

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
100V	6.8mΩ@10V	130A

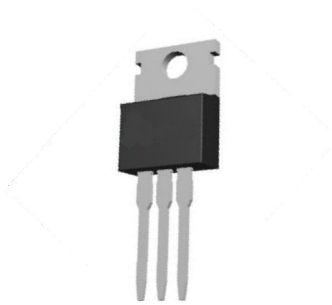
### Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high  $E_{AS}$
- Excellent package for good heat dissipation

### Application

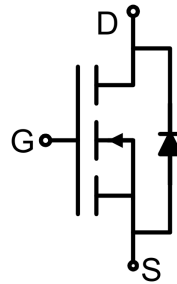
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

### Package

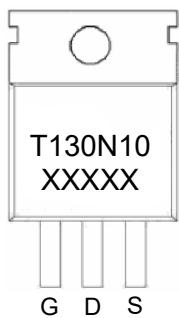


TO-220AB

### Circuit diagram



### Marking



### Absolute maximum ratings (Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	130	A
Pulsed Drain Current	$I_{DM}$	500	A
Power Dissipation	$P_D$	285	W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.53	°C/W
Single pulse avalanche energy	$E_{AS}$	1100	mJ
Junction Temperature	$T_J$	150	°C
Storage Temperature	$T_{STG}$	-55 ~ +150	°C

### Electrical characteristics (T<sub>A</sub>=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	100			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 100V, V_{GS} = 0V$			1	μA
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			±100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2		4	V
Drain-source on-resistance <sup>1)</sup>	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		5.3	6.8	mΩ
Forward transconductance <sup>1)</sup>	$g_{FS}$	$V_{DS} = 5V, I_D = 20A$	40			S
<b>Dynamic characteristics<sup>2)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 50V, V_{GS} = 0V, f = 1MHz$		7100		pF
Output Capacitance	$C_{oss}$			413		
Reverse Transfer Capacitance	$C_{rss}$			333		
Total Gate Charge	$Q_g$	$V_{DS} = 50V, V_{GS} = 10V, I_D = 65A$		170		nC
Gate-Source Charge	$Q_{gs}$			38		
Gate-Drain Charge	$Q_{gd}$			65		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 50V, V_{GS} = 10V, R_L = 2.5\Omega, R_{GEN} = 3\Omega$		31		nS
Turn-on rise time	$t_r$			24		
Turn-off delay time	$t_{d(off)}$			45		
Turn-off fall time	$t_f$			27		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current <sup>1)</sup>	$I_S$				130	A
Diode Forward voltage	$V_{DS}$	$V_{GS} = 0V, I_S = 40A$			1.2	V
Reverse Recovery Time	$t_{rr}$	$T_J = 25^\circ C, I_F = 20A, di/dt = 100A/\mu s^1)$		65		nS
Reverse Recovery Charge	$Q_{rr}$			110		nC

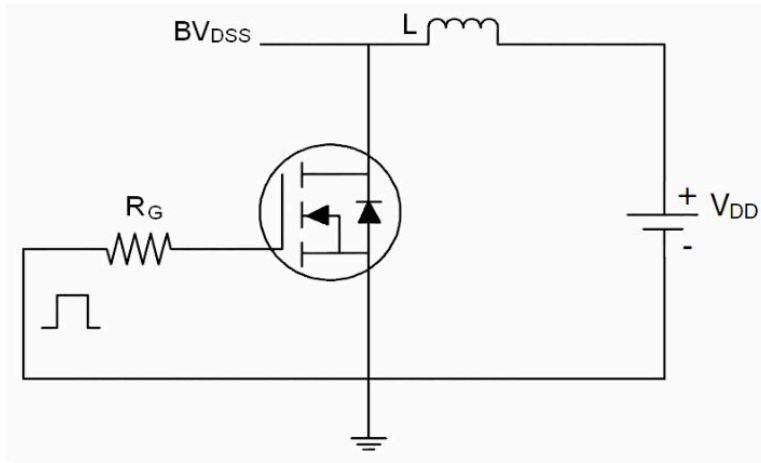
Notes:

