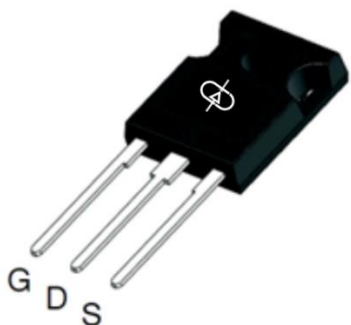


50A, 600V N-CHANNEL SUPER JUNCTION MOSFET

DESCRIPTION:



The ALPP60R055 is an 50A, 600V N-Channel Super Junction MOSFET and it a new technology for high voltage device in small package with low on resistance and conduction losses.

FEATURES:

- $R_{DS(ON)}$ TYP = $55m\Omega$ @ $V_{GS} = 10V < 65$ mohm,
 $I_D = 50A$, $V_{BR(DSS)} = 600V$
- New technology for high voltage device.
- Enhanced Avalanche Ruggedness
- Small package
- Low on-resistance and low conduction losses
- Ultra Low Gate Charge cause lower driving requirements
- RoHS compliant & halogen-free.
- Suffix "-H" indicated Halogen Free part, ex. ALPP60R055-H

APPLICATIONS:

- Switch Mode Power Supply (SMPS).
- Uninterruptible Power Supply (UPS).
- Power Factor Correction (PFC).

MECHANICAL CHARACTERISTICS

- Epoxy: UL94-V0 rated flame retardant.
- Case: Molded plastic, TO-247-3
- Terminals: Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position: Any.

MAXIMUM RATINGS

MAXIMUM RATINGS @ $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified			
PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage ($V_{GS} = 0V$)	V_{DS}	600	V
Gate-Source Voltage	V_{GSS}	± 30	V
Continuous Drain Current (DC)	I_D	50	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	150	A
Power Dissipation ($T_C = 25^{\circ}\text{C}$)	P_D	239	W
Single pulse avalanche energy ⁽¹⁾	E_{AS}	281	mJ
Peak Diode Recovery ⁽²⁾	dv/dt	20	V/nS
MOSFET		100	
Operating Junction Temperature Range	T_J	-55 to +150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^{\circ}\text{C}$
Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature. 2. $I_{SD} \leq 21.5A$, $di/dt \leq 100A/\mu s$, $V_{DD} \leq 400$, Starting $T_j = 25\text{ }^{\circ}\text{C}$.			

ELECTRICAL CHARACTERISTICS @ TA = 25 °C unless otherwise specified

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP.	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250 \mu A$	$V_{(BR)DSS}$	600			V
Zero Gate Voltage Drain Current	$V_{GS} = 0V, V_{DS} = 600V, T_j = 25^\circ C$	I_{DSS}			1	μA
Gate-source leakage current	$V_{GS} = \pm 30V$	I_{GSS}			± 100	nA
ON CHARACTERISTICS						
Gate-Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250 \mu A$	$V_{GS(TH)}$	2.5		4.5	V
Drain-to-Source On-Resistance ⁽³⁾	$V_{GS} = 10V, I_D = 25A$	$R_{DS(ON)}$		55	65	Ω

SWITCHING PARAMETERS						
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP.	MAX	UNIT
Input Capacitance	$V_{GS} = 0V, V_{DS} = 400V, f = 1MHz$	C_{iss}		3208		pF
Output Capacitance		C_{oss}		81		
Reverse Transfer Capacitance		C_{rss}		10		
Total Gate Charge	$V_{DS} = 400V, I_D = 25A, V_{GS} = 10V$	Q_g		75		nC
Gate to Source Charge		Q_{gs}		17.2		
Gate to Drain Charge		Q_{gd}		34.5		
Turn-On Delay Time	$V_{DD} = 400V, V_{GS} = 10V, I_D = 25A, R_{GEN} = 10\Omega$	$t_{d(on)}$		17		nS
Rise time		t_r		8		
Turn-Off Delay Time		$t_{d(off)}$		71		
Fall time		t_f		9		

