

Product Summary

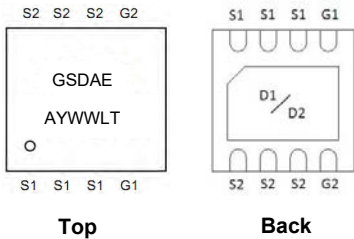
V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
20	5.2 @ $V_{GS} = 4.5V$	15.4

Features

- Low $R_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested

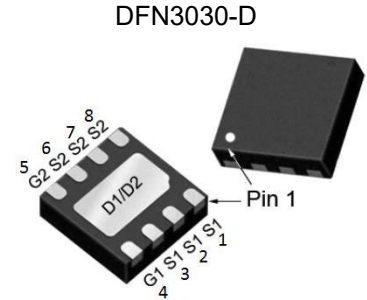
Application

- DC/DC conversion
- Power switch
- Motor drives
- Li- Battery Protection

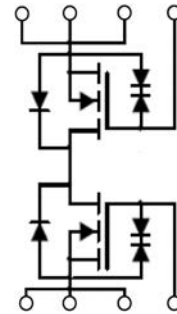


DFN3030-D

NOTE:
 LOGO - GS
 DAE- Part number code
 A - Assembly location code
 Y - Year code
 WW - Week code
 L&T - Assembly lot code



Equivalent circuit



Absolute maximum rating@25°C

Parameter		Symbol	Limit	Unit
Drain-source voltage		V _{DS}	20	V
Gate-source voltage		V _{GS}	±10	
Continuous drain current	T _C =25°C	I _D ⁽¹⁾	56	A
	T _C =100°C		37	
	T _A =25°C		15.4	
	T _A =70°C		13.2	
Pulsed drain current		I _{D,pulse} ⁽¹⁾⁽²⁾	100	
Power dissipation	T _C =25°C	P _D ⁽³⁾	3.1	W
Operating junction and storage temperature range		T _J , T _{stg}	-55 to 150	°C