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

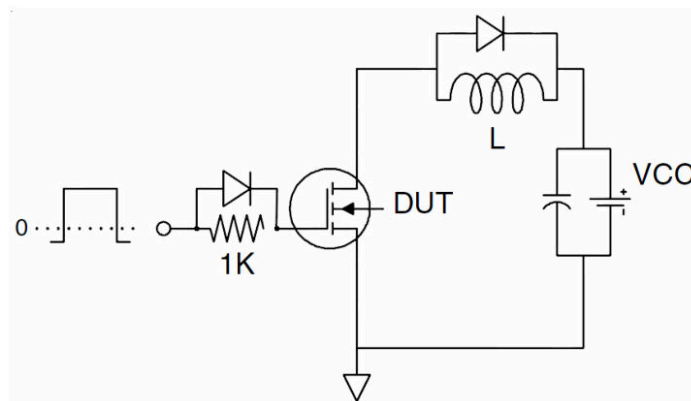
2) Guaranteed by design, not subject to production testing.

## Test Circuit

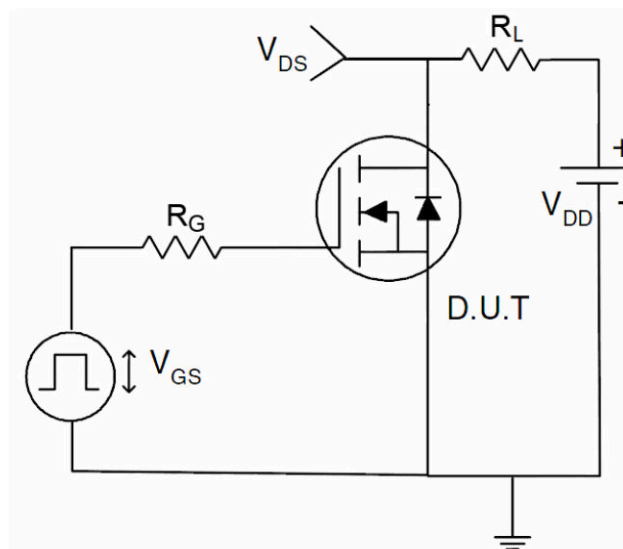
### 1) $E_{AS}$ test Circuit



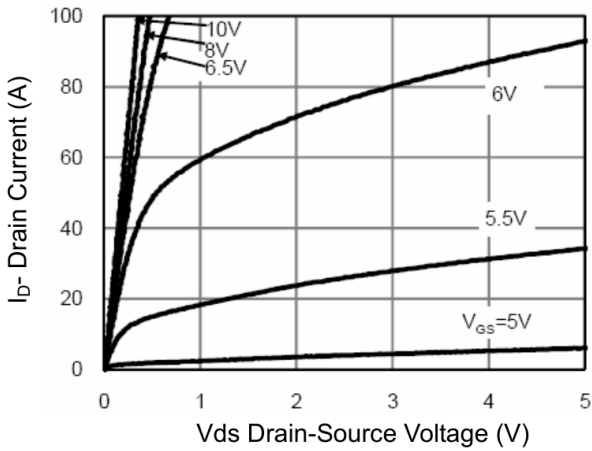
### 2) Gate charge test Circuit



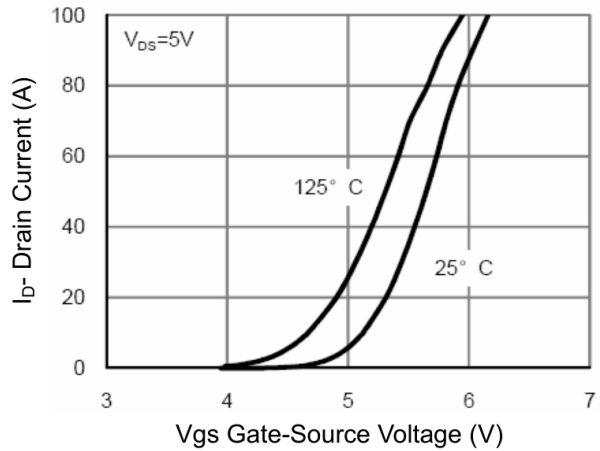
