

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
150V	78mΩ@10V	30A
	90mΩ@4.5V	

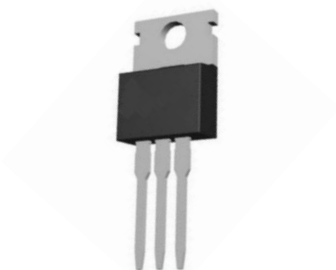
Feature

- Advanced SGT technology
- Excellent $R_{DS(ON)}$
- Low gate charge

Application

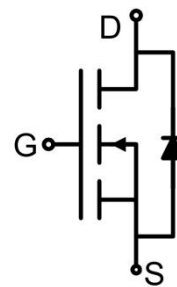
- Automotive lighting
- Load switch
- Uninterruptible power supply

Package



TO-220AB

Circuit diagram



Marking



Absolute maximum ratings($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($V_{GS}=10\text{V}$)	I_D	30	A
Continuous Drain Current ($V_{GS}=10\text{V}$, $T_C=100^{\circ}\text{C}$)	$I_D (100^{\circ}\text{C})$	21	A
Pulsed Drain Current ¹⁾	I_{DM}	90	A
Power Dissipation	P_D	60	W
Thermal Resistance from Junction to Case ²⁾	$R_{\theta JC}$	2.5	$^{\circ}\text{C/W}$
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

Electrical characteristics ($T_J=25^{\circ}\text{C}$, 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 =250μA	150			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =150V,V _{GS} =0V			1	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 =250μA	2	3	4.5	V
Drain-source on-resistance ²⁾	R _{DS(on)}	V _{GS} =10V, I _D =10A		63	78	mΩ
		V _{GS} =4.5V, I _D =8A		72	90	
Dynamic characteristics ³⁾						
Input Capacitance	C _{iss}	V _{DS} =75V, V _{GS} =0V, f =1MHz		630		pF
Output Capacitance	C _{oss}			50		
Reverse Transfer Capacitance	C _{rss}			13.5		
Total Gate Charge	Q _g	V _{DD} =75V, V _{GS} =10V, I _D =10A		11		nC
Gate-Source Charge	Q _{gs}			1.2		
Gate-Drain Charge	Q _{gd}			4		
Turn-on delay time	t _{d(on)}	V _{DD} =75V, V _{GS} =10V, I _D =10A R _G =10Ω		9.8		nS
Turn-on rise time	t _r			6		
Turn-off delay time	t _{d(off)}			15		
Turn-off fall time	t _f			4.1		
Source-Drain Diode characteristics						
Diode Continuous Current	I _S				30	A
Diode Forward voltage ²⁾	V _{SD}	V _{GS} =0V, I _S =10A			1.2	V
Reverse recover time	T _{rr}	I _F =10A, di/dt =100A/us, V _R =75V		55		nS
Reverse recovery charge	Q _{rr}			124		nC

Notes:

- 1) The data tested by surface mounted on a 1 inch ² FR-4 board with 20Z copper.
- 2) The data tested by pulsed , pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- 3) Guaranteed by design, not subject to production testing.

