

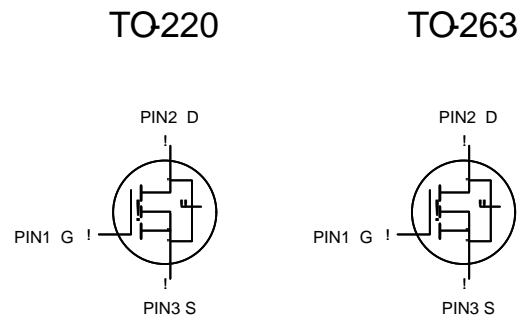


## Features

- 60V/180A  
 $R_{DS(ON)} = 3.5\text{ m}\Omega$  (typ.) @  $V_{GS}=10\text{V}$
- 100% avalanche tested
- Reliable and Rugged
- Lead Free and Green Devices Available  
 (RoHS Compliant)

## Applications

- Switching application
- Power Management for Inverter Systems.



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
<b>Common Ratings</b> ( $T_C=25^\circ\text{C}$ Unless Otherwise Noted)			
$V_{DSS}$	Drain-Source Voltage	60	V
$V_{GSS}$	Gate-Source Voltage	$\pm 25$	
$T_J$	Maximum Junction Temperature	175	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 180	A
<b>Mounted on Large Heat Sink</b>			
$I_{DM}$	Pulsed Drain Current *	$T_C=25^\circ\text{C}$ 583**	A
$I_D$	Continuous Drain Current	$T_C=25^\circ\text{C}$ 180	A
		$T_C=100^\circ\text{C}$ 115	
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 214	W
		$T_C=100^\circ\text{C}$ 107	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.7	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	62.5	
<b>Avalanche Ratings</b>			
$E_{AS}$	Avalanche Energy, Single Pulsed	$L=0.5\text{mH}$ 1000***	mJ