### 3) Switch Time Test Circuit



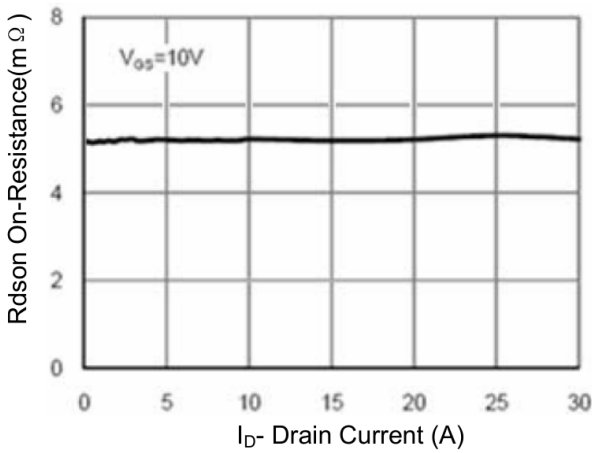
## Typical Characteristics



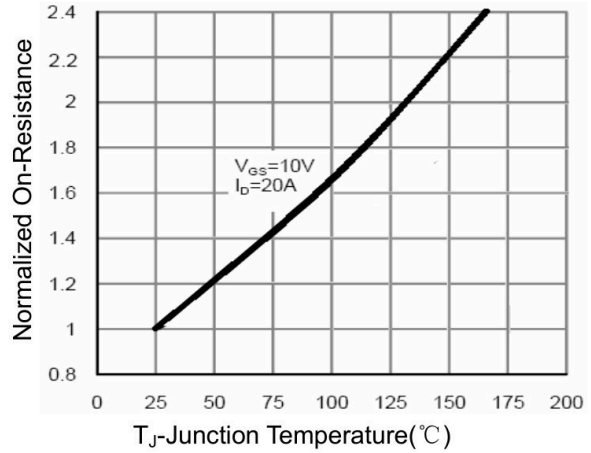
**Figure 1 Output Characteristics**



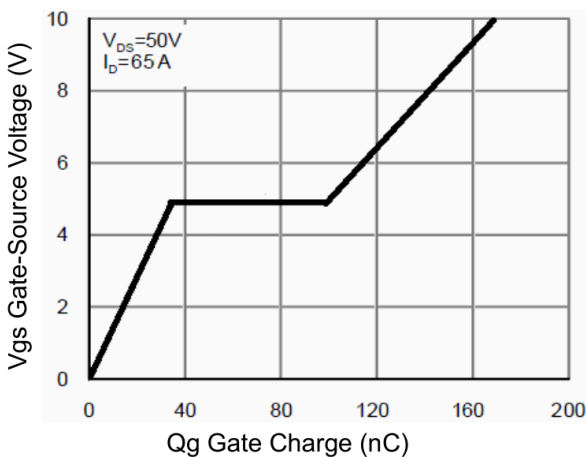
**Figure 2 Transfer Characteristics**



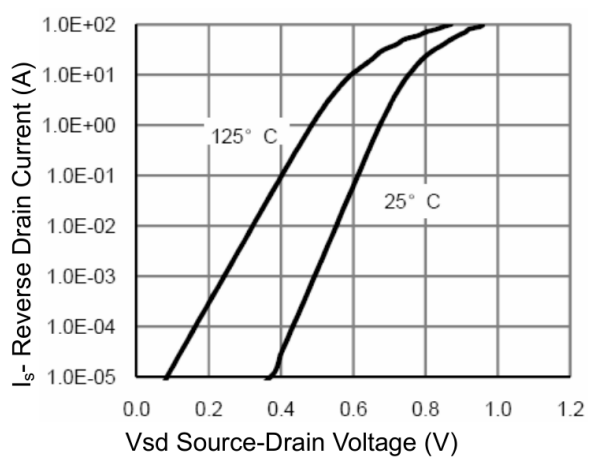
**Figure 3 Rdson- Drain Current**



**Figure 4 Rdson-Junction Temperature**

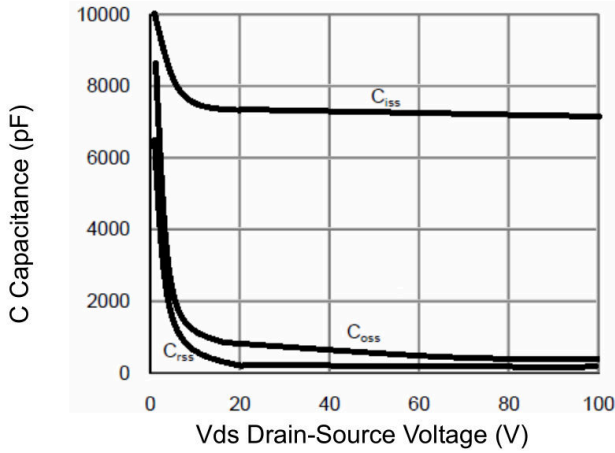


