



STN456DN
N Channel Enhancement Mode MOSFET



70A

DESCRIPTION

STN456DN uses Trench MOSFET technology that is uniquely optimized to provide the most efficient high frequency switching performance. It has been optimized for low gate charge, low $R_{DS(ON)}$ and fast switching speed.

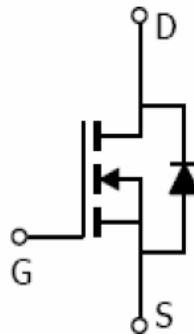
PIN CONFIGURATION POWER PACK 5x6 (1212-8L)



Y : Year Code
A : Date Code
B : Package Code
C : Process Code

FEATURE

- 30V/30A, $R_{DS(ON)} = 4.0m\Omega$ (Typ.)
@ $V_{GS} = 10V$
- 30V/15A, $R_{DS(ON)} = 5.8m\Omega$
@ $V_{GS} = 4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- PPAK5x6 (1212-8L) package design





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ABSOLUTE MAXIMUM RATINGS (Ta = 25°C Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		VDSS	30	V
Gate-Source Voltage		VGSS	±20	V
Continuous Drain Current (TJ=150°C)	TA=25°C TA=70°C	ID	35 21	A
Pulsed Drain Current		IDM	70	A
Continuous Source Current (Diode Conduction)		IS	90	A
Power Dissipation	TA=25°C	PD	74	W
Operation Junction Temperature		TJ	150	°C
Storage Temperature Range		TSTG	-55/150	°C
Thermal Resistance-Junction to Ambient		RθJA	62	°C/W



ELECTRICAL CHARACTERISTICS (Ta = 25°C Unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2		2.5	V
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24V, V_{GS}=0V$			1	μA
		$V_{DS}=24V, V_{GS}=0V$ $T_J=55^{\circ}C$			5	
Drain-source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=30A$ $V_{GS}=4.5V, I_D=15A$		5.5 7.5	6.5 9.0	m Ω
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=30A$		43		S
Diode Forward Voltage	V_{SD}	$I_S=1.0A, V_{GS}=0V$			1.0	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=15V, V_{GS}=4.5V$ $I_D=15A$		20		nC
Gate-Source Charge	Q_{gs}			7.6		
Gate-Drain Charge	Q_{gd}			7.2		
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V$ $F=1MHz$		2295		pF
Output Capacitance	C_{oss}			267		
Reverse Transfer Capacitance	C_{rss}			210		
Turn-On Time	$t_{d(on)}$ t_r	$V_{DD}=15V, I_D=15A$ $V_{GS}=10V, R_G=3.3\Omega$		7.8		nS
Turn-Off Time	$t_{d(off)}$ t_f			15		
				37.3		
				1.6		

TYPICAL CHARACTERISTICS ($T_j=25^\circ\text{C}$ unless otherwise noted)

