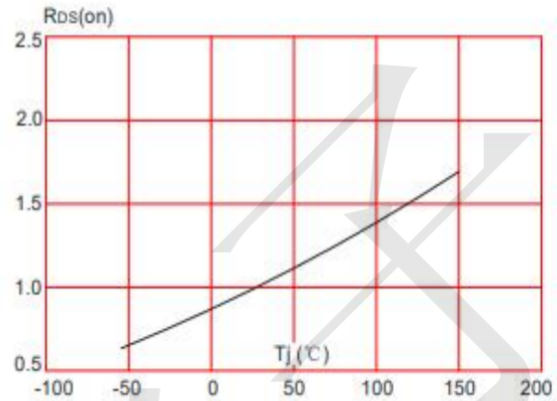


Figure 9: Maximum Safe Operating Area

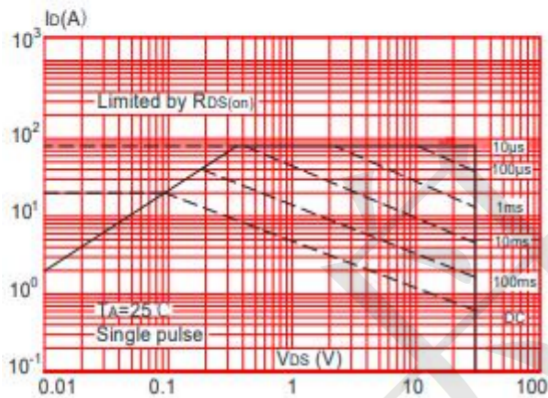


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

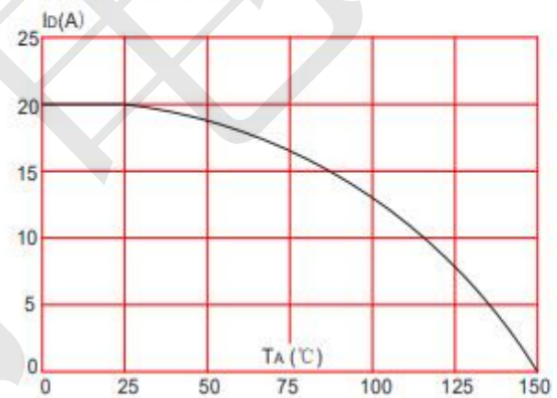
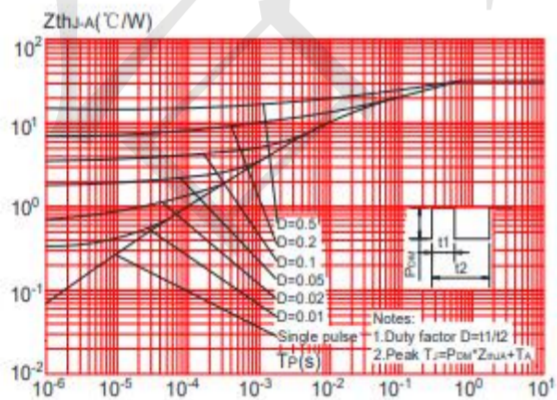
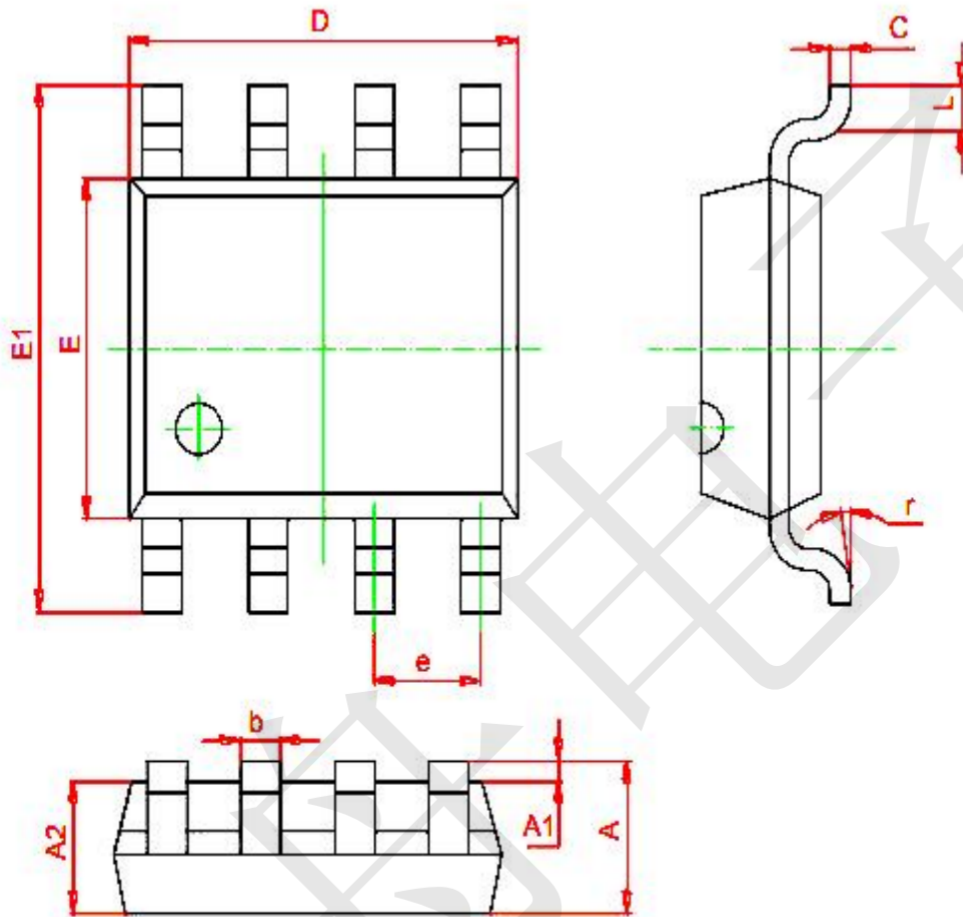


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



SOP-8 Package Outline Dimesions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
C	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°