Typical Characteristics

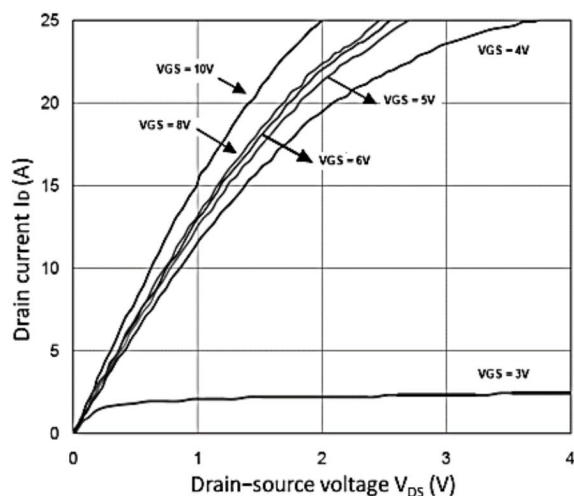


Figure 1. Output Characteristics

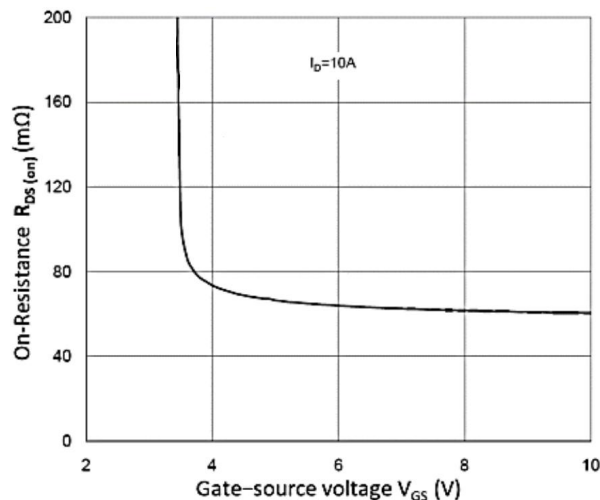


Figure 2. R_DS(on) vs. V_GS

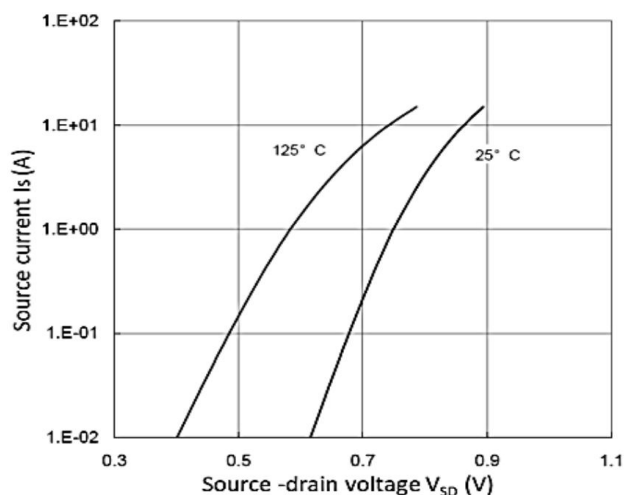


Figure 3. Forward Characteristics of Reverse

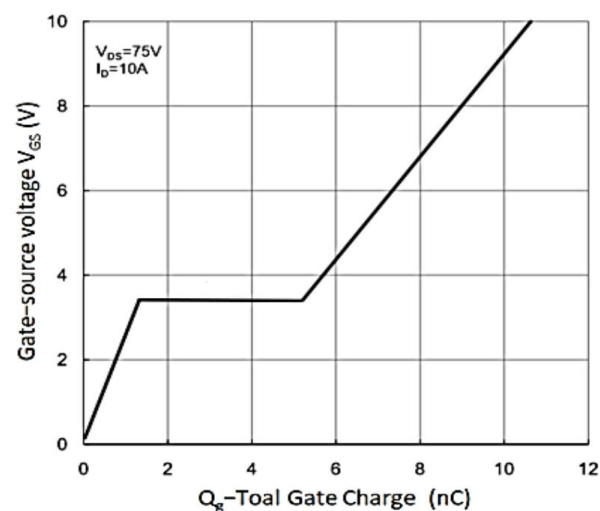


Figure 4. Gate Charge Characteristics

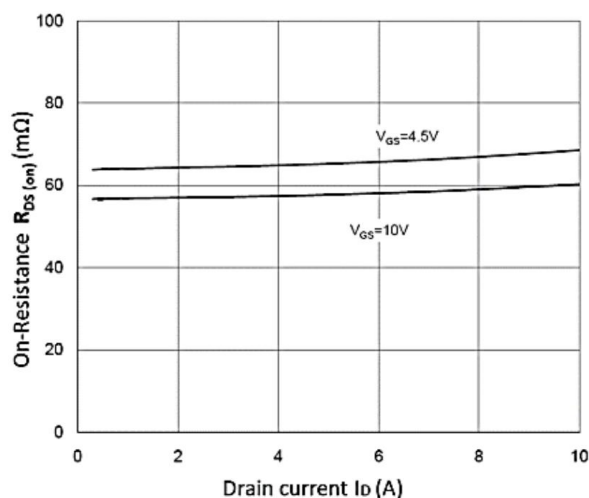


Figure 5. R_DS(ON) vs. I_D

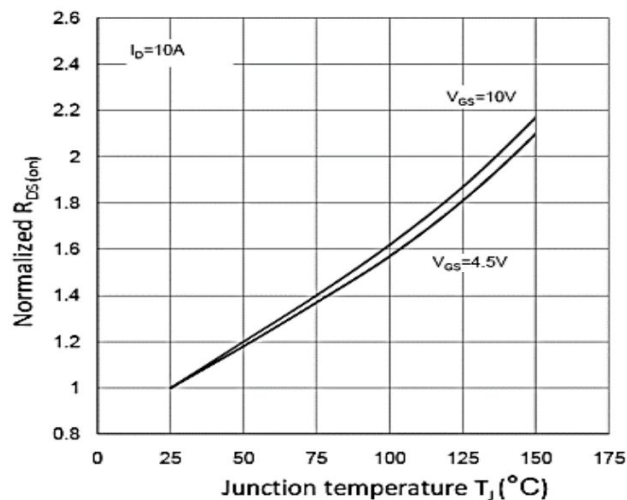


Figure 6. Normalized R_DS(on) vs. T_J

Typical Characteristics

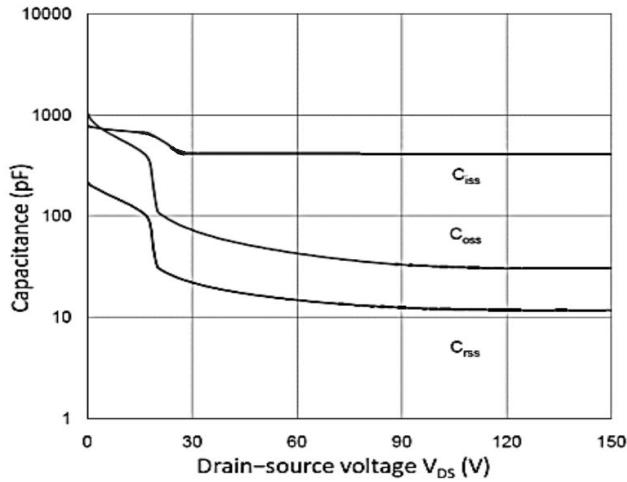


