

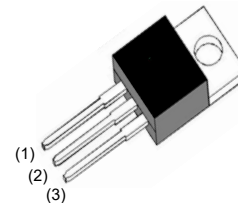
H40N25

N-Channel Power MOSFET

Features

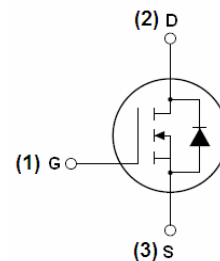
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent Cdv/dt effect decline
- Green Device Available

TO-220AB



Applications

- High Frequency Point-of-Load Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch



Schematic diagram

Absolute Maximum Ratings($T_C=25^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	250	V
I_D	Continuous Drain Current $T_C = 25^{\circ}\text{C}$	55	A
	Continuous Drain Current $T_C = 100^{\circ}\text{C}$	35	A
I_{DM}^{a1}	Pulsed Drain Current $T_C = 25^{\circ}\text{C}$	220	A
V_{GS}	Gate-to-Source Voltage	± 30	V
E_{AS}^{a2}	Single Pulse Avalanche Energy	2000	mJ
dv/dt^{a3}	Peak Diode Recovery dv/dt	5.0	V/ns
P_D	Power Dissipation $T_C = 25^{\circ}\text{C}$	300	W
	Derating Factor above 25°C	2.4	W/ $^{\circ}\text{C}$
T_J, T_{stg}	Operating Junction and Storage Temperature Range	-55 to 175	$^{\circ}\text{C}$

Electrical Characteristics (T_c=25°C, unless otherwise noted)

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V _{DSS}	Drain to Source Breakdown Voltage	V _{GS} =0V, I _D =250 μA	250	--	--	V
Δ BV _{DSS} / Δ T _J	Bvdss Temperature Coefficient	ID=250uA,Reference25℃	--	0.30	--	V/°C
I _{DSS}	Drain to Source Leakage Current	V _{DS} =250V, V _{GS} = 0V, T _J = 25℃	--	--	1	μA
		V _{DS} =200V, V _{GS} = 0V, T _J = 125℃			100	
I _{GSS(F)}	Gate to Source Forward Leakage	V _{DS} =0V, V _{GS} = 30V	--	--	100	nA
I _{GSS(R)}	Gate to Source Reverse Leakage	V _{DS} =0V, V _{GS} = -30V	--	--	-100	nA

ON Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
R _{DS(ON)}	Drain-to-Source On-Resistance	V _{GS} =10V,I _D =27.5A	--	56	69	mΩ
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250 μA	3.0	--	5.0	V
Pulse width tp ≤ 300 μs, δ ≤ 2%						

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
g _{fs}	Forward Trans conductance	V _{DS} =15V, I _D =55A		27	--	S
R _g	Gate resistance	f = 1.0MHz		2.7		Ω
C _{iss}	Input Capacitance	V _{GS} = 0V V _{DS} = 25V f = 1.0MHz	--	3350		pF
C _{oss}	Output Capacitance		--	463		
C _{rss}	Reverse Transfer Capacitance		--	33		

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
t _{d(ON)}	Turn-on Delay Time	I _D =55A V _{DD} = 125V R _G =10Ω	--	50		ns
t _r	Rise Time		--	179		
t _{d(OFF)}	Turn-Off Delay Time		--	83		
t _f	Fall Time		--	89		
Q _g	Total Gate Charge	I _D =55A V _{DD} =200V V _{GS} = 10V	--	63.6		nC
Q _{gs}	Gate to Source Charge		--	21.5		
Q _{gd}	Gate to Drain ("Miller")Charge		--	25.8		

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	55	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	220	A
V_{SD}	Diode Forward Voltage	$I_S=55A, V_{GS}=0V$	--	--	1.5	V
t_{rr}	Reverse Recovery Time	$I_S=55A, T_j = 25^\circ C$	--	242	--	ns
Q_{rr}	Reverse Recovery Charge	$dI_F/dt=100A/us, V_{GS}=0V$	--	2790	--	nC
I_{RRM}	Reverse Recovery Current		--	23.1	--	A
Pulse width $t_p \leq 300 \mu s, \delta \leq 2\%$						

Symbol	Parameter	Max.	Units
$R_{\theta JC}$	Junction-to-Case	2.5	$^\circ C/W$
$R_{\theta JA}$	Junction-to-Ambient	62.5	$^\circ C/W$

