

## FEATURES

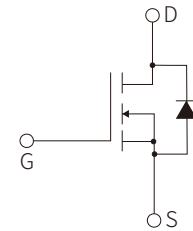
- | Surface-mounted package
- | Low Thermal Resistance



LFPAK5×6

## APPLICATION

- | Motor drivers
- | DC - DC Converter



Schematic Symbol

## APPROVALS

<b>RoHS</b>	Compliance with 2011/65/EU
<b>HF</b>	Compliance with IEC61249-2-21:2003

## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage $T_c=25^\circ\text{C}$	$V_{DS}$	40	V
Drain Current ( Pulsed ) $T_c=25^\circ\text{C}$ $V_{GS}=10\text{V}$	$I_{DM}^{***}$	1300	A
Drain Current ( DC )	$T_c=25^\circ\text{C}$ $V_{GS}=10\text{V}$	325	A
	$T_c=100^\circ\text{C}$ $V_{GS}=10\text{V}$	325	A
Gate-Source Voltage $T_c=25^\circ\text{C}$	$V_{GS}$	$\pm 20$	V
Total Power Dissipation $T_c=25^\circ\text{C}$	$P_{tot}^*$	375	W
Diode Forward Current $T_c=25^\circ\text{C}$	$I_S$	325	A
Junction Temperature	$T_J$	175	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 to 175	$^\circ\text{C}$
Single Pulsed Avalanche Energy $V_{DD} = 40\text{V}$ , $L=1\text{mH}$	$E_{AS}^*$	1152	mJ
Thermal Resistance – Junction to Ambient	$R_{\theta JA}^*$	42	$^\circ\text{C}/\text{W}$
Thermal Resistance- Junction to Case	$R_{\theta JC}^*$	0.4	$^\circ\text{C}/\text{W}$

**Notes:**

- \* Surface Mounted on 1 in<sup>2</sup> pad area,  $t \leq 10$  sec
- \*\* Pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 1\%$
- \*\*\* Limited by bonding wire

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>DS</sub> =250μA	40			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250μA	2		4	V
Drain Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =32V, V <sub>GS</sub> =0V			1	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V			±100	nA
On-State Resistance	R <sub>DS(on)</sub> <sup>a</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =50A		0.50	0.55	mΩ
		V <sub>GS</sub> =6V, I <sub>D</sub> =30A		1.42	1.65	mΩ
<b>Diode Characteristics</b>						
Diode Forward Voltage	V <sub>SD</sub> <sup>a</sup>	I <sub>SD</sub> =50A, V <sub>GS</sub> =0V			1.3	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>SD</sub> =45A dI <sub>SD</sub> /dt=100A/μs		76		nS
Reverse Recovery Charge	Q <sub>rr</sub>			54		nC
<b>Dynamic Characteristics<sup>b</sup></b>						
Input capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =20V, Frequency = 1 MHz		7204		pF
Output capacitance	C <sub>oss</sub>			2944		pF
Reverse transfer capacitance	C <sub>rss</sub>			147		pF
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DS</sub> =20V, V <sub>GEN</sub> =10V R <sub>G</sub> =3.9Ω, R <sub>L</sub> =0.4Ω, I <sub>DS</sub> =50A		26		nS
Turn-on Rise Time	t <sub>r</sub>			105		nS
Turn-Off Delay Time	t <sub>d(off)</sub>			81		nS
Turn-Off Fall Time	t <sub>f</sub>			72		nS
<b>Gate Charge Characteristics<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =10V, I <sub>DS</sub> =50A		121		nC
Gate-Source Charge	Q <sub>gs</sub>			40		nC
Gate-Drain Charge	Q <sub>gd</sub>			31		nC