Figure 7. Capacitance Characteristics

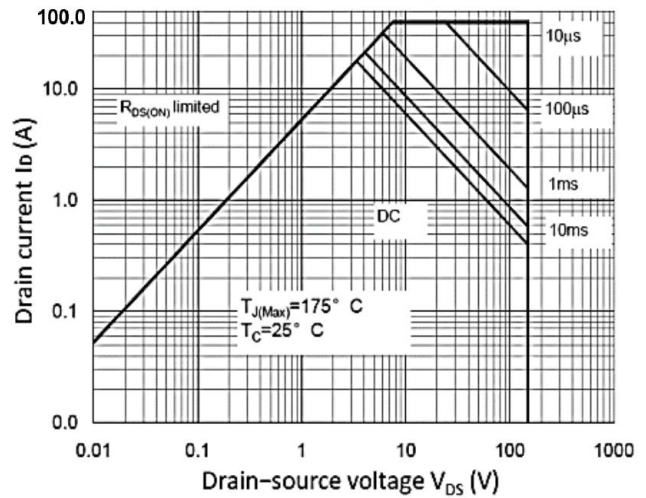


Figure 8. Safe Operating Area

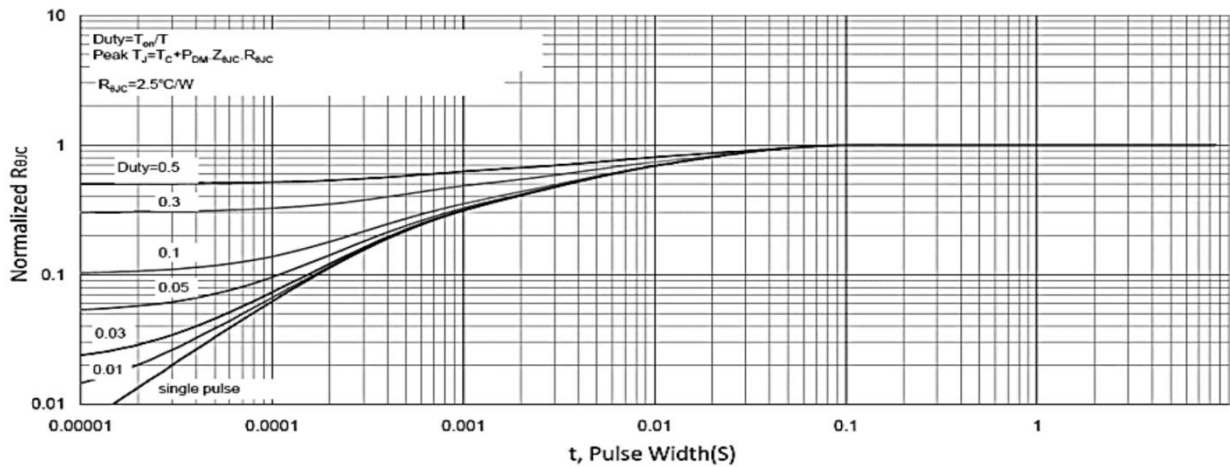


Figure 9. Normalized Maximum Transient Thermal Impedance

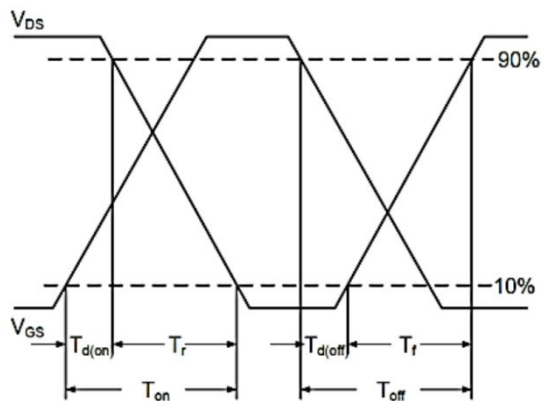


Figure 10. Switching Time Waveform

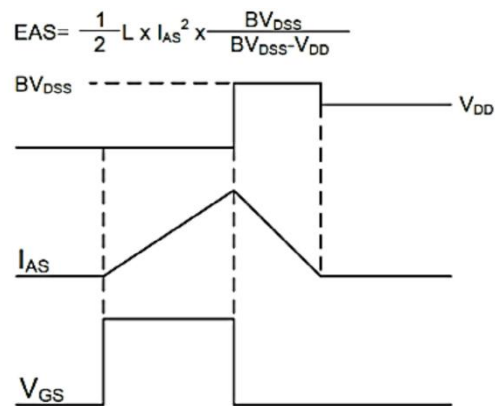
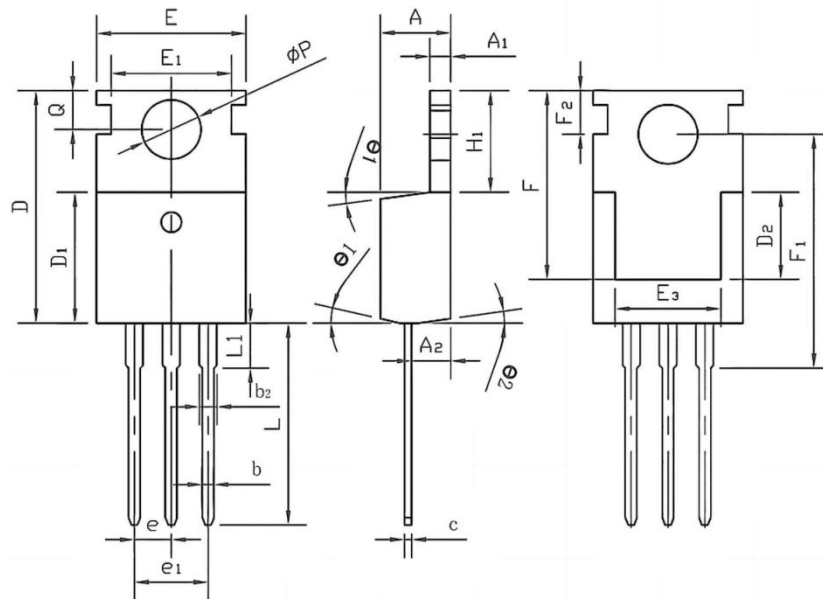


Figure 11. Unclamped Inductive Switching

TO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.270	4.870	0.168	0.192
A1	1.150	1.450	0.045	0.057
A2	2.100	2.700	0.083	0.106
b	0.700	1.000	0.028	0.039
b2	1.170	1.500	0.046	0.059
D	0.400	0.650	0.016	0.026
D1	8.800	9.400	0.346	0.370
D2	5.700	7.000	0.224	0.276
E	9.700	10.300	0.382	0.406
E1	8.700 REF.		0.343 REF.	
E2	9.630	10.350	0.379	0.407
E3	7.000	8.400	0.276	0.331
e	0.370 BSC.		0.015 BSC.	
e1	0.100 BSC.		0.004 BSC.	
H1	6.000	6.850	0.236	0.270
L	12.750	13.900	0.502	0.547
L1	-	3.400	-	0.134
ϕp	3.450	3.750	0.136	0.148
Q	2.600	3.000	0.102	0.118
θ_1	4°	10°	4°	10°
θ_2	0°	6°	0°	6°
F	13.300	13.700	0.524	0.539
F1	15.500	16.300	0.610	0.642
F2	2.800	3.200	0.110	0.126