Note j \* Repetitive rating ; pulse width limited by junction temperature

\*\* Drain current is limited by junction temperature

\*\*\*  $V_D=48\text{V}$

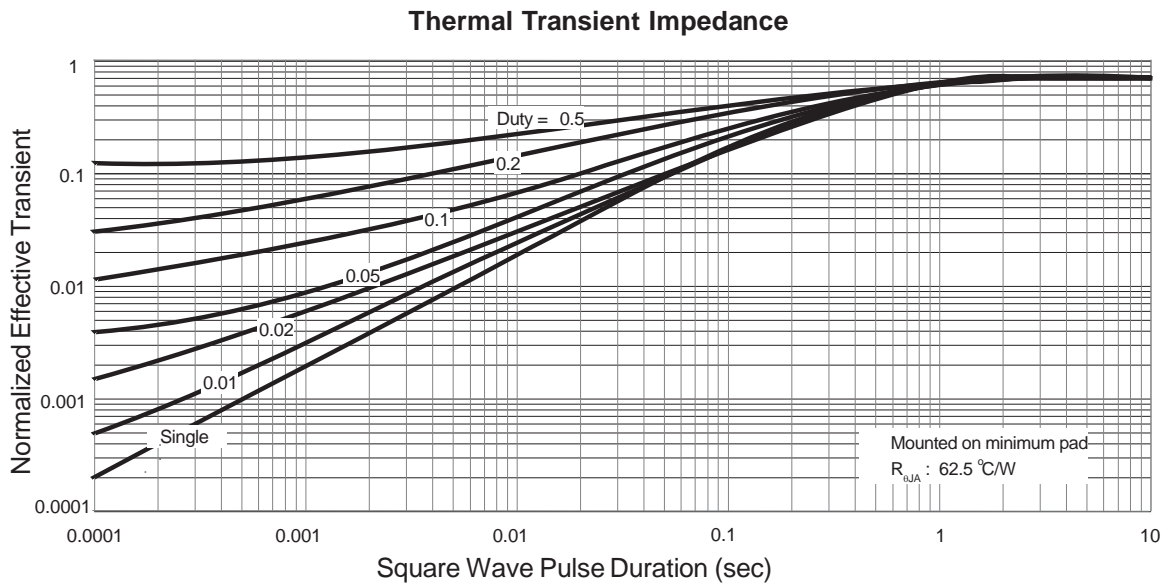
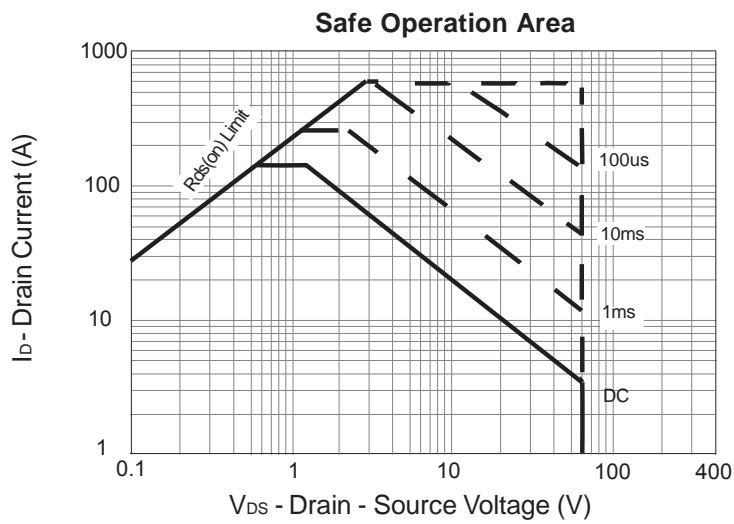
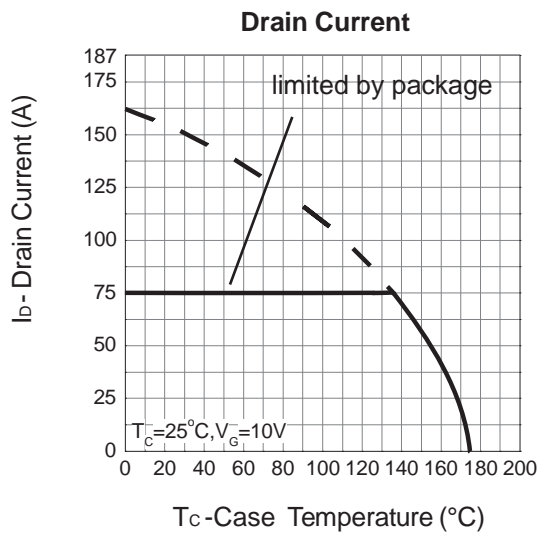
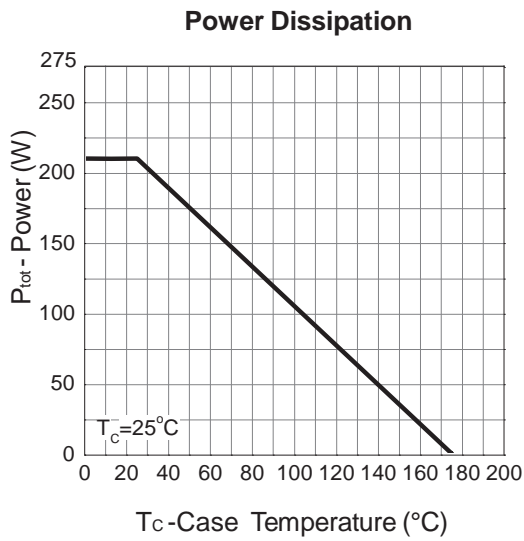
**Electrical Characteristics** ( $T_C = 25^\circ\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	TW180N06C			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	60	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V$	-	-	1	$\mu A$
		$T_J=85^\circ C$	-	-	10	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1.0	1.6	3.0	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 25V, V_{DS}=0V$	-	-	$\pm 100$	nA
$R_{DS(ON)}^*$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=81A$	-	3.5	4.5	$m\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^*$	Diode Forward Voltage	$I_{SD}=81A, V_{GS}=0V$	-	0.8	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=81A, di_{SD}/dt=100A/\mu s$	-	30	-	ns
$Q_{rr}$	Reverse Recovery Charge		-	52	-	nC

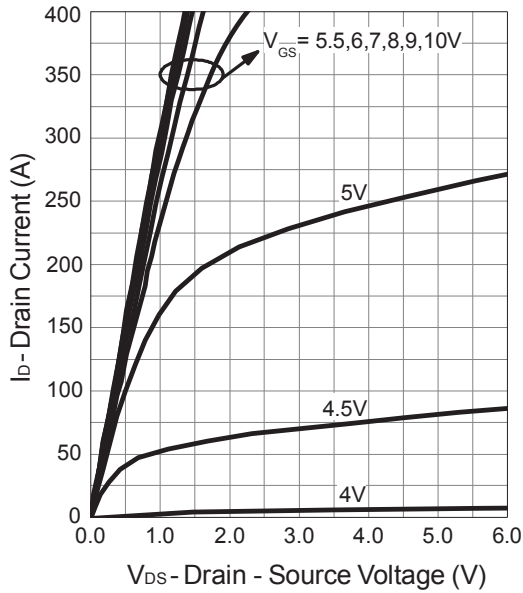
**Electrical Characteristics (Cont.)** ( $T_C = 25^\circ\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	TW180N06C			Unit
			Min.	Typ.	Max.	
<b>Dynamic Characteristics</b>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$	-	0.7	-	$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=25V,$ Frequency=1.0MHz	-	4376	-	pF
$C_{oss}$	Output Capacitance		-	857	-	
$C_{rss}$	Reverse Transfer Capacitance		-	334	-	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=30V, R_G=6\Omega,$ $I_{DS}=81A, V_{GS}=10V,$	-	28	-	ns
$T_r$	Turn-on Rise Time		-	18	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	42	-	
$T_f$	Turn-off Fall Time		-	54	-	
<b>Gate Charge Characteristics</b>						
$Q_g$	Total Gate Charge	$V_{DS}=48V, V_{GS}=10V,$ $I_{DS}=81A$	-	130	-	nC
$Q_{gs}$	Gate-Source Charge		-	24	-	
$Q_{gd}$	Gate-Drain Charge		-	47	-	