**Notes:**

a : Pulse test ; pulse width ≤ 300μs, duty cycle ≤ 2 %

b : Guaranteed by design, not subject to production testing

# PARAMETER CHARACTERISTIC CURVE

Figure1: Power Capability

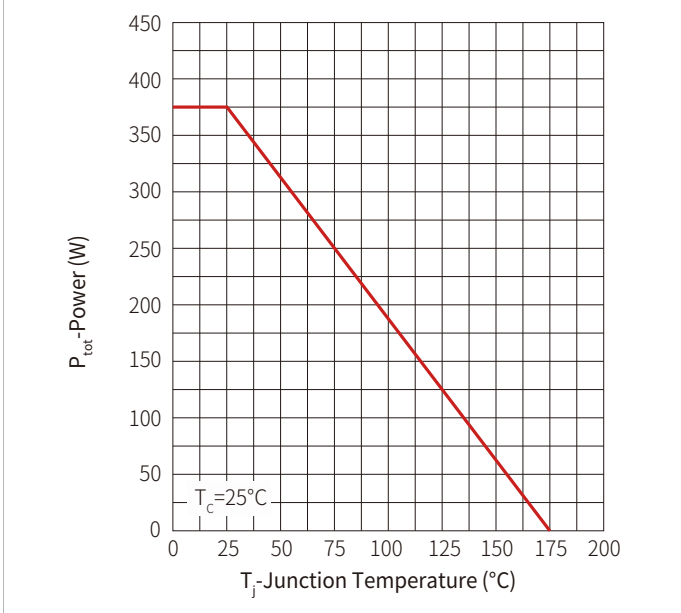


