

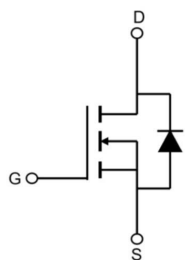
TO-220AB N-Channel Enhancement Mode Power MOSFET

Features:

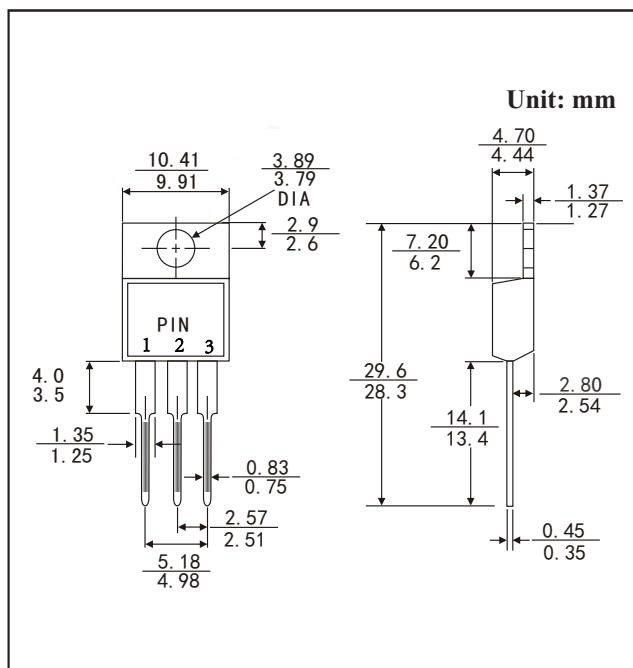
- $V_{DS}=100V, I_D=30A^{(1)}$
 $R_{DS(ON) Typ} : 32m\Omega @ V_{GS}=10V^{(1)}$
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge

Application:

- Load Switch
- PWM Application
- Power Management



Schematic Diagram



Absolute Maximum Ratings (@ $T_J = 25^\circ C$ unless otherwise specified)

Symbol	Parameter	Value	Units
V_{DS}	Drain-to-Source Voltage	100	V
V_{GS}	Gate-to-Source Voltage	± 20	V
I_D	Continuous Drain Current	$T_C = 25^\circ C$	30
		$T_C = 100^\circ C$	18
I_{DM}	Pulsed Drain Current ⁽¹⁾	120	A
E_{AS}	Single Pulsed Avalanche Energy ⁽²⁾	64	mJ
P_D	Power Dissipation	$T_C = 25^\circ C$	83
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.5	$^\circ C/W$
T_J, T_{STG}	Junction & Storage Temperature Range	-55 to 150	$^\circ C$

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Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	I _D = 250μA, V _{GS} = 0V	100	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 100V, V _{GS} = 0V	-	-	1.0	μA
I _{GSS}	Gate-Body Leakage Current	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1		2.5	V
R _{DS(ON)}	Static Drain-Source ON-Resistance ⁽²⁾	V _{GS} = 10V, I _D = 20A	-		32	mΩ
		V _{GS} = 4.5V, I _D = 10A	-		34	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 25V, f = 1MHz	-	3033	-	pF
C _{oss}	Output Capacitance		-	130	-	pF
C _{rss}	Reverse Transfer Capacitance		-	113	-	pF
Q _g	Total Gate Charge	V _{GS} = 0 to 10V V _{DS} = 30V, I _D = 15A	-	66	-	nC
Q _{gs}	Gate Source Charge		-	10	-	nC
Q _{gd}	Gate Drain("Miller") Charge		-	14	-	nC
Switching Characteristics						
t _{d(on)}	Turn-On DelayTime	V _{GS} = 10V, V _{DD} = 30V I _D = 15A, R _{GEN} = 1.8Ω	-	11	-	ns
t _r	Turn-On Rise Time		-	45	-	ns
t _{d(off)}	Turn-Off DelayTime		-	67	-	ns
t _f	Turn-Off Fall Time		-	48	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	30	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	120	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S = 30A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I _F = 30A, di/dt = 100A/us	-	28	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	40	-	nC

- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
 2. E_{AS} condition: Starting $T_J = 25^\circ\text{C}$, $V_{DD} = 30\text{V}$, $V_G = 10\text{V}$, $R_G = 25\text{ohm}$, $L = 0.5\text{mH}$, $I_{AS} = 16\text{A}$
 3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$.