^{a1}: Repetitive rating; pulse width limited by maximum junction temperature

^{a2}: $L=10.0mH, I_D=20.0A$, Start $T_j=25^\circ C$

^{a3}: $I_{SD}=55A, di/dt \leq 100A/us, V_{DD} \leq BV_{DS}$, Start $T_j=25^\circ C$

Typical Characteristics

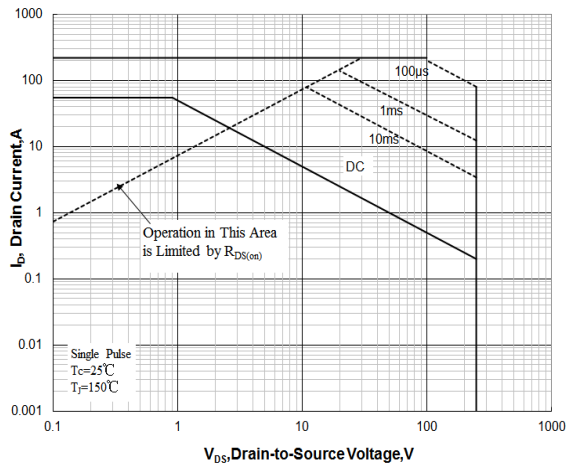


Figure 1 Maximum Forward Bias Safe Operating Area

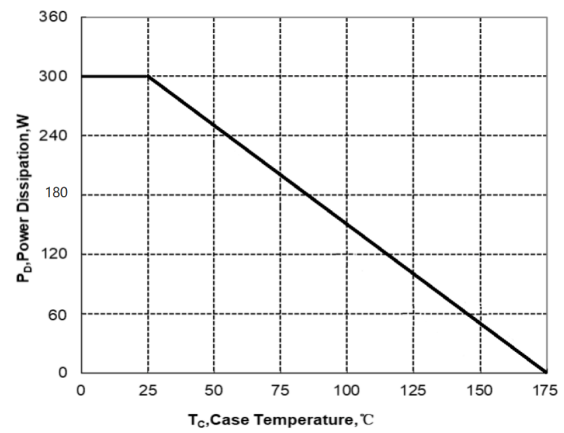


Figure 2 Maximum Power dissipation vs Case Temperature

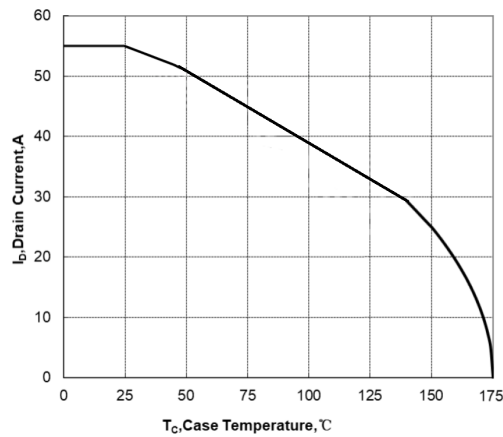


