AP75N65S

N-Channel Super Junction Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
650V	41mΩ@10V	75A

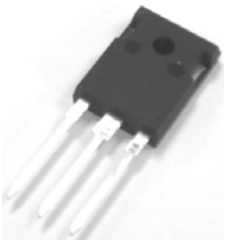
Feature

- Low on-resistance and low conduction losses
- Ultra Low Gate Charge cause lower driving requirements
- New technology for high voltage device

Application

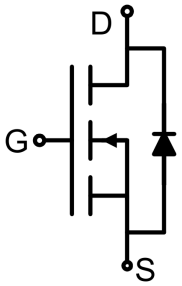
- Power factor correction
- Switched mode power supplies
- Uninterruptible Power Supply

Package

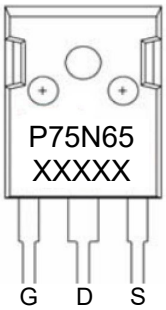


TO-247AB

Circuit diagram



Marking



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N-Channel Super Junction Power MOSFET

Absolute maximum ratings (Ta=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current	I_D	75	A
Drain Current-Continuous(T_C =100 °C)	I_D (100 °C)	47	A
Pulsed Drain Current	I_{DM}	300	A
Power Dissipation	P_D	510	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	0.245	℃/W
Single pulse avalanche energy	E_{AS}	1936	mJ
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_A=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =500μA	650			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =650V,V_{GS} = 0V			5	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =500μA	2.5		4.5	V
Drain-source on-resistance[1)]	$R_{DS(on)}$	V_{GS} =10V, I_D =38A		36	41	mΩ
Dynamic characteristics[2)]						
Input Capacitance	C_{iss}	V_{DS} =100V,V_{GS} =0V,f =1MHz		7300		pF
Output Capacitance	C_{oss}			252		
Reverse Transfer Capacitance	C_{rss}			4		
Total Gate Charge	Q_g	V_{DS} =480V,V_{GS} =10V,ID =75A		116		nC
Gate-Source Charge	Q_{gs}			40		
Gate-Drain Charge	Q_{gd}			30		
Turn-on delay time	$t_{d(on)}$	V_{DD}=380V,V_{GS}=10V, I_D =38A,R_{GEN}=1.2Ω		27		nS
Turn-on rise time	t_r			22		
Turn-off delay time	$t_{d(off)}$			118		
Turn-off fall time	t_f			13		
Source-Drain Diode characteristics						
Diode Forward Current[1)]	I_S				75	A
Diode Forward voltage	V_{DS}	V_{GS} =0V, I_S=75A			1.3	V
Reverse Recovery Time	t_{rr}	TJ = 25°C, IF =38A di/dt = 100A/μs [1)]		230		nS
Reverse Recovery Charge	Q_{rr}			3		μC

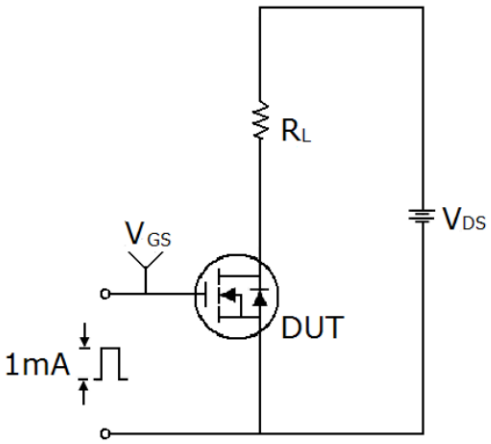
Notes:

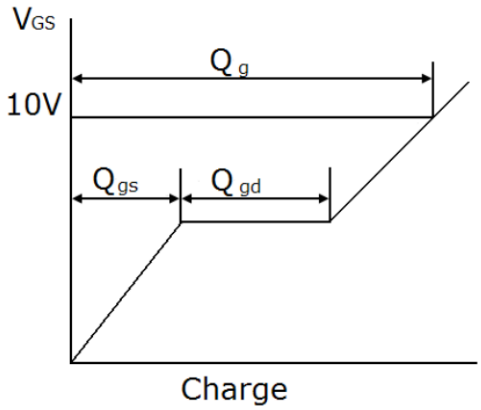
1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.

2) Guaranteed by design, not subject to production testing.