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP.	MAX	UNIT
Body Diode Voltage	$V_{GS} = 0V, I_S = 25A, T_j = 25^\circ C$	V_{SD}			1.2	V

Note:

3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

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

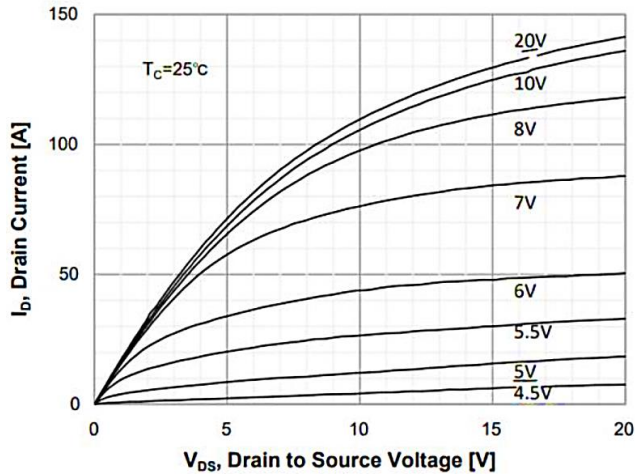


Fig.1 OUTPUT CHARACTERISTICS

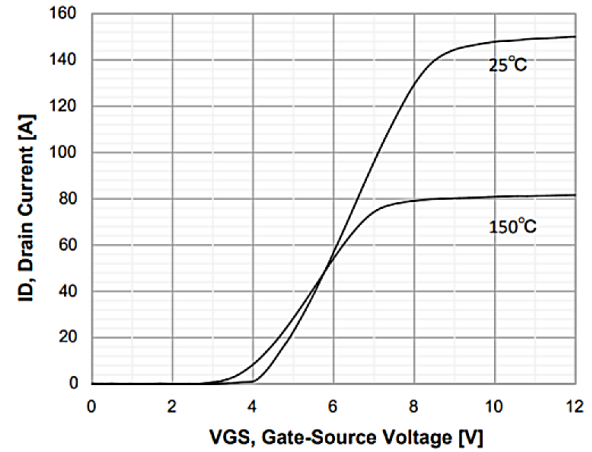


