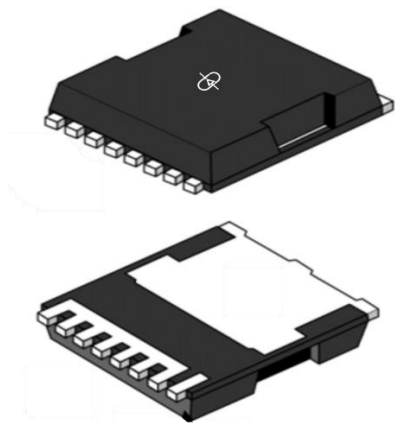


150V N-CHANNEL MOSFET

DESCRIPTION:



ALPN1P2P8T is an 150V N-Channel MOSFET. It has enhancement mode power field effect transistors are using trench MOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

FEATURES:

- $BV_{DS} = 150V$, $I_D = 203A$
- $R_{DS(ON)} \leq 2.8m\Omega$ @ $V_{GS} = 10V$
- Fast Switching
- Lead-free parts meet RoHS requirements

APPLICATIONS:

- DC/DC Converter
- High Power Inverter System
- Li-Battery Protection

MECHANICAL CHARACTERISTICS

- Case: Molded plastic, TOLLA-8 Pin
- Mounting Position: Any.

ORDERING PART NUMBER

PART NUMBER	ORDERING PART NUMBER
ALPN1P2P8T	ALPN1P2P8T-ER

MAXIMUM RATINGS

MAXIMUM RATINGS @ $T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise specified			
PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current $T_C = 25^{\circ}\text{C}$	I_D	203	A
Pulsed Drain Current ^(Note 1)	I_{DM}	800	A
Single pulse avalanche energy ($V_{DD}=50\text{V}$, $L=1.0\text{mH}$)	E_{AS}	1800	mJ
Power Dissipation $T_C = 25^{\circ}\text{C}$	P_D	300	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.5	$^{\circ}\text{C/W}$
Operating Junction Temperature Range	T_J	-55 to +175	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 to +175	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS @ $T_J = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP.	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\text{ }\mu\text{A}$	BV_{DSS}	150	-	-	V
Drain Source Leakage Current	$V_{DS}=120V, V_{GS}=0V$	I_{DSS}	-	-	1.0	μA
Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	± 100	nA
ON CHARACTERISTICS						
Gate-Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu\text{A}$	$V_{GS(th)}$	3.0	-	5.0	V
Static Drain-to-Source On-Resistance	$V_{GS}=10V, I_D=50A$	$R_{DS(ON)}$	-	-	2.8	$m\Omega$
	$V_{GS}=8V, I_D=30A$		-	-	3.5	

DYNAMIC CHARACTERISTICS (NOTE 3)						
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP.	MAX	UNIT
Input Capacitance	$V_{DS}=75V, V_{GS}=0V, F_{req}=1.0\text{ MHz}$	C_{iss}	-	9690	-	pF
Output Capacitance		C_{oss}	-	767	-	
Reverse Transfer Capacitance		C_{rss}	-	40	-	

SWITCHING CHARACTERISTICS (NOTE 3)						
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP.	MAX	UNIT
Total Gate Charge	$V_{DS}=75V, V_{GS}=10V, I_D=50A$	Q_g	-	142	-	nC
Gate to Source Charge		Q_{gs}	-	63	-	
Gate to Drain Charge		Q_{gd}	-	32	-	

DIODE CHARACTERISTICS (NOTE 3)						
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP.	MAX	UNIT
Turn-On Delay Time	$V_{DS}=75V, V_{GEN}=10V, R_G=3.9\Omega, R_L=1.5\Omega, I_D=50A$	$T_{d(on)}$	-	34	-	nS
Rise Time		T_r	-	111	-	
Turn-Off Delay Time		$T_{d(off)}$	-	70	-	
Fall Time		T_f	-	59	-	

DRAIN-SOURCE DIODE CHARACTERISTICS AND RATINGS						
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP.	MAX	UNIT
Continuous Source Current	$V_G=V_D=0V$, Force Current	I_S	-	-	203	A
Diode Forward Voltage (NOTE 2)	$V_{GS}=0V, I_S=50A$	V_{SD}	-	-	1.3	V

NOTES:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
3. Guaranteed by design, not subject to production testing.