Figure 3 Maximum Continuous Drain Current vs Case Temperature

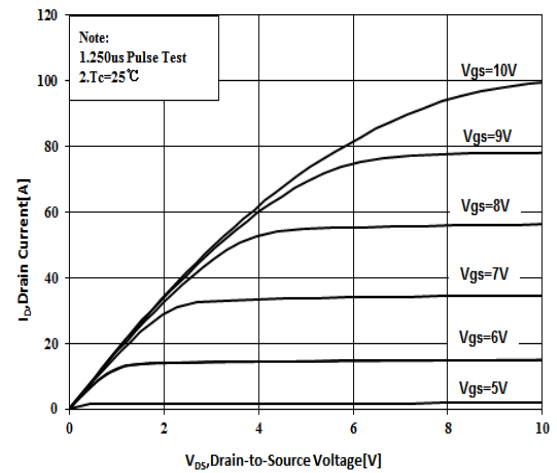


Figure 4 Typical Output Characteristics

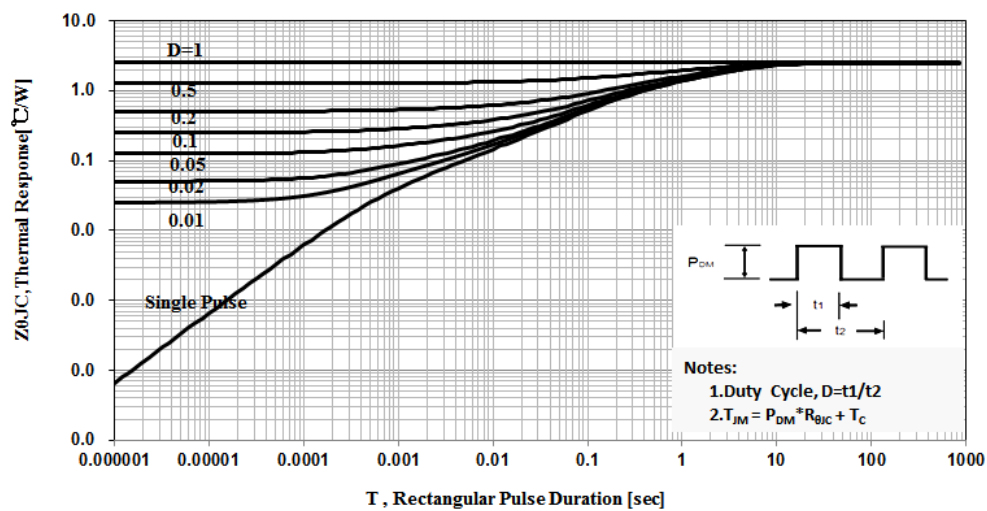


Figure 5 Maximum Effective Thermal Impedance , Junction to Case

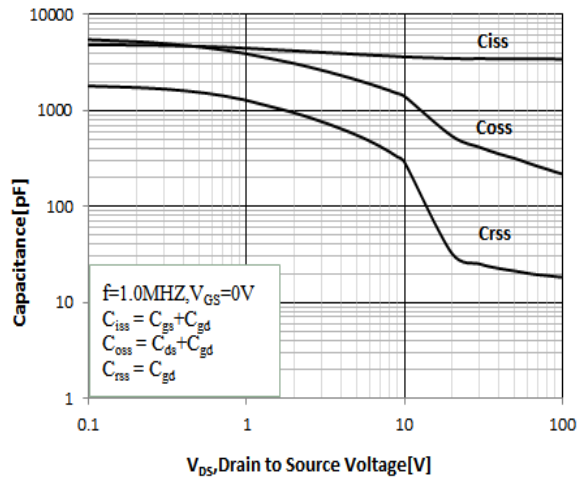


Figure 6 Typical Capacitance vs Drain to Source Voltage

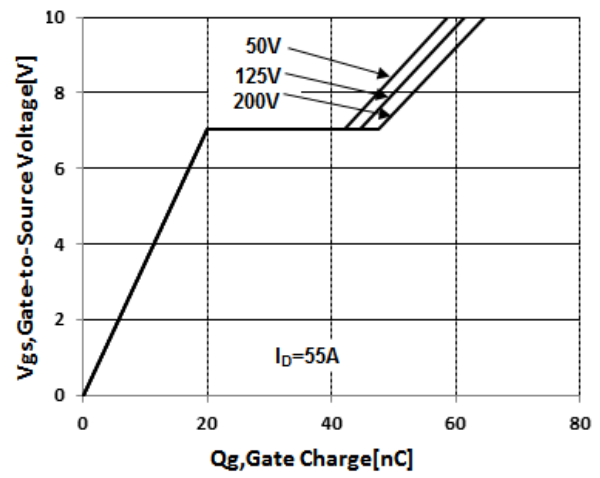


Figure 7 Typical Gate Charge vs Gate to Source Voltage

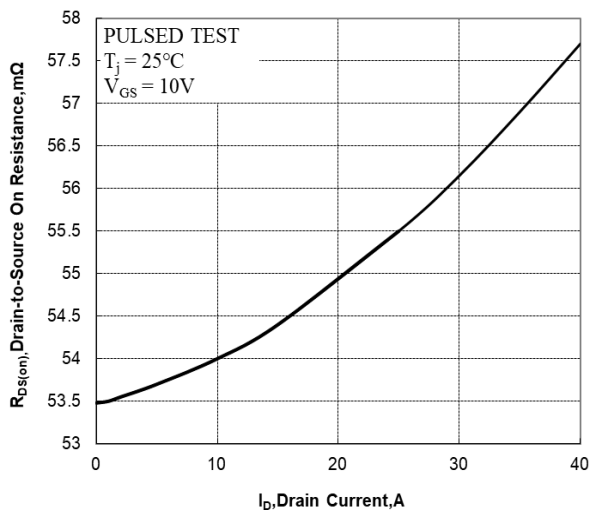