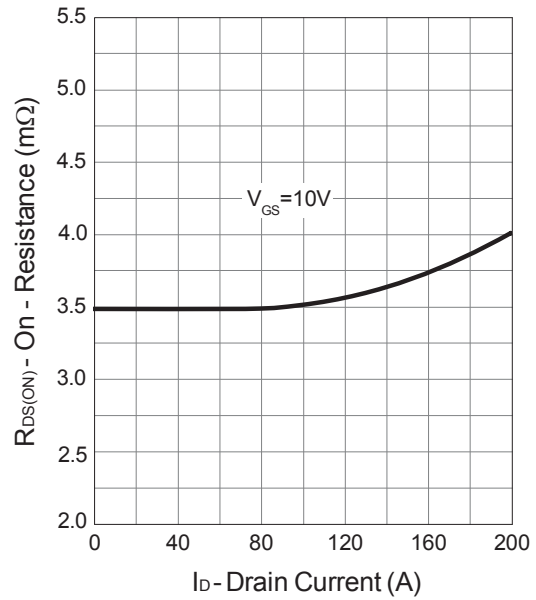
Note \* : Pulse test ; pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .



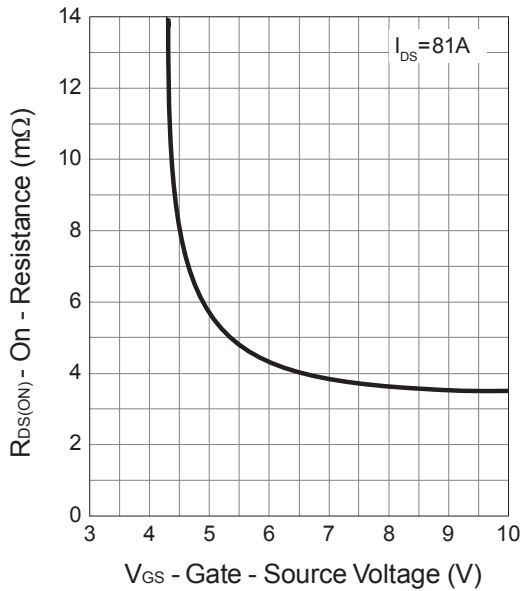
**Output Characteristics**



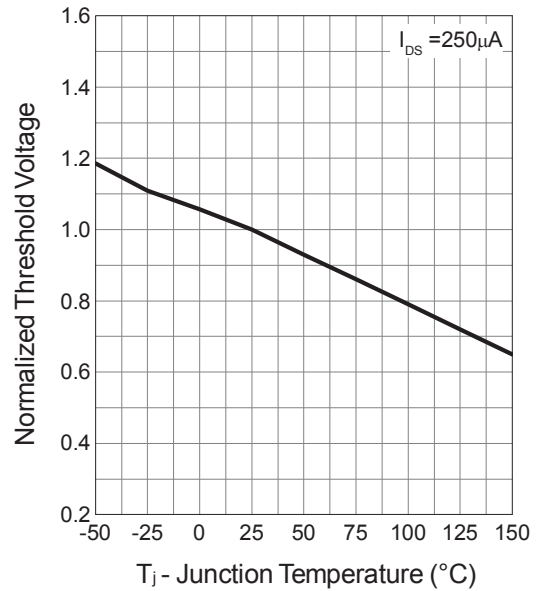
**Drain-Source On Resistance**



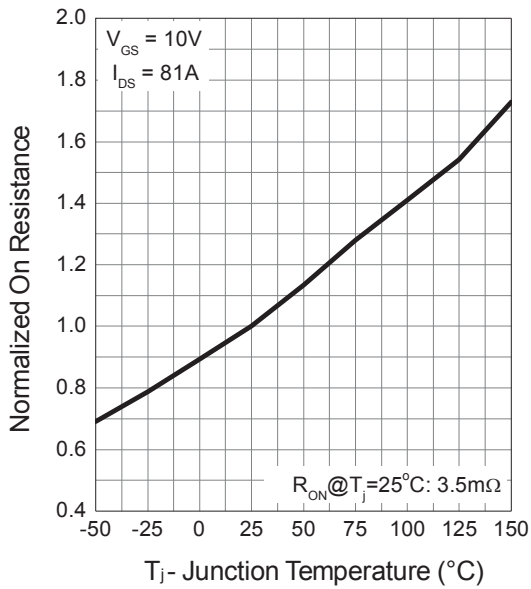