TYPICAL DEVICE RATING AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$ unless otherwise noted)

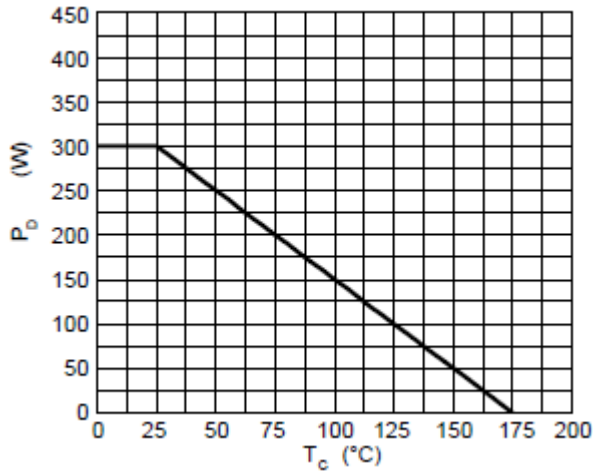


Fig.1 P_D Vs. T_c

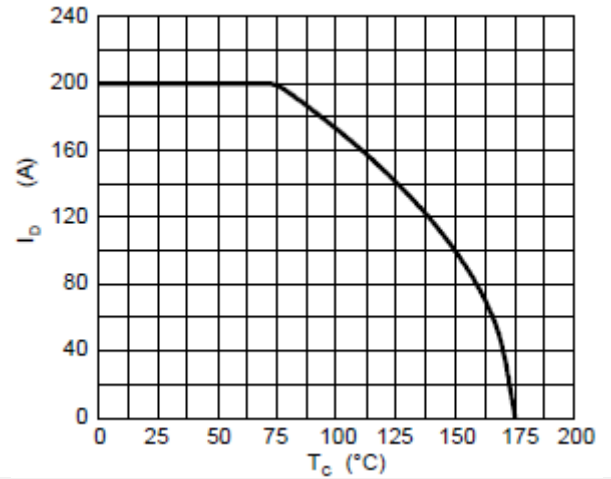


Fig.2 I_D Vs. T_c

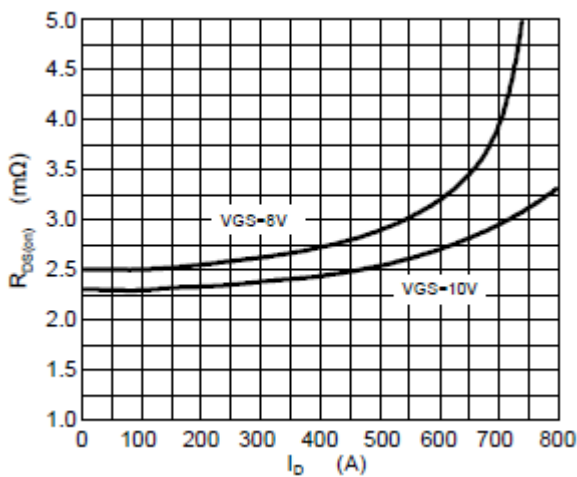


Fig.3 $R_{DS(on)}$ Vs. I_D

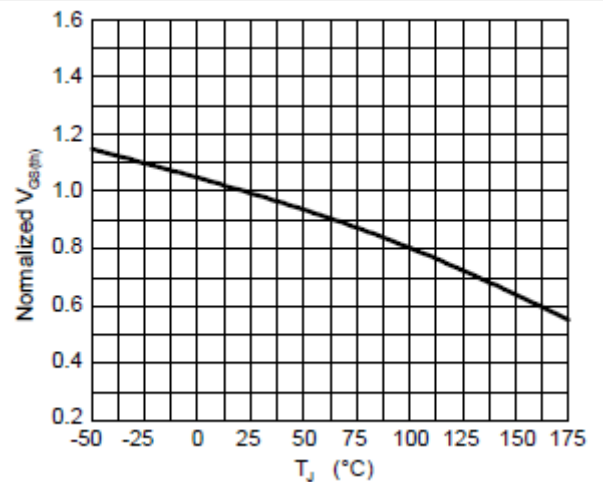


Fig.4 NORMALIZED $V_{GS(th)}$ Vs. T_J

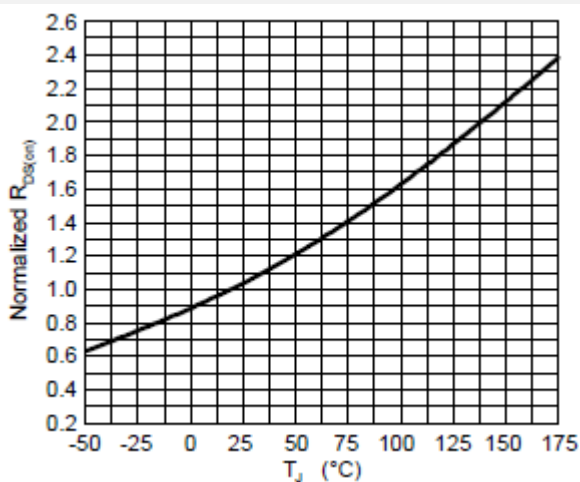