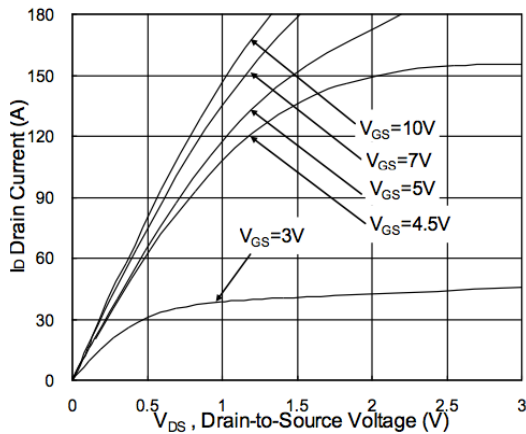


Fig.1 Typical Output Characteristics

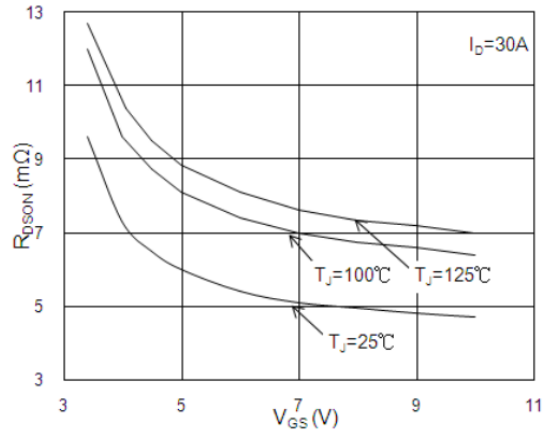


Fig.2 On-Resistance vs. G-S Voltage

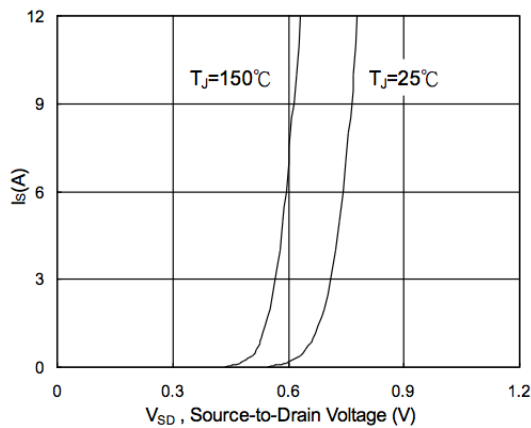


Fig.3 Forward Characteristics of Reverse

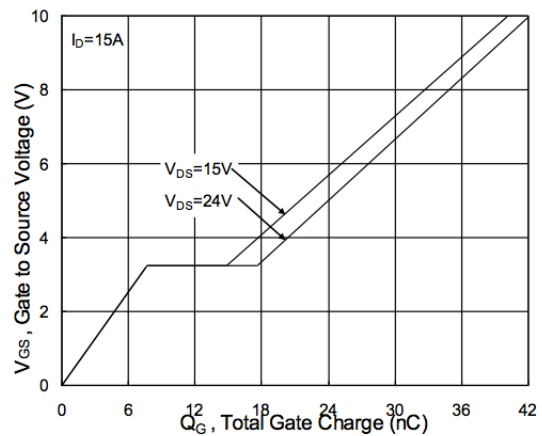


Fig.4 Gate-Charge Characteristics

TYPICAL CHARACTERISTICS (T_j=25°C unless otherwise noted)