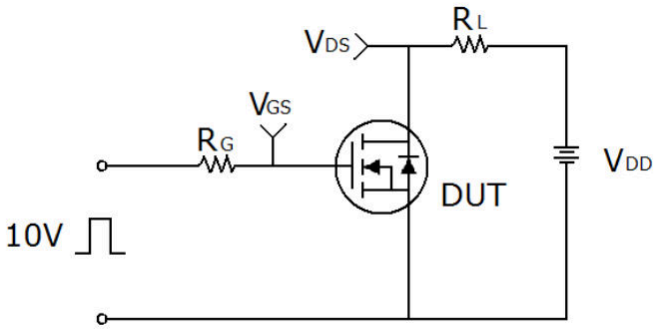
Test Circuit

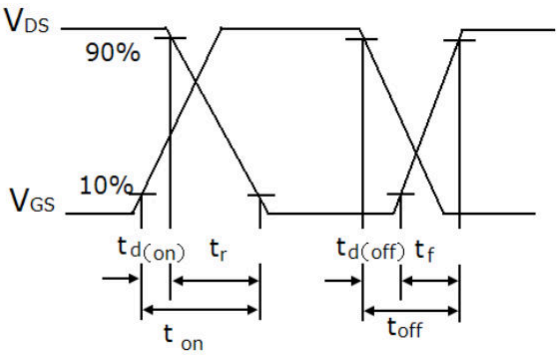
1) Gate charge test circuit & Waveform



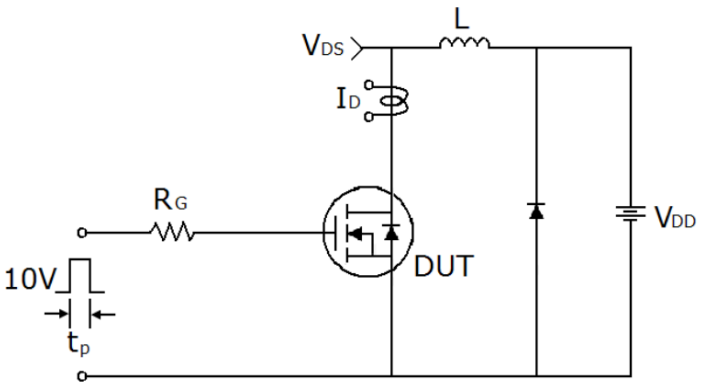


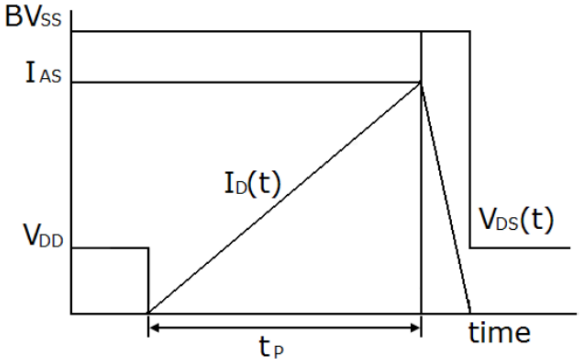
2) Switch Time Test Circuit





3) Unclamped Inductive Switching Test Circuit & Waveforms





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Typical Characteristics

Figure1. Safe Operating Area