Figure 8 Typical Drain to Source ON Resistance vs Drain Current

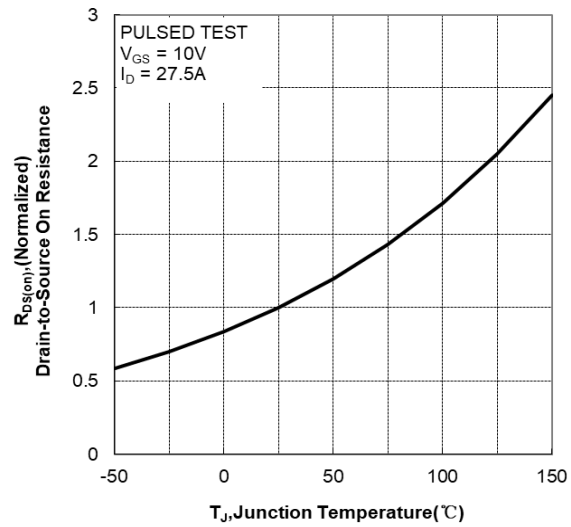
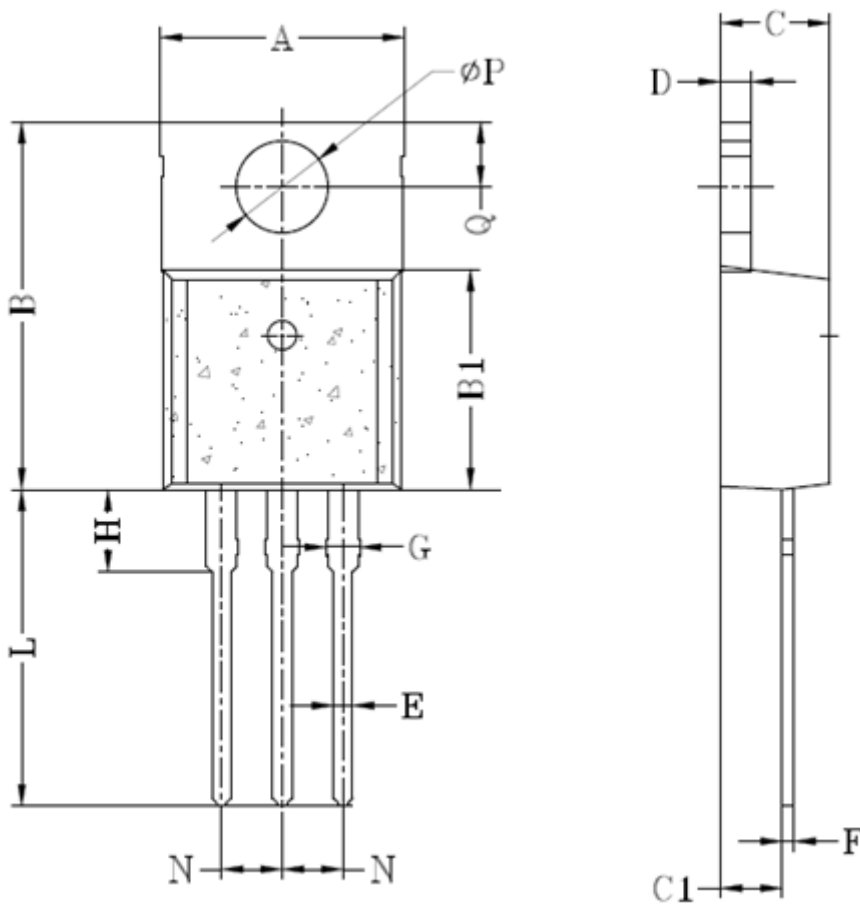


Figure 9 Typical Drain to Source on Resistance vs Junction Temperature

Package mechanical data



Symbol	unit(mm)	
	MIN	MAX
A	10.0	10.4
B	15.2	15.6
B1	9.00	9.60
C	4.47	4.67
C1	2.28	2.88
D	1.20	1.40
E	0.70	0.90
F	0.40	0.60
G	1.27	1.47
H	3.20	3.70
L	12.95	13.55
N	2.34	2.74
Q	2.44	3.04
ϕP	3.74	3.94

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