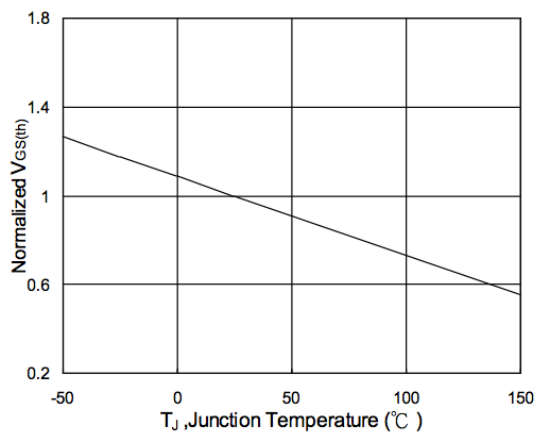


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

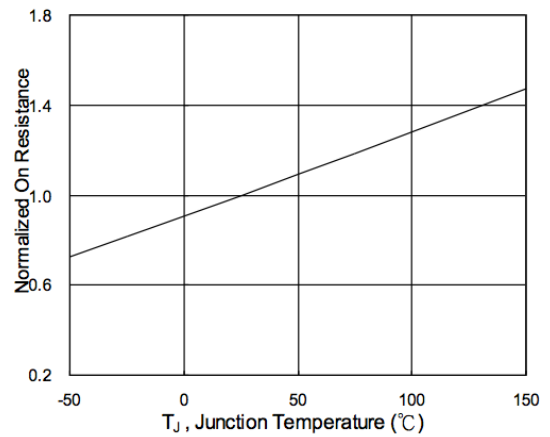


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

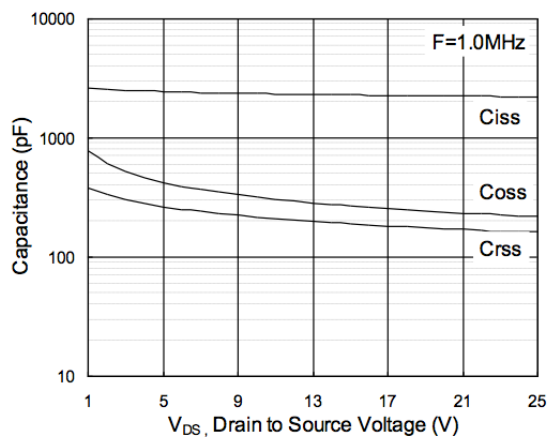


Fig.7 Capacitance

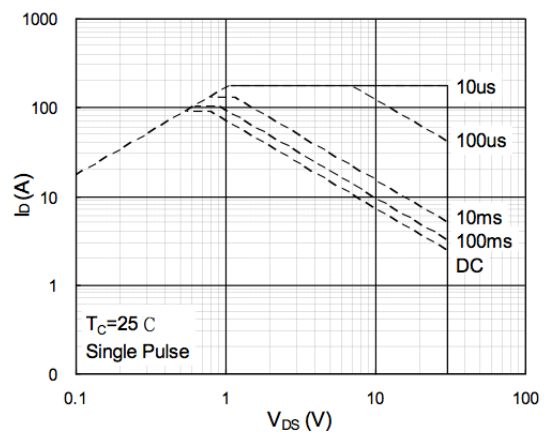


Fig.8 Safe Operating Area

TYPICAL CHARACTERISTICS (Tj=25°C unless otherwise noted)