Fig.5 NORMALIZED $R_{DS(on)}$ Vs. T_J

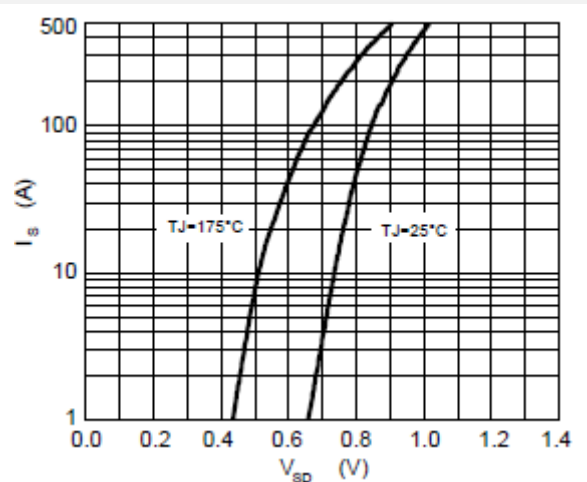


Fig.6 I_S Vs. V_{SD}

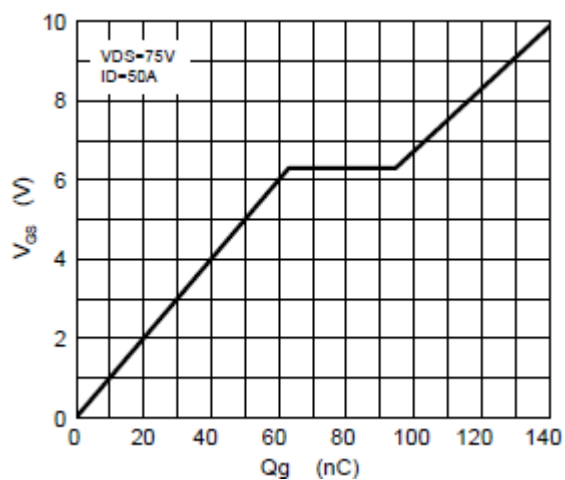


Fig.7 GATE CHARGE CHARACTERISTICS

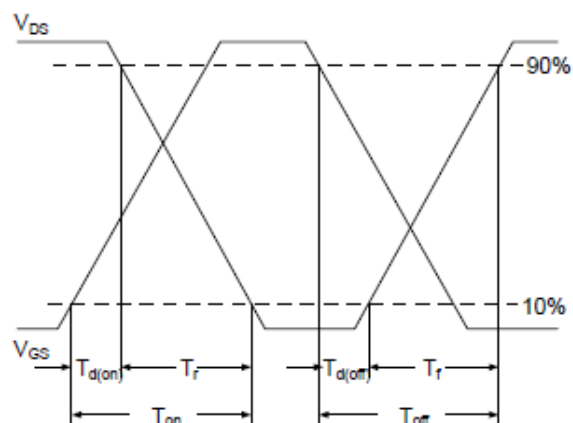
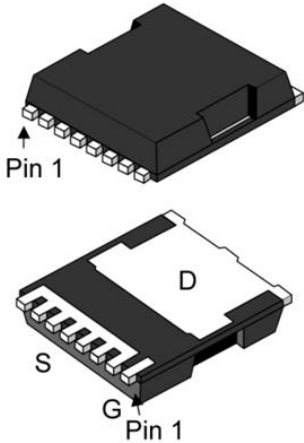
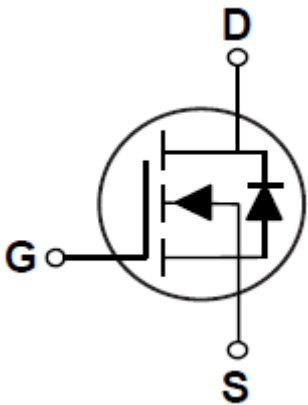


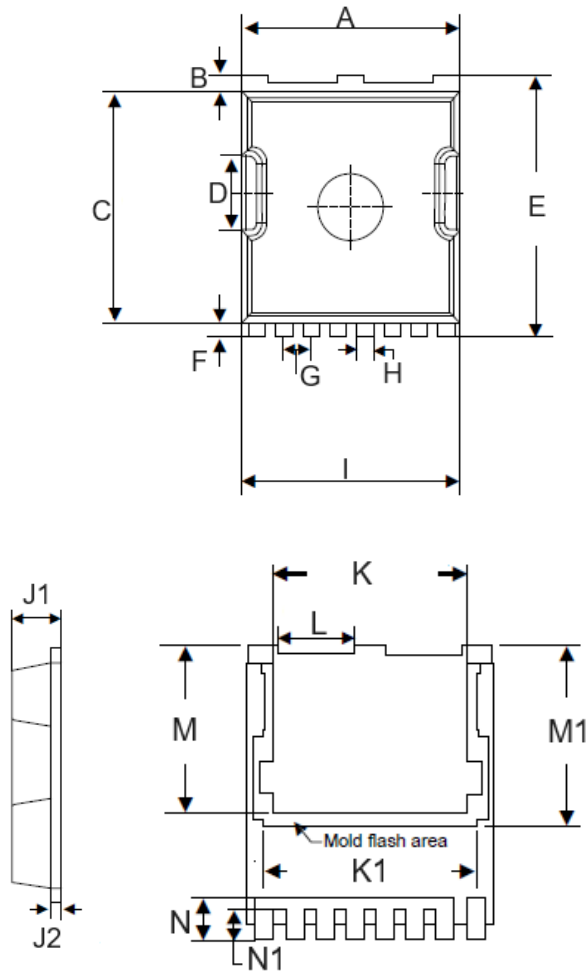
Fig.8 SWITCHING TIME WAVEFORM

PINNING INFORMATION

PIN - SIMPLIFIED OUTLINE	CIRCUIT DIAGRAM
 The diagram shows two views of the ALPN1P2P8T package. The top view shows the package with Pin 1 indicated. The bottom view shows the package with Pin 1, D, S, and G pins indicated.	 The circuit diagram shows a MOSFET with a diode. The MOSFET has a gate (G) and a source (S). The diode has an anode (A) and a cathode (C). The MOSFET is connected to the diode's anode, and the diode's cathode is connected to the MOSFET's source.