Fig.2 TRANSFER CHARACTERISTICS

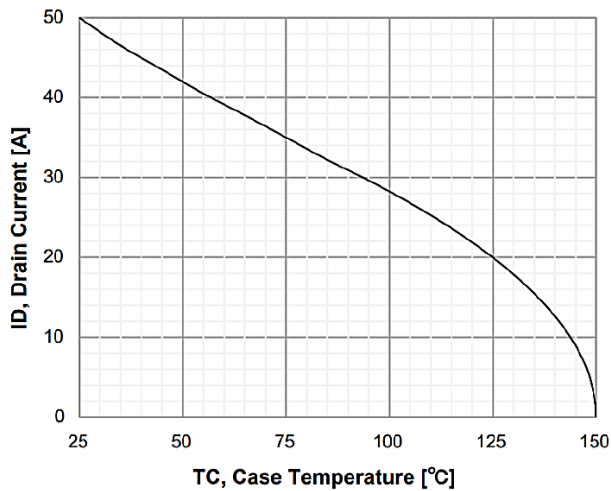


Fig.3 DRAIN CURRENT VS. TEMPERATURE

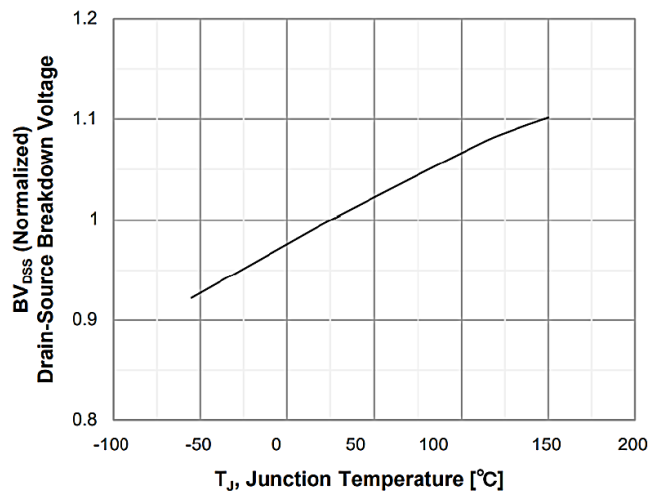


Fig.4 BV_{DSS} VARIATION VS. TEMPERATURE

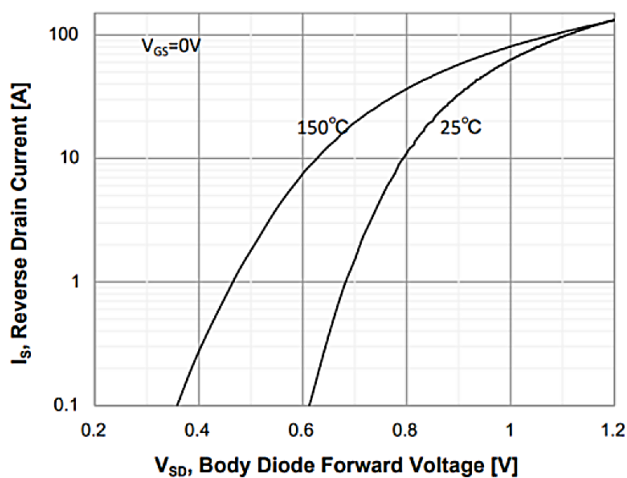


Fig.5 TRANSFER CHARACTERISTICS

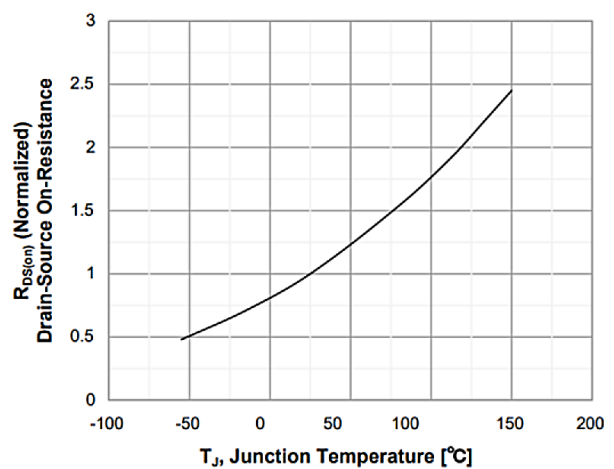
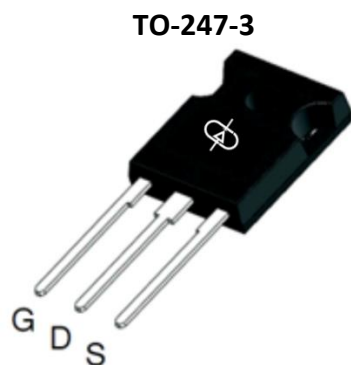