Figure2: Current Capability

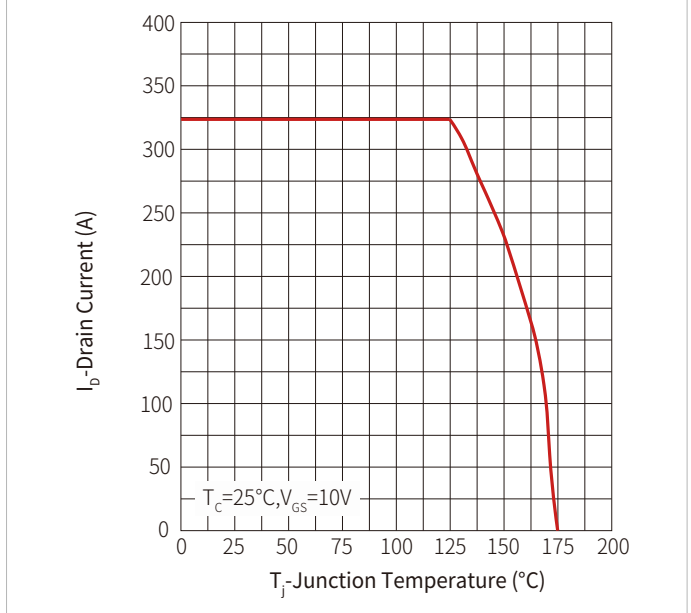


Figure3: Safe operating Area

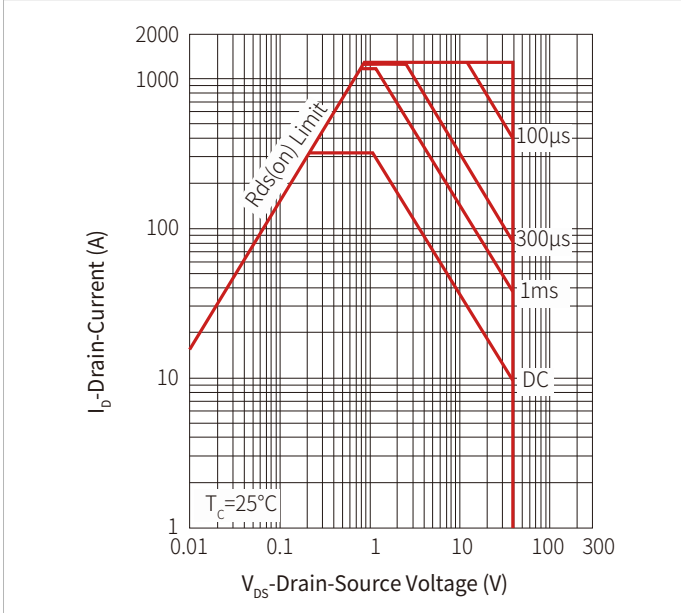
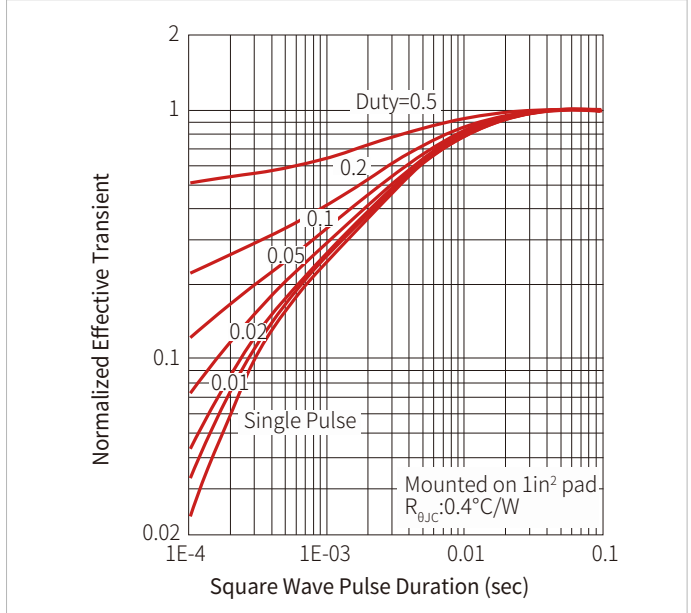
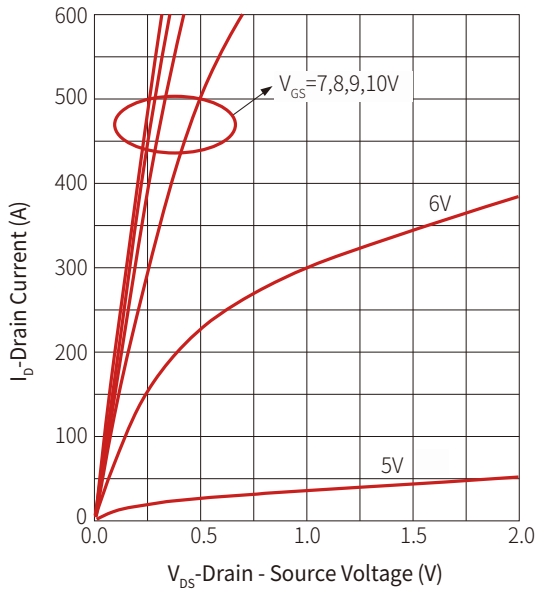