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Test Circuit

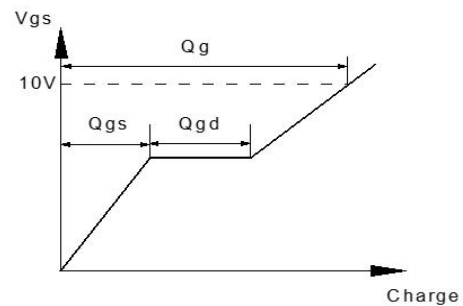
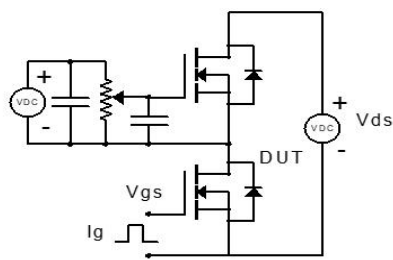


Figure 1: Gate Charge Test Circuit & Waveform

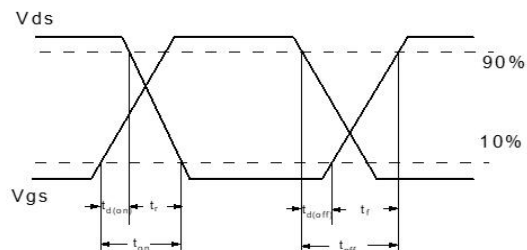
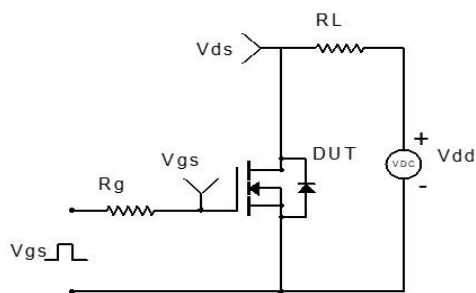


Figure 2: Resistive Switching Test Circuit & Waveform

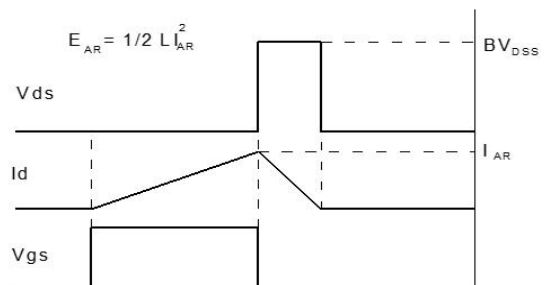
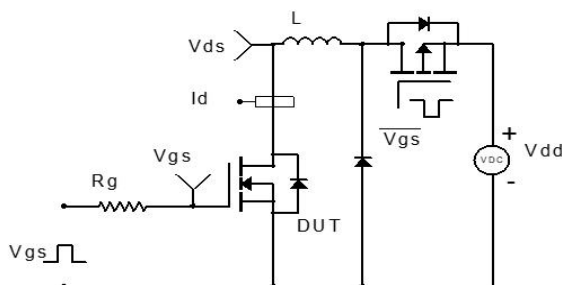


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

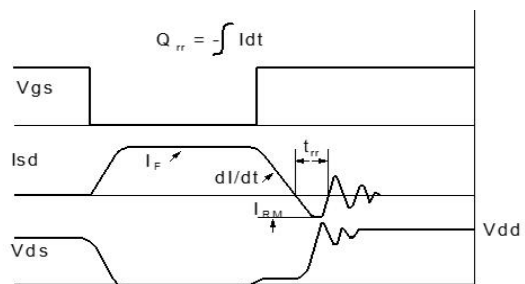
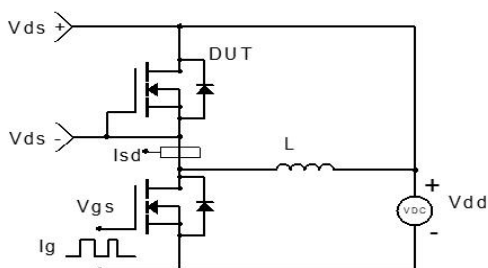


Figure 4: Diode Recovery Test Circuit & Waveform