

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
100V	3.9mΩ@10V	135A

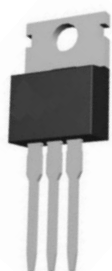
### Feature

- High density cell design for very low  $R_{DS(on)}$
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

### Application

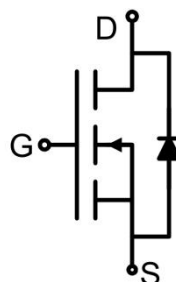
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

### Package

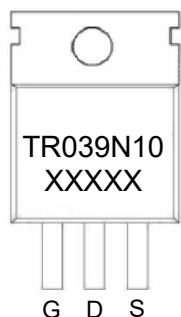


TO-220AB

### Circuit diagram



### Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	100	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	135	A
Continuous Drain Current (100°C)	I <sub>D</sub> (100°C)	108	A
Pulsed Drain Current	I <sub>DM</sub>	540	A
Power Dissipation	P <sub>D</sub>	220	W
Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	0.68	°C/W
Single pulse avalanche energy	E <sub>AS</sub>	730	mJ
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +150	°C

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

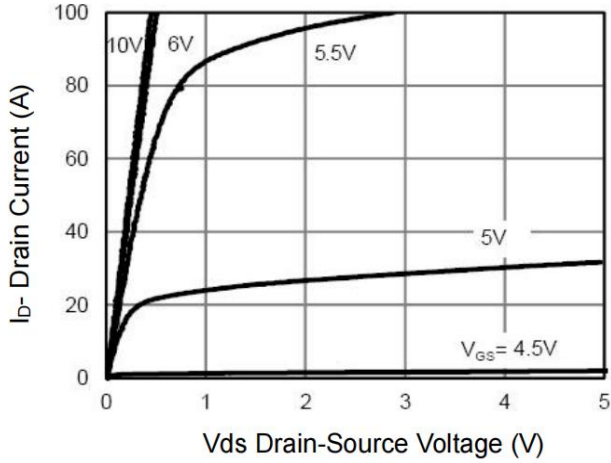
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	100			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V			1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	2.0	3.0	4.0	V
Drain-source on-resistance <sup>1)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 65A		3.65	3.9	mΩ
Forward transconductance <sup>1)</sup>	g <sub>FS</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> = 65A		90		S
<b>Dynamic characteristics<sup>2)</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V, f = 1MHz		9500		pF
Output Capacitance	C <sub>oss</sub>			650		
Reverse Transfer Capacitance	C <sub>rss</sub>			40		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 65A		125		nC
Gate-Source Charge	Q <sub>gs</sub>			40.5		
Gate-Drain Charge	Q <sub>gd</sub>			33		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = 50V, V <sub>GS</sub> = 10V I <sub>D</sub> = 65A, R <sub>GEN</sub> = 1.6Ω		20		nS
Turn-on rise time	t <sub>r</sub>			11.5		
Turn-off delay time	t <sub>d(off)</sub>			48		
Turn-off fall time	t <sub>f</sub>			10		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	I <sub>S</sub>				135	A
Diode Forward voltage	V <sub>DS</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = 65A			1.2	V
Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> = 25°C, I <sub>F</sub> = I <sub>S</sub> di/dt = 100A/μs <sup>1)</sup>		76		nS
Reverse Recovery Charge	Q <sub>rr</sub>			150		nC

Notes:

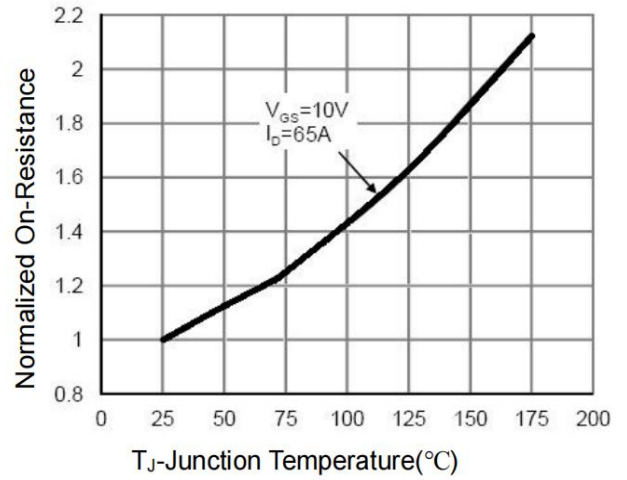
1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.