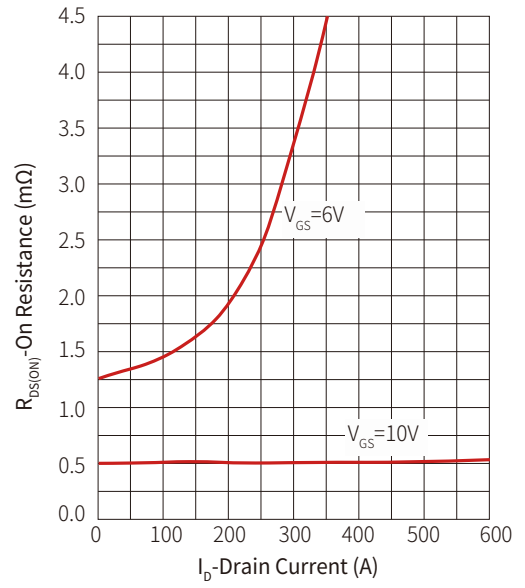
Figure 4: Transient Thermal Impedance



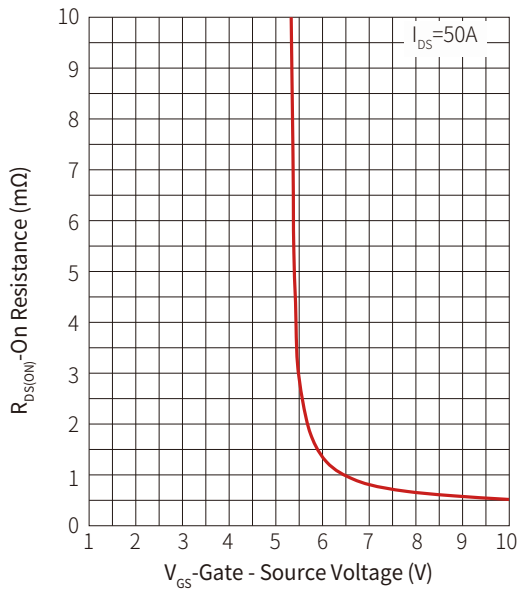
**Figure 5: Output Characteristics**



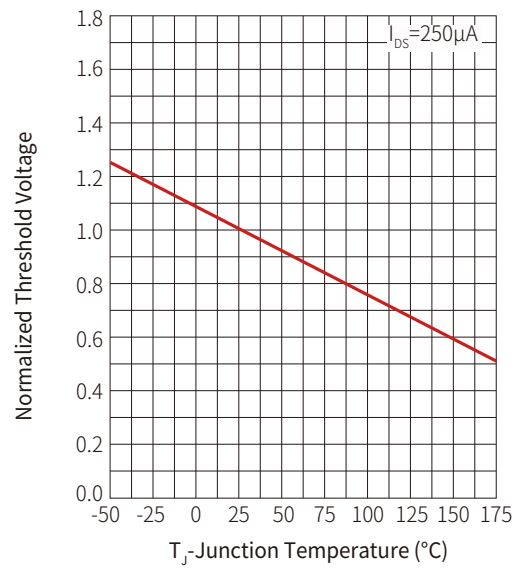
**Figure 6: On Resistance**



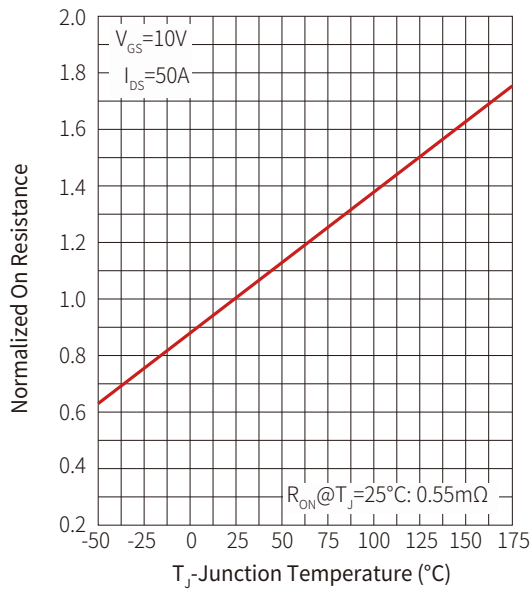
**Figure 7: Transfer Characteristics**



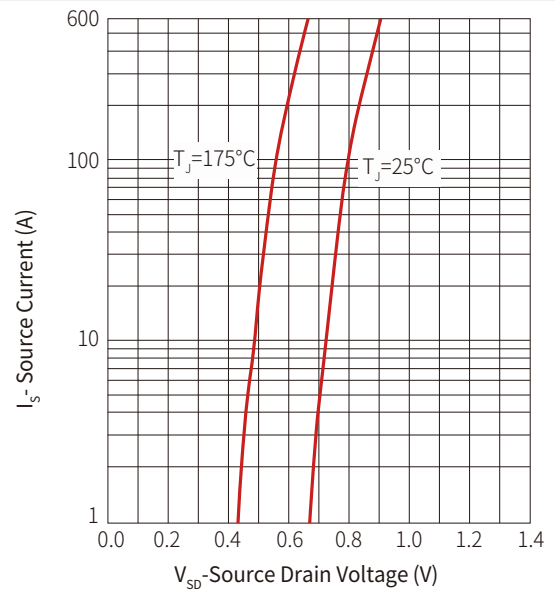
**Figure 8: Normalized Threshold Voltage**