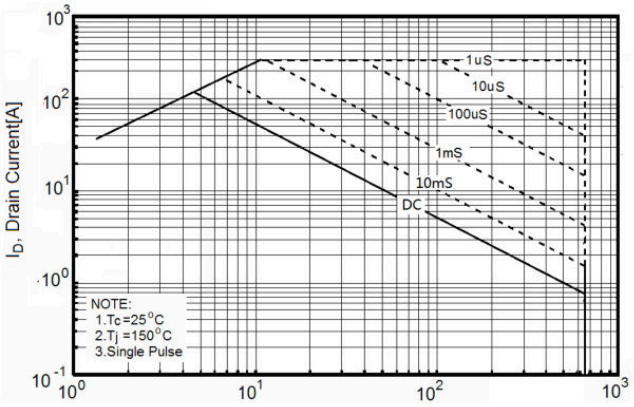


Figure2. Source-Drain Diode Forward Voltage

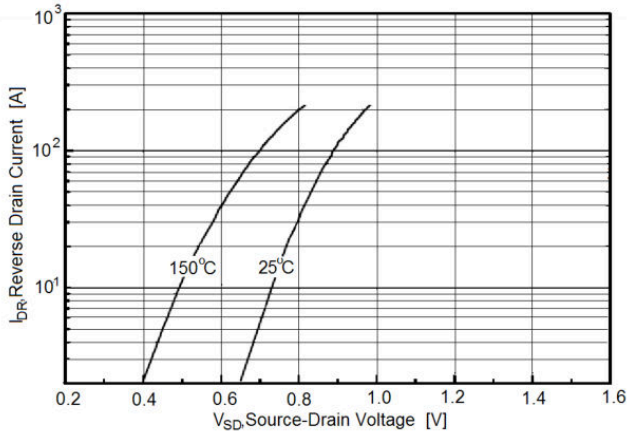


Figure3. Output Characteristics

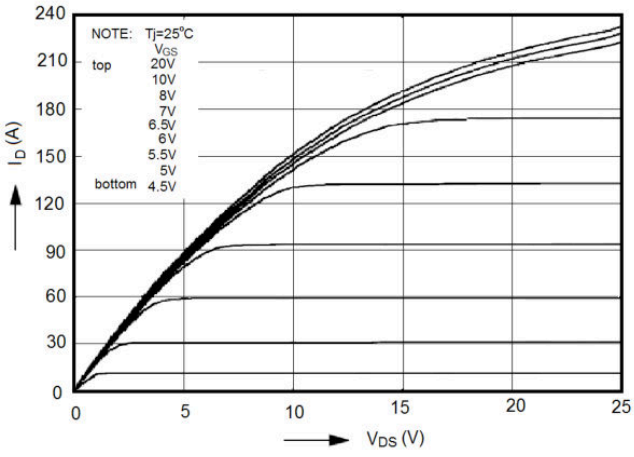


Figure4. Transfer Characteristics

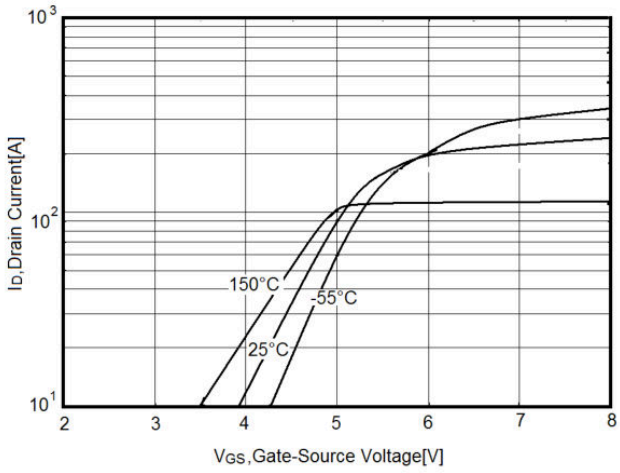


Figure5. Static drain-source on resistance

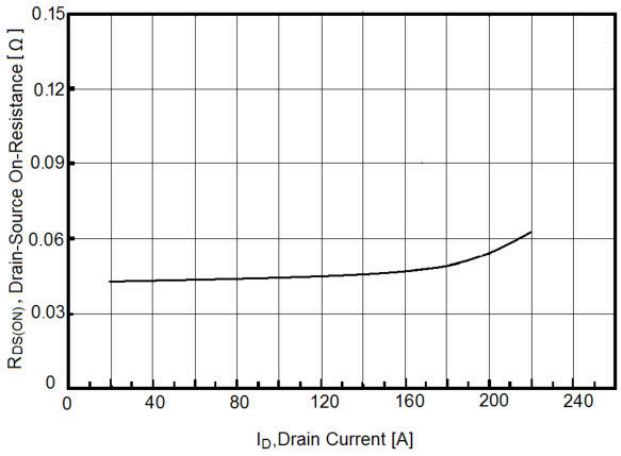
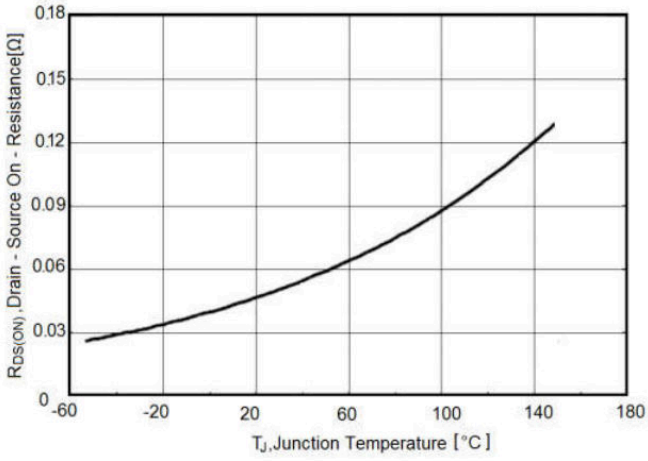