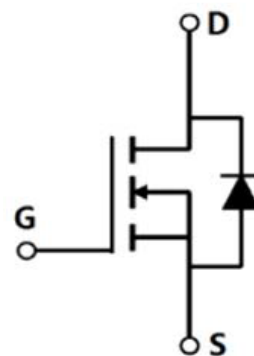
Fig.6 ON-RESISTANCE VS. TEMPERATURE

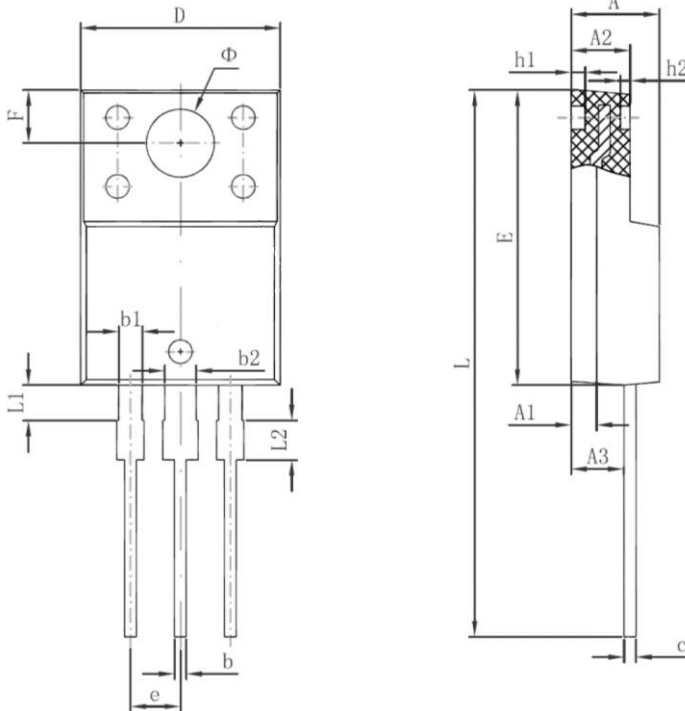
PINNING INFORMATION

SIMPLIFIED OUTLINE



SCHEMATIC DIAGRAM



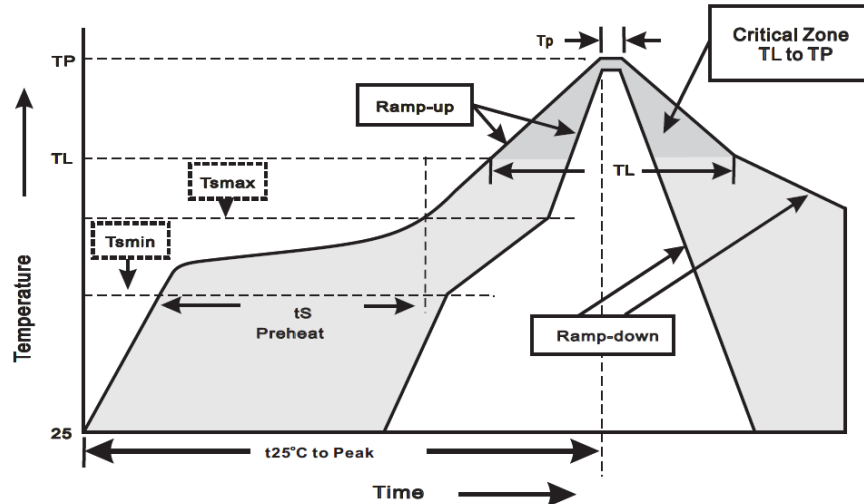
PACKAGE INFORMATION
TO-247-3


OUTLINE DIMENSIONS				
SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.70	0.169	0.185
A1	1.30 REF.		0.051 REF.	
A2	2.80	3.20	0.110	0.126
A3	2.50	2.90	0.098	0.114
b	0.50	0.75	0.020	0.030
b1	1.10	1.35	0.043	0.053
b2	1.50	1.75	0.059	0.069
c	0.50	0.75	0.020	0.030
D	9.96	10.36	0.392	0.408
E	14.80	15.20	0.583	0.598
e	2.54 TYP.		0.100 TYP.	
F	2.70 REF.		0.106 REF.	
Φ	3.50 REF.		0.138 REF.	
h	0.00	0.30	0.000	0.012
h1	0.80 REF.		0.031 REF.	
h2	0.50 REF.		0.020 REF.	
L	28.00	28.40	1.102	1.118
L1	1.70	1.90	0.067	0.075
L2	1.90	2.10	0.075	0.083

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	<3 °C/sec
Time 25 °C to Peak Temperature	<6 minutes



beyond boundaries...

ALPP60R055

TO-247-3

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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