Thermal Characteristic

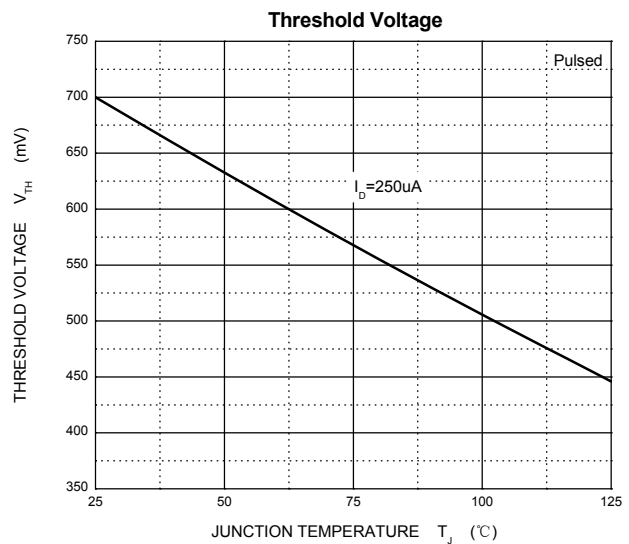
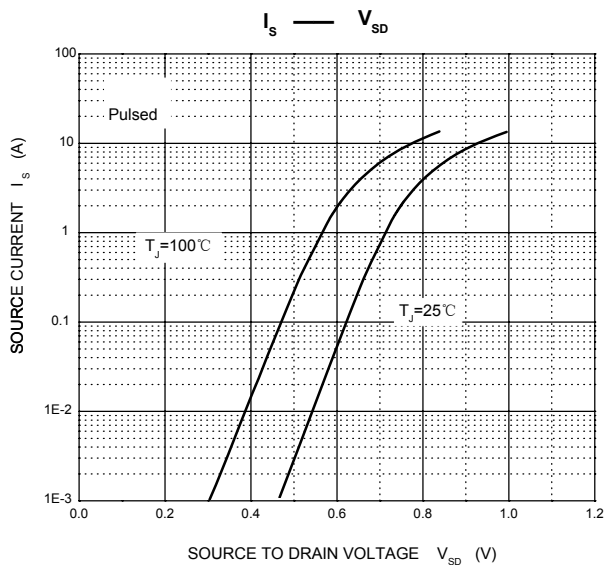
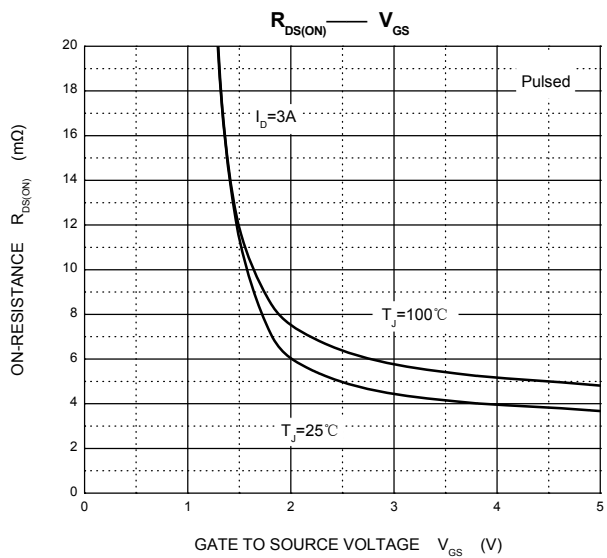
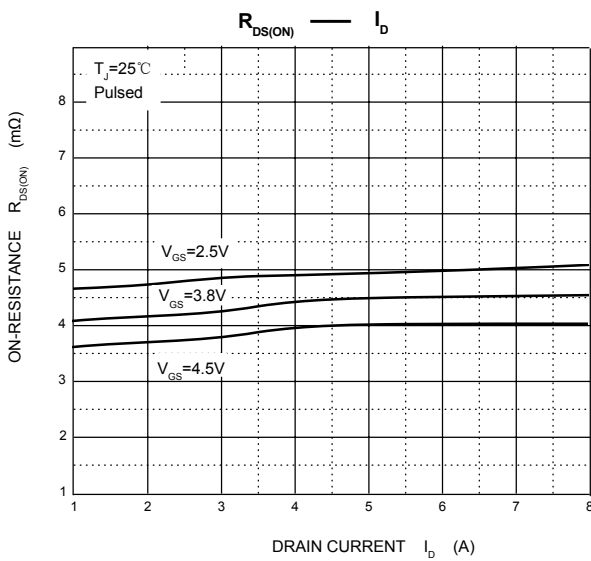
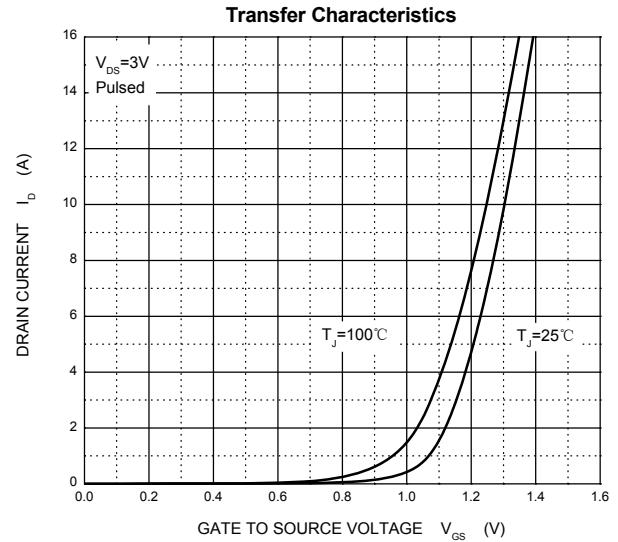
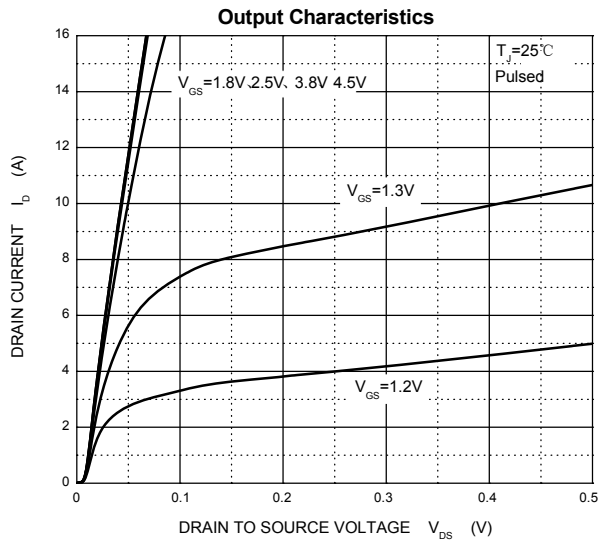
Parameter	Symbol	Max.	Unit
Thermal resistance, junction-to-case	$R_{\theta JC}$	2.2	°C/W
Thermal resistance, junction-to-ambient ^(A D)	$R_{\theta JA}$	40	