PACKAGE INFORMATION

TOLLA-8

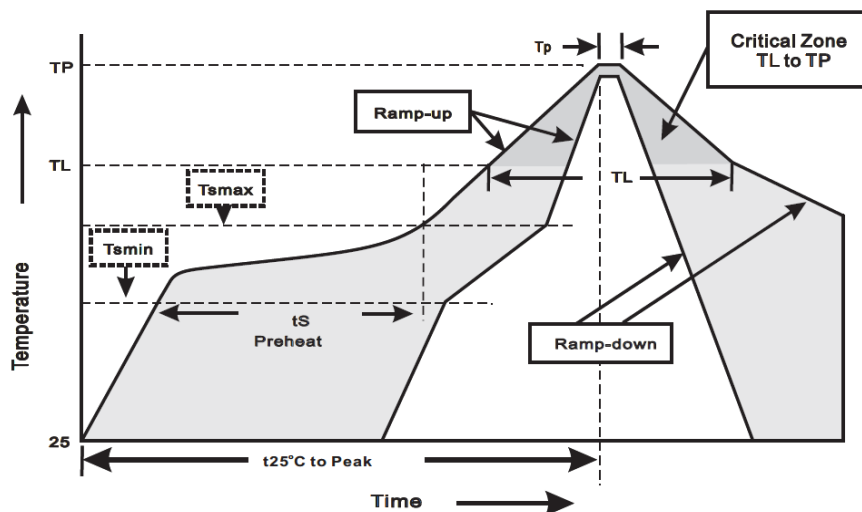


OUTLINE DIMENSIONS				
SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.65	9.95	0.379	0.392
B	0.50	0.90	0.019	0.036
C	10.18	10.60	0.400	0.418
D	2.85	3.50	0.112	0.138
E	11.45	11.90	0.451	0.469
F	0.45	0.75	0.017	0.030
G	1.20 BSC		0.048 BSC	
H	0.60	0.90	0.023	0.036
I	9.70	10.10	0.381	0.398
J1	2.15	2.45	0.084	0.097
J2	0.508 REF		0.020 REF	
K	7.50 REF		0.296 REF	
K1	8.50 REF		0.335 REF	
L	3.10 REF		0.123 REF	
M	6.65 REF		0.262 REF	
M1	7.15 REF		0.282 REF	
N	1.40	2.10	0.055	0.083
N1	1.20 REF		0.048 REF	

SOLDERING PARAMETERS

SUGGESTED THERMAL PROFILES FOR SOLDERING PROCESSES

1. Storage environment: Temperature=5 °C~40 °C Humidity=55% ±25%
2. Reflow soldering of surface-mount devices



3. Reflow soldering

PROFILE FEATURE	SOLDERING CONDITION
Average ramp-up rate (T_L to T_P)	<3 °C/sec
Preheat	
- Temperature Min (T_{smin})	150 °C
- Temperature Max (T_{smax})	200 °C
- Time (min to max) (t_s)	60 ~ 120 sec
T_{smax} to T_L	
- Ramp-upRate	<3 °C/sec
Time maintained above:	
- Temperature (T_L)	217 °C
- Time(t_L)	60 ~ 260 sec
Peak Temperature (T_P)	255 °C-0/+5 °C
Time within 5 °C of actual Peak Temperature(t_P)	10 ~ 30 sec
Ramp-down Rate	<6 °C/sec
Time 25 °C to Peak Temperature	<6 minutes



beyond boundaries...

ALPN1P2P8T

TOLLA-8

CUSTOMER NOTE:

DISCLAIMER

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2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).



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