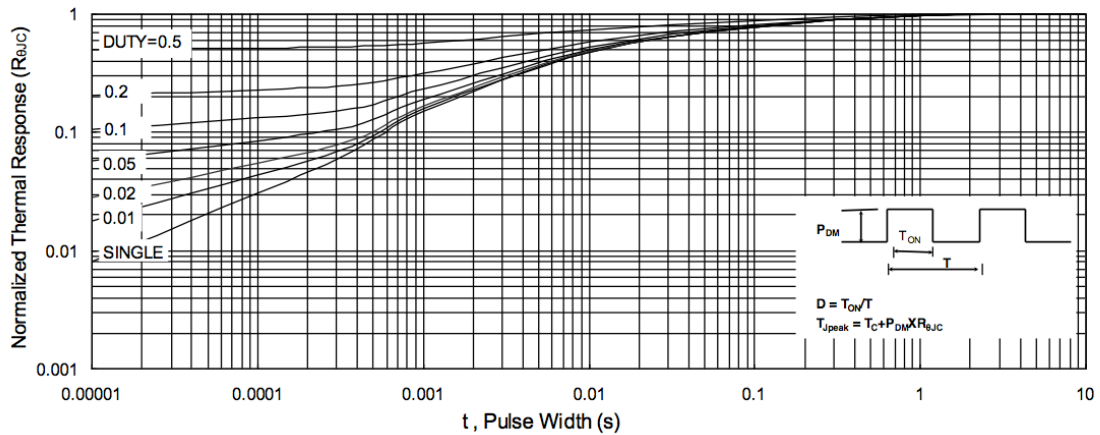


Fig.9 Normalized Maximum Transient Thermal Impedance

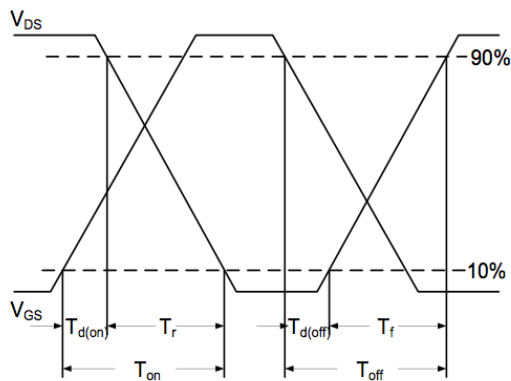


Fig.10 Switching Time Waveform

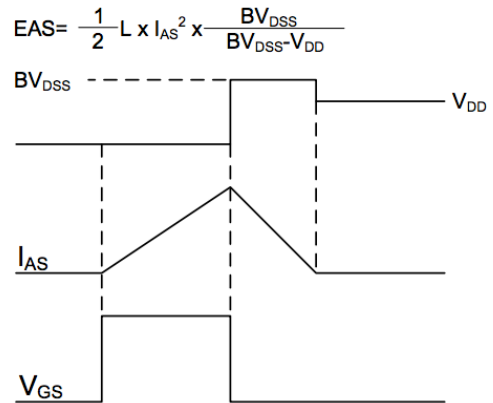
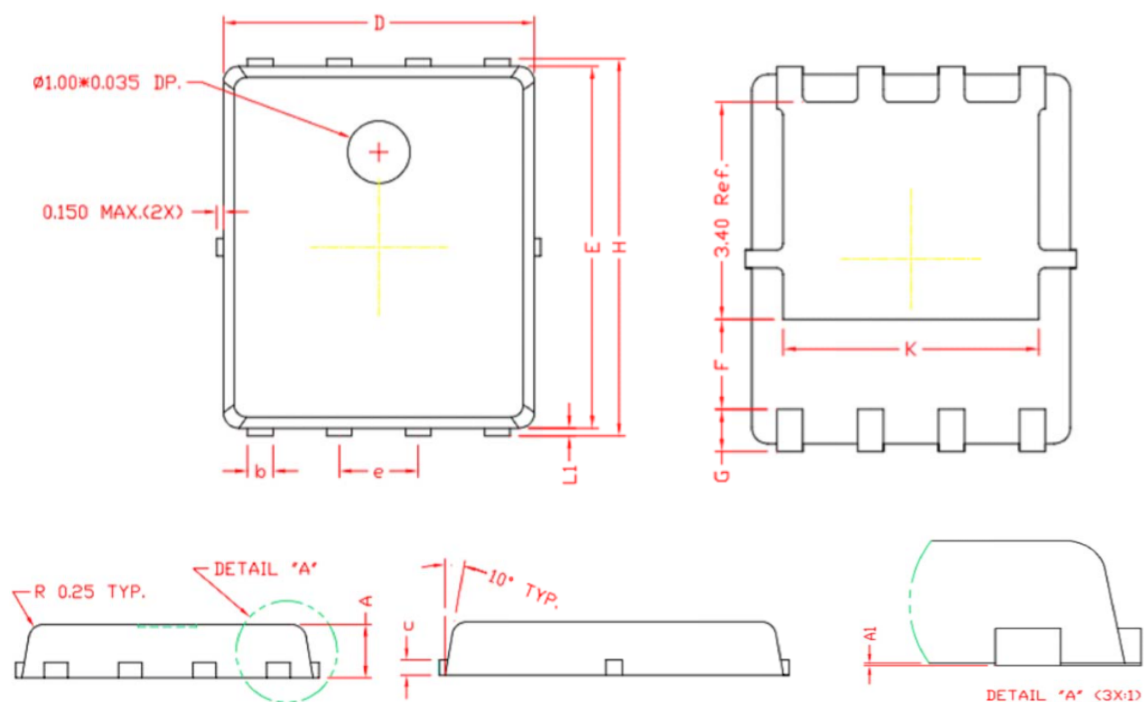


Fig.11 Unclamped Inductive Switching Waveform

POWER PACKAGE 5x6 OUTLINE



(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.80	0.90	1.00
A1	0.00	0.03	0.05
b	0.35	0.42	0.49
c	0.254 REF.		
D	4.90	5.00	5.10
F	1.40 REF.		
E	5.70	5.80	5.90
e	1.27 BSC.		
H	5.95	6.08	6.20
L1	0.10	0.14	0.18
G	0.60 REF.		
K	4.00 REF.		