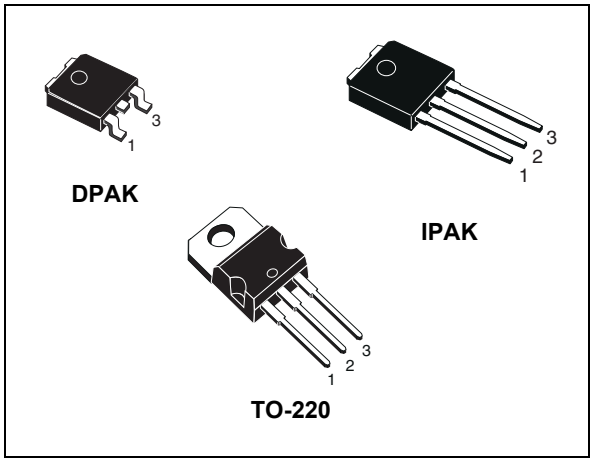
STD95N2LH5
STP95N2LH5, STU95N2LH5

N-channel 25 V, 0.0038 Ω, 80 A, DPAK, IPAK, TO-220
STripFET™ V Power MOSFET

Features

Type	V_{DSS}	$R_{DS(on)}$ max	I_D
STD95N2LH5	25 V	< 0.0045 Ω	80 A
STP95N2LH5	25 V	< 0.0049 Ω	80 A
STU95N2LH5	25 V	< 0.0049 Ω	80 A

- $R_{DS(on)}$ * Q_g industry benchmark
- Extremely low on-resistance $R_{DS(on)}$
- High avalanche ruggedness
- Low gate drive power losses



Application

- Switching applications

Description

This STripFET™V Power MOSFET technology is among the latest improvements, which have been especially tailored to achieve very low on-state resistance providing also one of the best-in-class FOM (figure of merit).

Figure 1. Internal schematic diagram

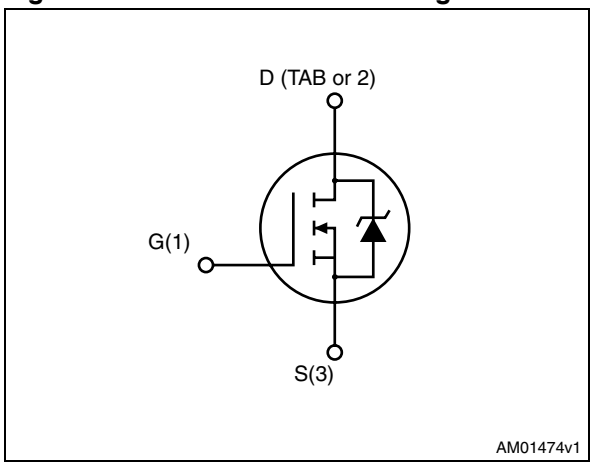


Table 1. Device summary

Order codes	Marking	Package	Packaging
STD95N2LH5	95N2LH5	DPAK	Tape and reel
STP95N2LH5	95N2LH5	TO-220	Tube
STU95N2LH5	95N2LH5	IPAK	Tube

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value		Unit
		DPAK/IPAK	TO-220	
V_{DS}	Drain-source voltage (V_{GS}=0)	25		V
V_{GS}	Gate-Source voltage	± 22		V
I_D (1)	Drain current (continuous) at T_C = 25°C	80	95	A
I_D	Drain current (continuous) at T_C = 100°C	67		A
I_{DM} (2)	Drain current (pulsed)	320	380	A
P_{TOT}	Total dissipation at T_C = 25°C	70	80	W
	Derating factor	0.47		W/°C
E_{AS} (3)	Single pulse avalanche energy	165		mJ
T_j T_{stg}	Operating junction temperature Storage temperature	-55 to 175		°C

1. Limited by wire bonding
2. Pulse width limited by safe operating area
3. Starting Tj = 25°C, Id = 40 A, Vdd = 20 V

Table 3. Thermal resistance

Symbol	Parameter	Value	Unit
$R_{thj-case}$	Thermal resistance junction-case max	2.14	°C/W
$R_{thj-amb}$	Thermal resistance junction-case max	100	°C/W
T_j	Maximum lead temperature for soldering purpose	275	°C

2 Electrical characteristics

(T_{CASE}=25 °C unless otherwise specified)

Table 4. Static

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source breakdown Voltage	I_D = 250 µA, V_{GS}= 0	25			V
I_{DSS}	Zero gate voltage drain current (V_{GS} = 0)	V_{DS} = 25 V V_{DS} = 25 V,Tc = 125°C			1 10	µA µA
I_{GSS}	Gate body leakage current (V_{DS} = 0)	V_{GS} = ± 22 V			±100	nA
$V_{GS(th)}$	Gate threshold voltage	V_{DS}= V_{GS}, I_D = 250 µA	1			V
$R_{DS(on)}$	Static drain-source on resistance	V_{GS}= 10 V, I_D= 40 A SMD version		0.0038	0.0045	Ω
		V_{GS}= 10 V, I_D= 40 A		0.0044	0.0049	Ω
		V_{GS}= 5 V, I_D= 40 A SMD version		0.005	0.006	Ω
		V_{GS}= 5 V, I_D= 40 A		0.006	0.007	Ω