Figure6. $R_{DS(ON)}$ vs Junction Temperature



Typical Characteristics

Figure7. BV_{DSS} vs Junction Temperature

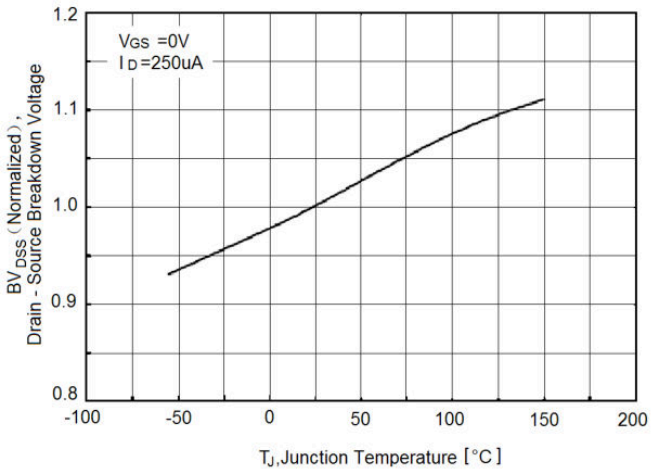
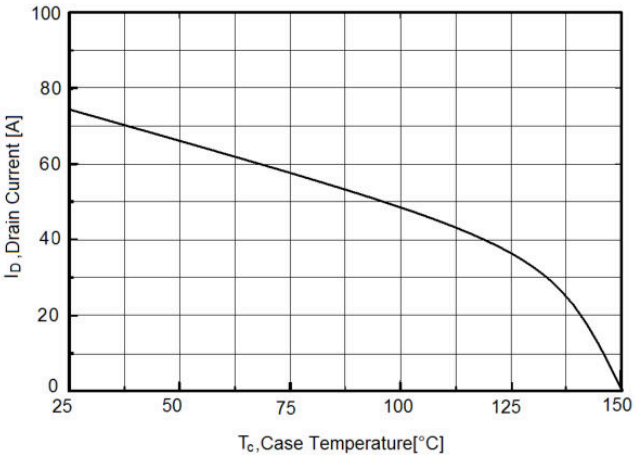
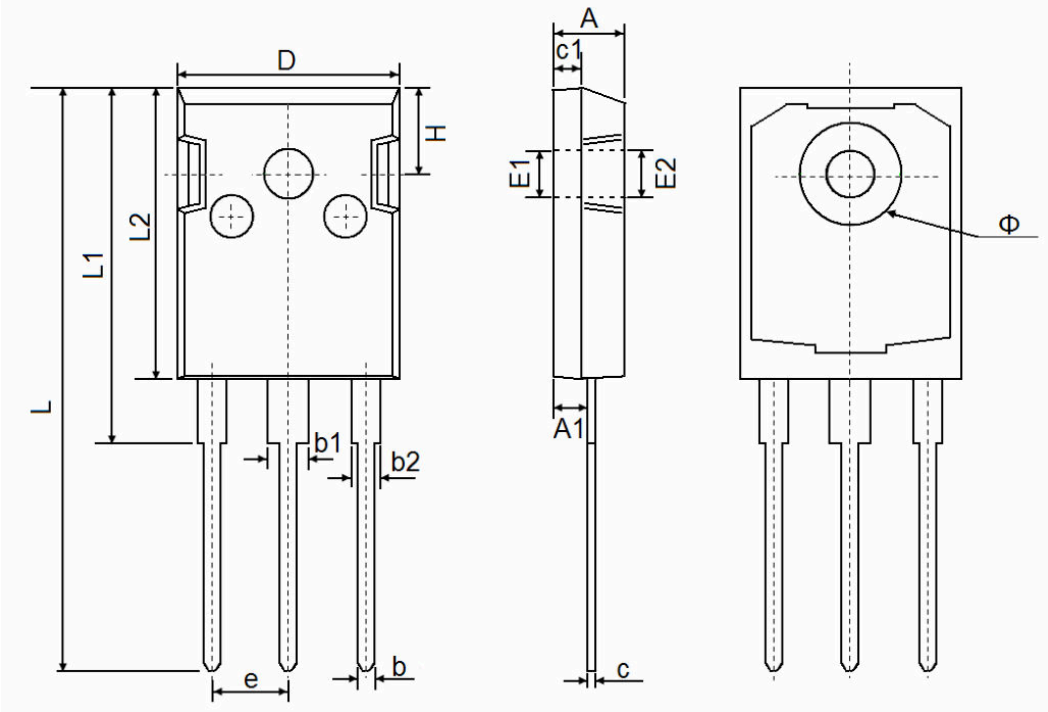


Figure8. Maximum I_D vs Junction Temperature



TO-247AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.850	5.150	0.191	0.200
A1	2.200	2.600	0.087	0.102
b	1.000	1.400	0.039	0.055
b1	2.800	3.200	0.110	0.126
b2	1.800	2.200	0.071	0.087
c	0.500	0.700	0.020	0.028
c1	1.900	2.100	0.075	0.083
D	15.450	15.750	0.608	0.620
E1	3.500 REF		0.138 REF	
E2	3.600 REF		0.142 REF	
L	40.900	41.300	1.610	1.626
L1	24.800	25.100	0.976	0.988
L2	20.300	20.600	0.799	0.811
Φ	7.100	7.300	0.280	0.287
e	5.450 TYP		0.215 TYP	
H	5.980 REF		0.235 REF	