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

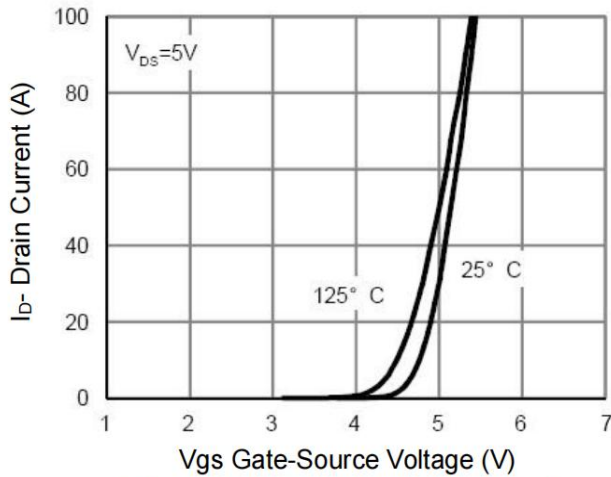
## Typical Characteristics



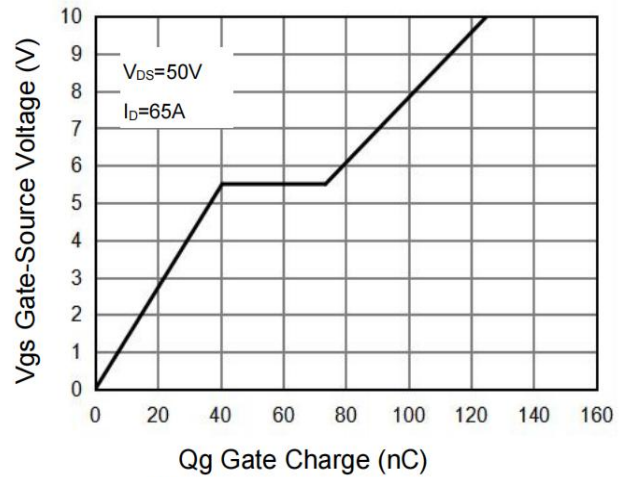
**Figure 1 Output Characteristics**



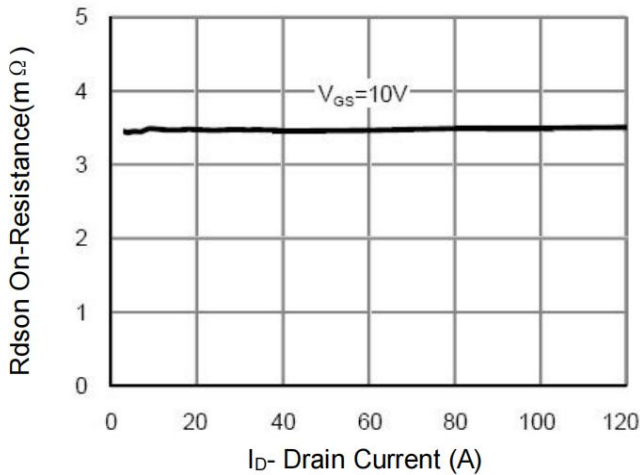
**Figure 2  $R_{ds(on)}$ -Junction Temperature**