**Figure 5 Gate Charge**

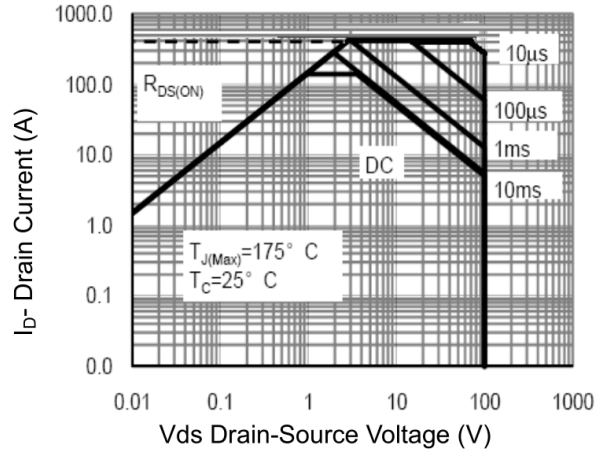


**Figure 6 Source- Drain Diode Forward**

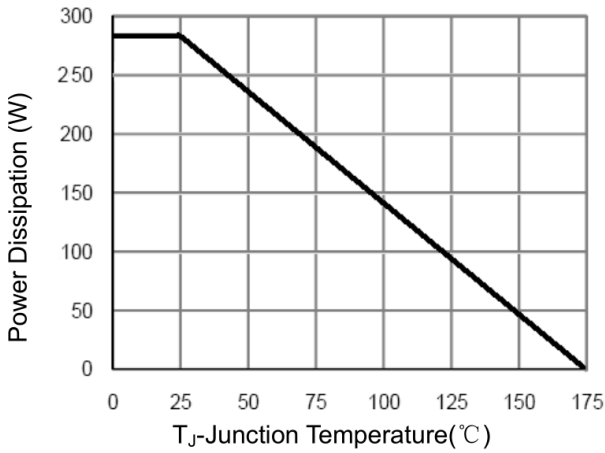
## Typical Characteristics



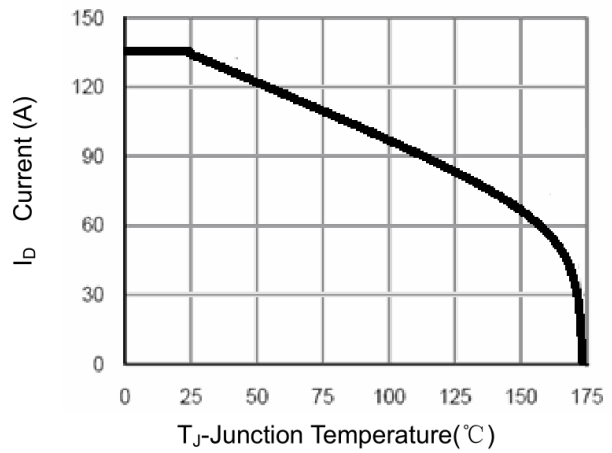
**Figure 7 Capacitance vs Vds**



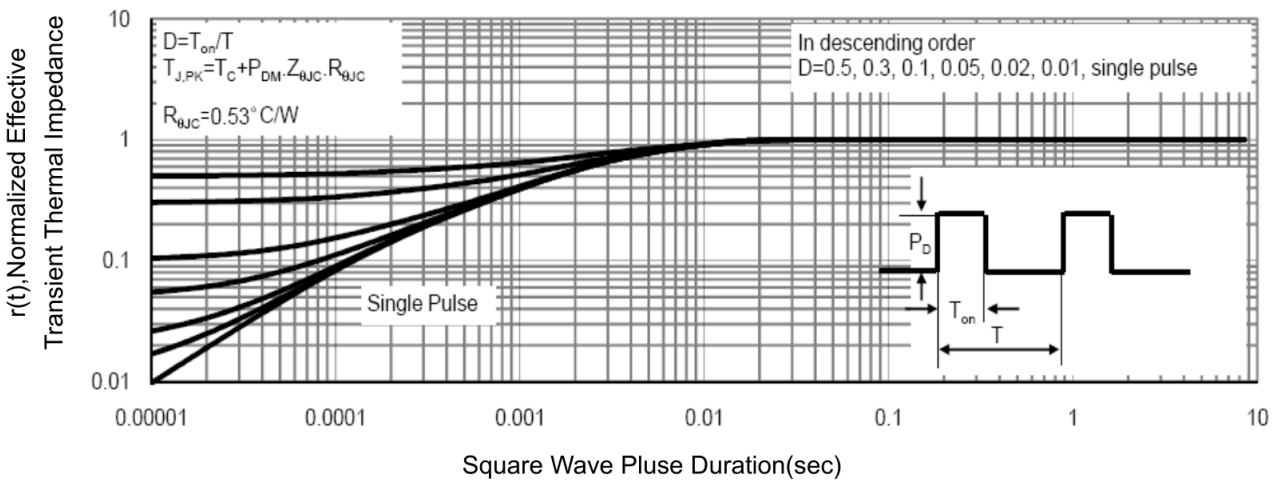