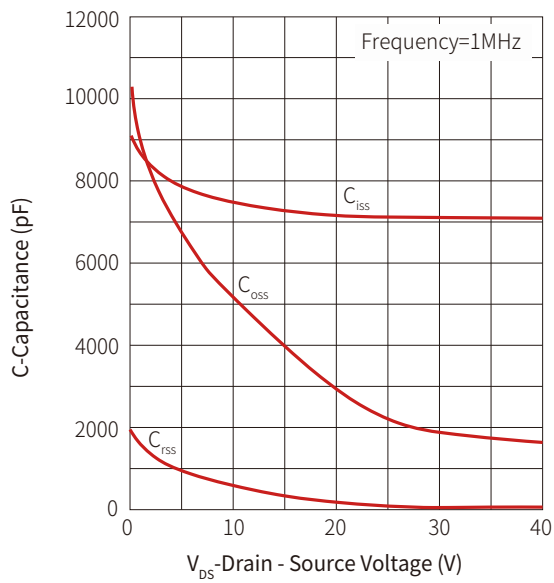
**Figure 9: Normalized On Resistance**



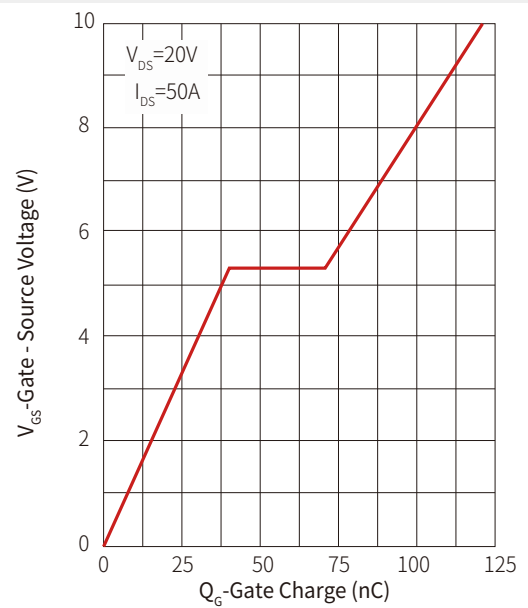
**Figure 10: Diode Forward Current**



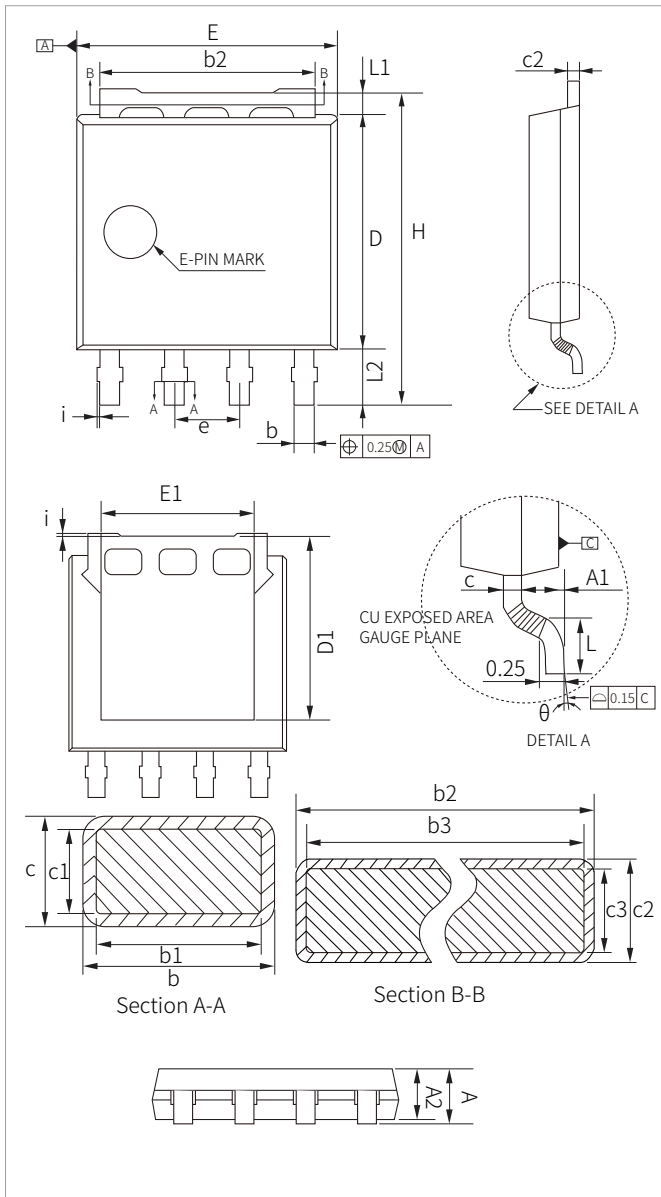
**Figure 11: Capacitance**



**Figure 12: Gate Charge**



## LFPAK5×6 PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.00	1.30	0.039	0.051
A1	0.00	0.15	0.00	0.006
A2	0.98	1.12	0.039	0.044
b	0.35	0.50	0.014	0.020
b1	0.32	0.46	0.013	0.018
b2	4.02	4.41	0.158	0.174
b3	4.00	4.37	0.157	0.172
c	0.19	0.25	0.007	0.010
c1	0.17	0.23	0.007	0.010
c2	0.24	0.30	0.010	0.012
c3	0.22	0.28	0.009	0.011
D	4.45	4.70	0.175	0.185
D1	-	4.45	-	0.175
E	4.95	5.30	0.195	0.209
E1	3.50	3.70	0.138	0.146
e	1.27BSC		0.050BSC	
H	5.95	6.25	0.234	0.246
i	-	0.25	-	0.010
L	0.40	0.85	0.016	0.033
L1	0.27	0.57	0.011	0.022
L2	0.80	1.30	0.031	0.051
$\theta$	0°	8°	0°	0.315°

## ORDERING INFORMATION

Part Number	Component Package	Marking	QTY/Reel	Reel Size
SNM005N04FH	LFPAK5×6	005N04H XXXX XXXXXX	5000PCS	13"

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