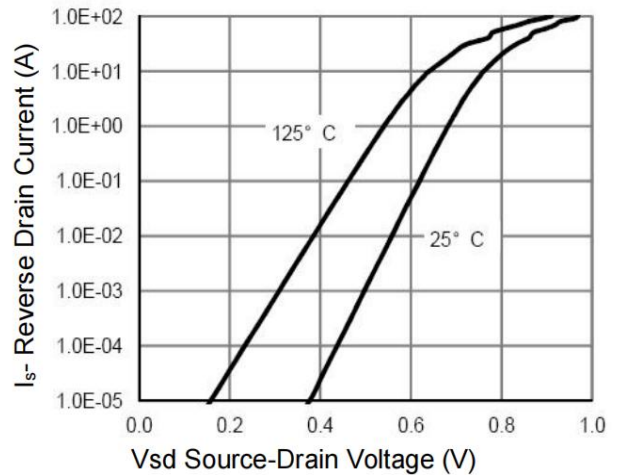
**Figure 3 Transfer Characteristics**



**Figure 4 Gate Charge**

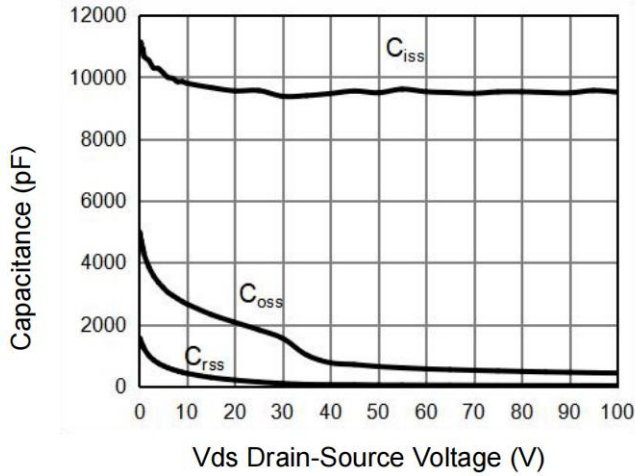


**Figure 5  $R_{ds(on)}$ - Drain Current**

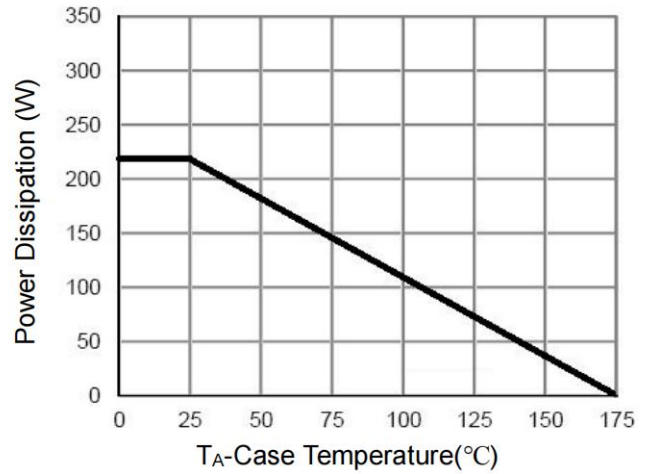


**Figure 6 Source- Drain Diode Forward**

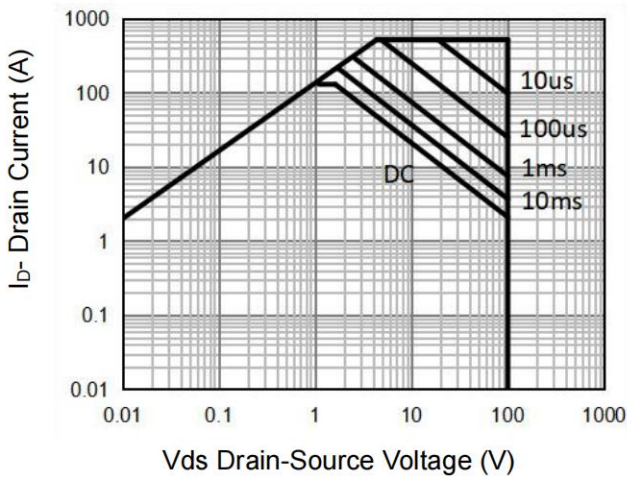
## Typical Characteristics



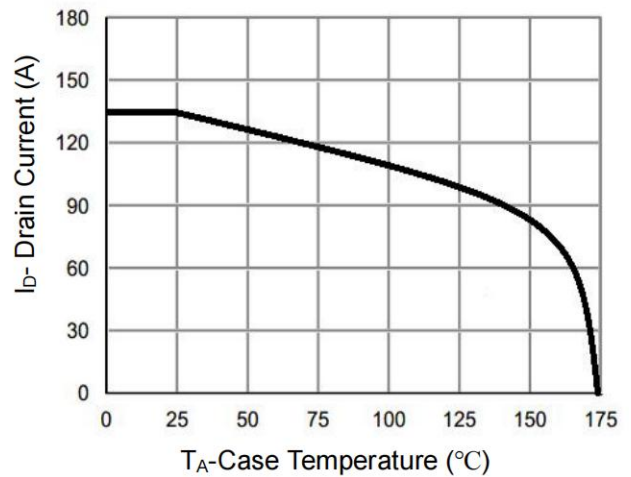
**Figure 7 Capacitance vs Vds**



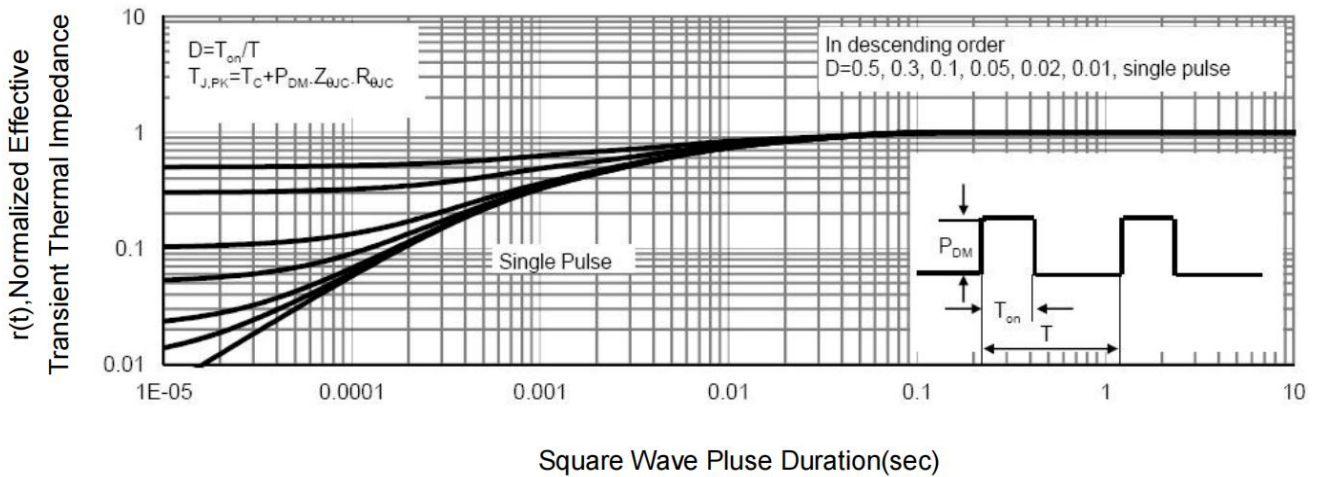
**Figure 8 Power De-rating**



**Figure 9 Safe Operation Area**

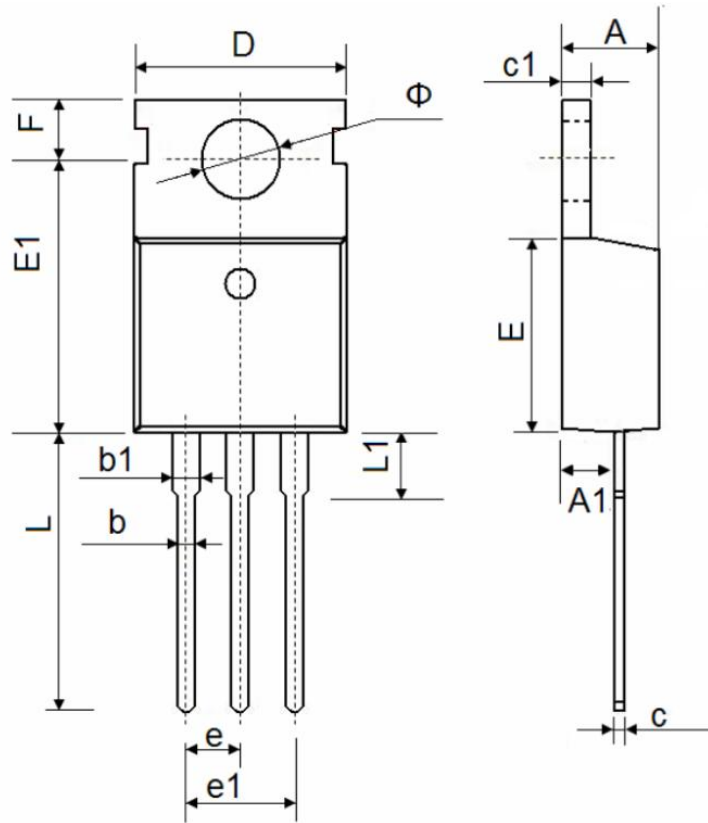


**Figure 10 Current De-rating**



**Figure 11 Normalized Maximum Transient Thermal Impedance**

### TO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.200	4.700	0.165	0.185
A1	2.250	2.550	0.089	0.100
b	0.700	0.910	0.028	0.036
b1	1.170	1.450	0.046	0.057
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.700	10.250	0.382	0.404
E	8.950	9.750	0.352	0.383
E1	12.550	13.100	0.494	0.516
e	2.540 TYP.		0.110 TYP.	
e1	5.080 BSC.		0.200 BSC.	
L	12.750	13.500	0.502	0.531
L1	2.750	3.350	0.108	0.132
F	2.650	2.950	0.104	0.116
Φ	3.400	3.800	0.134	0.150