**Figure 8 Safe Operation Area**



**Figure 9 Power De-rating**

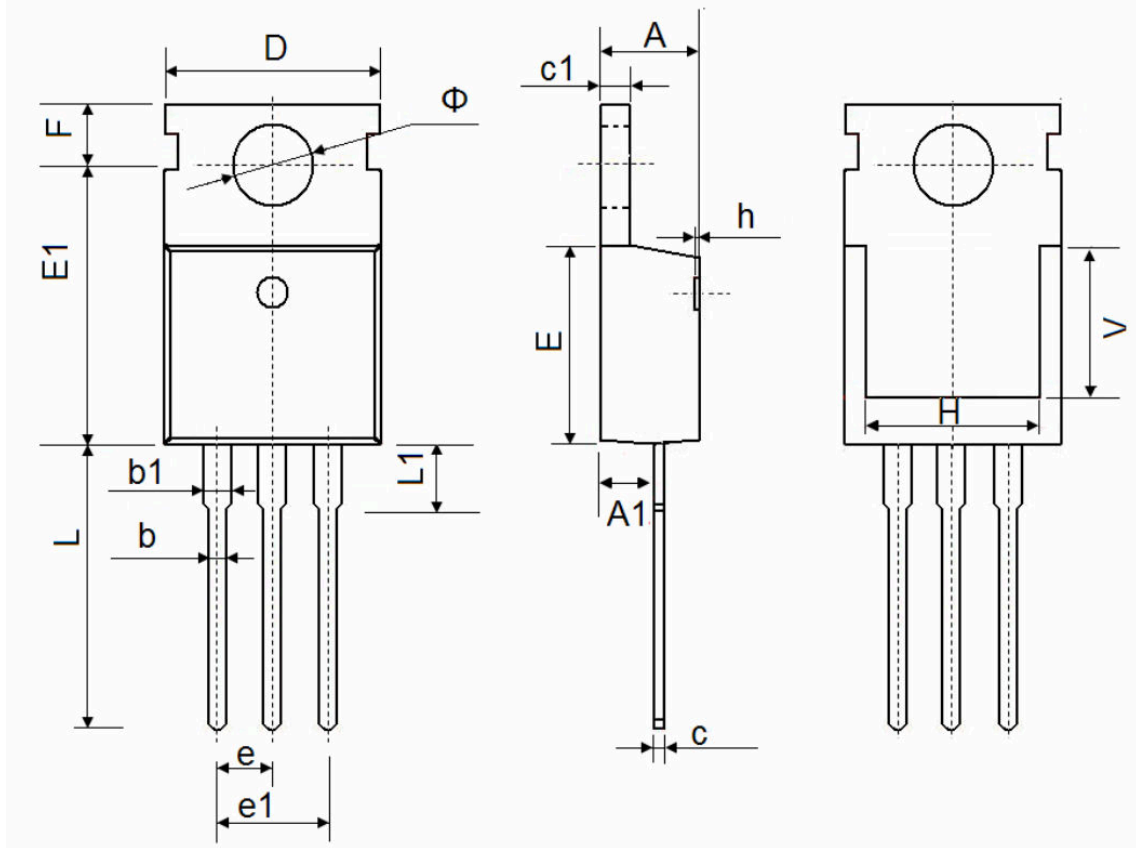


**Figure 10 ID Current- Junction Temperature**



**Figure 11 Normalized Maximum Transient Thermal Impedance**

### TO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.9500	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	7.500 REF.		0.295 REF.	
Φ	3.400	3.800	0.134	0.150