Table 5. Dynamic

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
C_{iss} C_{oss} C_{rss}	Input capacitance Output capacitance Reverse transfer capacitance	V_{DS} =25 V, f=1 MHz, V_{GS}=0	-	1817 420 67	-	pF pF pF
Q_g Q_{gs} Q_{gd}	Total gate charge Gate-source charge Gate-drain charge	V_{DD}=13 V, I_D = 80 A V_{GS} =5 V	-	13.4 6.7 4.1	-	nC nC nC
Q_{gs1} Q_{gs2}	Pre V_{th} gate-to-source charge Post V_{th} gate-to-source charge	V_{DD}=13 V, I_D = 80 A	-	3.5 3.2	-	nC nC
R_G	Gate input resistance	f=1 MHz gate bias Bias= 0 test signal level=20 mV open drain	-	1.1	-	Ω

Table 6. Switching on/off (inductive load)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$ t_r	Turn-on delay time Rise time	V_{DD}=12.5 V, I_D= 40 A, R_G= 4.7 Ω, V_{GS}= 10 V	-	7 38	-	ns ns
$t_{d(off)}$ t_f	Turn-off delay time Fall time	V_{DD}=12.5 V, I_D= 40 A, R_G= 4.7 Ω, V_{GS}= 10 V	-	22 7	-	ns ns

Table 7. Source drain diode

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{SD} I_{SDM}(1)	Source-drain current Source-drain current (pulsed)		-		80 320	A A
V_{SD}(2)	Forward on voltage	I_{SD}= 35 A, V_{GS}=0	-		1.1	V
t_{rr} Q_{rr} I_{RRM}	Reverse recovery time Reverse recovery charge Reverse recovery current	I_{SD} = 80 A, V_{DD}= 20 V di/dt =100 A/µs,	-	32.4 27.1 1.7		ns nC A

1. Pulse width limited by safe operating area
2. Pulsed: pulse duration = 300 µs, duty cycle 1.5%

2.1 Electrical characteristics (curves)

Figure 2. Safe operating area for DPAK, IPAK

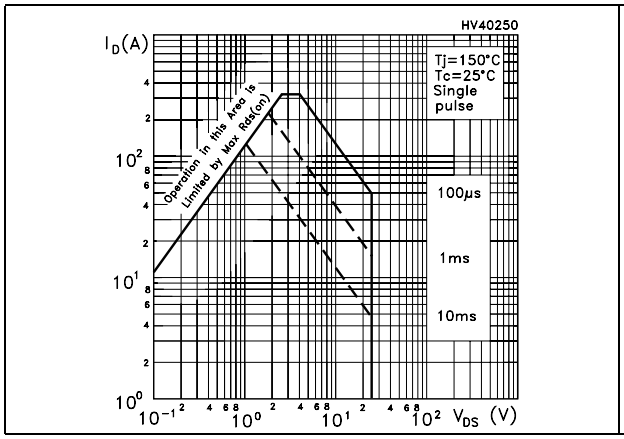


Figure 3. Thermal impedance for DPAK, IPAK

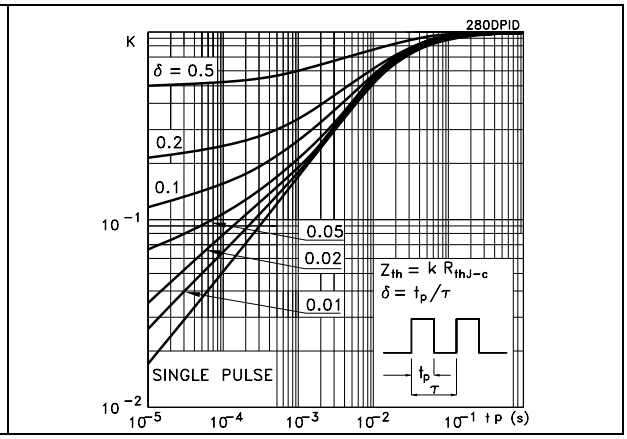


Figure 4. Safe operating area for TO-220

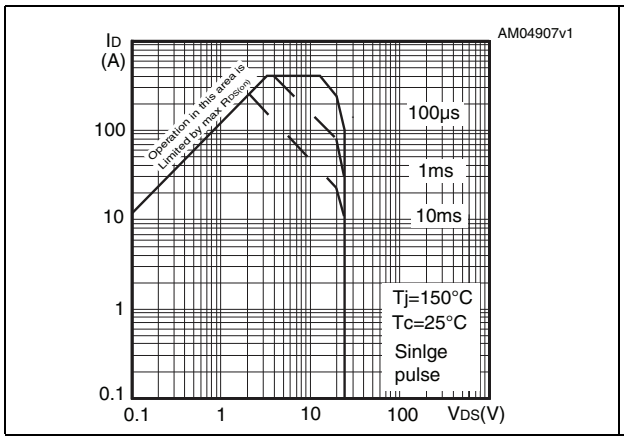


Figure 5. Thermal impedance for TO-220

Figure 6. Output characteristics

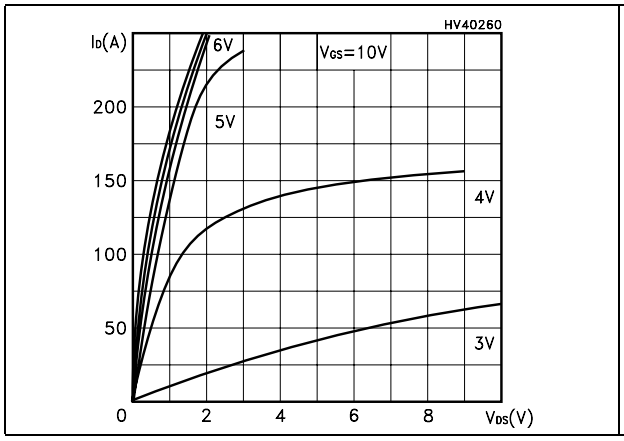


Figure 7. Transfer characteristics