Electrical Characteristics (@TJ = +25°C unless otherwise specified.)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	20			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 18V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 4.5V, V_{DS} = 0V$			± 1	μA
		$V_{GS} = \pm 8V, V_{DS} = 0V$			± 10	μA
Gate threshold voltage	$V_{GS(th)}^{(4)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.5	0.7	0.9	V
Drain-source on-resistance	$R_{DS(on)}^{(4)}$	$V_{GS} = 4.5V, I_D = 3A$		3.7	5.2	m Ω
		$V_{GS} = 4.0V, I_D = 3A$		3.8	5.5	m Ω
		$V_{GS} = 3.8V, I_D = 3A$		3.9	5.7	m Ω
		$V_{GS} = 3.1V, I_D = 3A$		4.2	6.0	m Ω
		$V_{GS} = 2.5V, I_D = 3A$		4.6	6.2	m Ω
Forward tranconductance	$g_{FS}^{(4)}$	$V_{DS} = 5V, I_D = 3A$	9	44		S
Diode forward voltage	$V_{SD}^{(4)}$	$I_S = 1A, V_{GS} = 0V$			1	V
DYNAMIC PARAMETERS ⁽⁵⁾						
Input Capacitance	C_{iss}	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$		1890		pF
Output Capacitance	C_{oss}			322		pF
Reverse Transfer Capacitance	C_{rss}			280		pF
Total gate charge	Q_g	$V_{DS} = 10V, V_{GS} = 4.5V, I_D = 3A$		27.4		nC
Gate-source charge	Q_{gs}			2.6		nC
Gate-drain charge	Q_{gd}			7.9		nC
SWITCHING PARAMETERS ⁽⁵⁾						
Turn-on delay time	$t_{d(on)}$	$V_{GS} = 5V, V_{DD} = 10V, I_D = 3A$ $R_L = 1.35\Omega, R_{GEN} = 3\Omega$		4.8		ns
Turn-on rise time	t_r			9.3		ns
Turn-off delay time	$t_{d(off)}$			79		ns
Turn-off fall time	t_f			22		ns
Drain-Source Diode Characteristics						
Diode Forward Current	$I_S^{(6)}$		-	-	15.4	A

Notes :

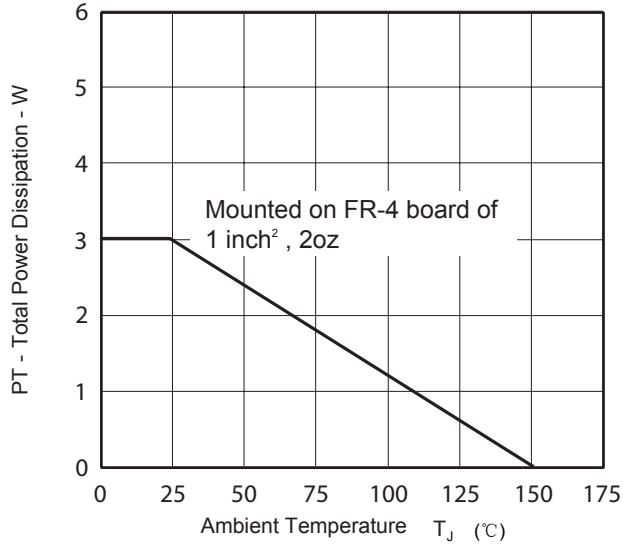
1. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
2. Pulse Test: Pulse Width < 10 μs , Duty Cycle < 0.5%.
3. The power dissipation is limited by 150°C junction temperature
4. Pulse Test : Pulse width $\leq 300\mu s$, duty cycle $\leq 0.5\%$.
5. Guaranteed by design, not subject to production testing.
6. The data is theoretically the same as I_D , in real applications , should be limited by total power dissipation.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS


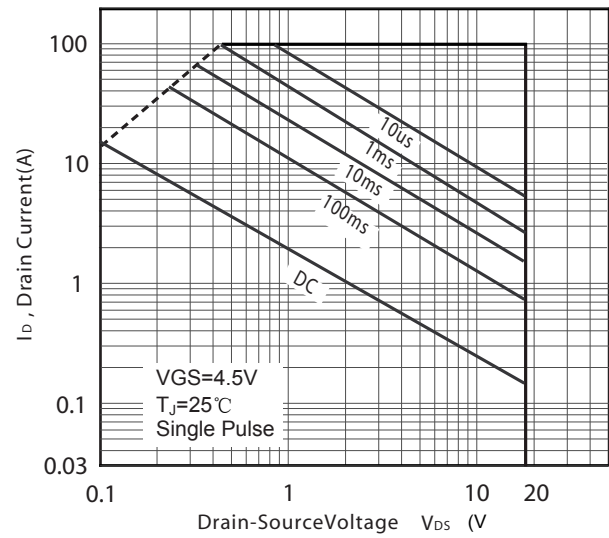


TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

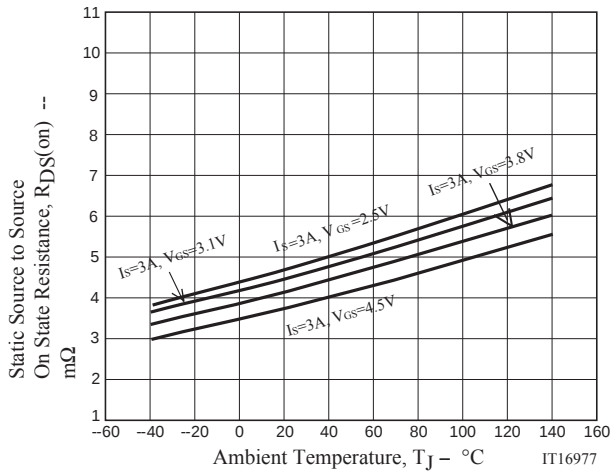
TOTAL POWER DISSIPATION vs.
AMBIENT TEMPERATURE



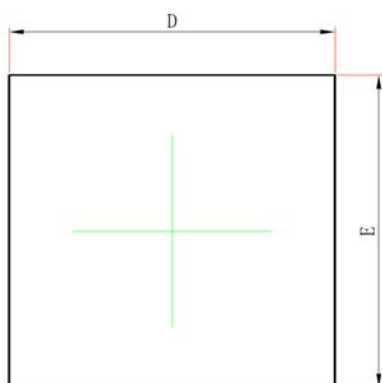
Maximum Safe Operating Area



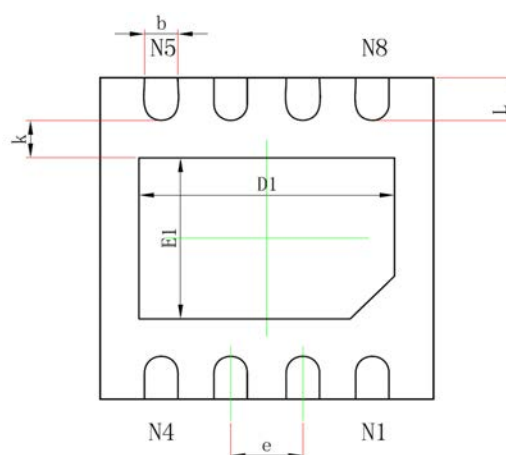
$R_{DS(ON)}$ — T_A



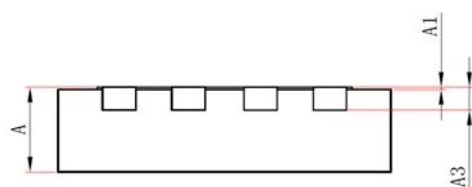
Package outline:DFN3030-D



TOP VIEW



BOTTOM VIEW



SIDE VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	2.924	3.076	0.115	0.121
E	2.924	3.076	0.115	0.121
D1	2.200	2.400	0.087	0.094
E1	1.400	1.600	0.055	0.063
b	0.250	0.350	0.010	0.014
k	0.200MIN		0.008MIN	
e	0.650TYP.		0.026TYP.	
L	0.324	0.476	0.013	0.019

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