**Gate-Source On Resistance**



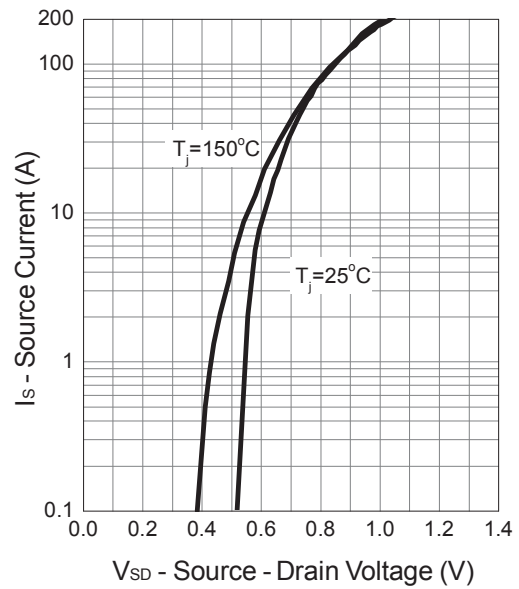
**Gate Threshold Voltage**



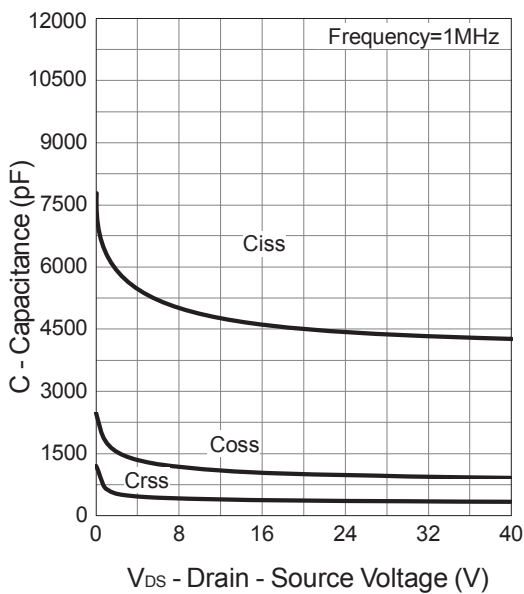
**Drain-Source On Resistance**



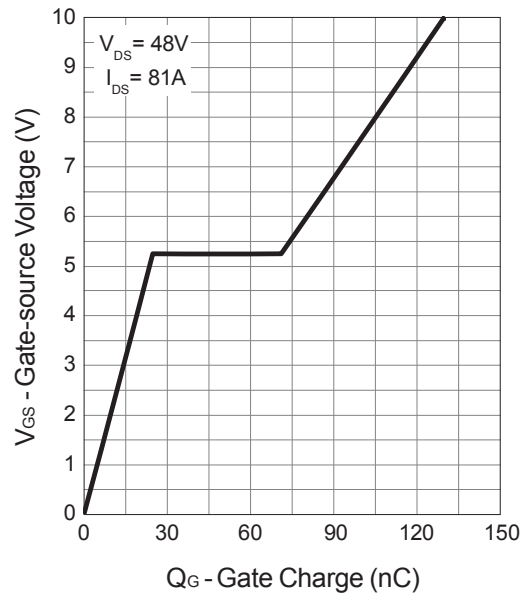
**Source-Drain Diode Forward**

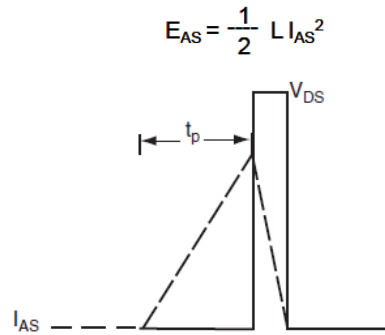
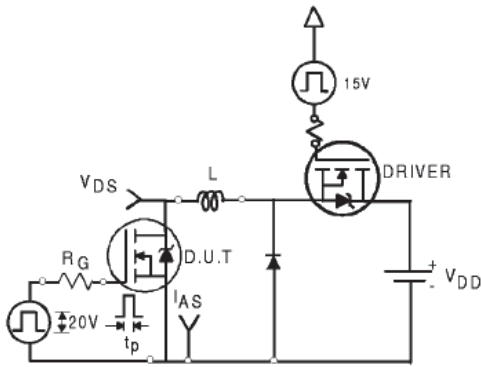


**Capacitance**

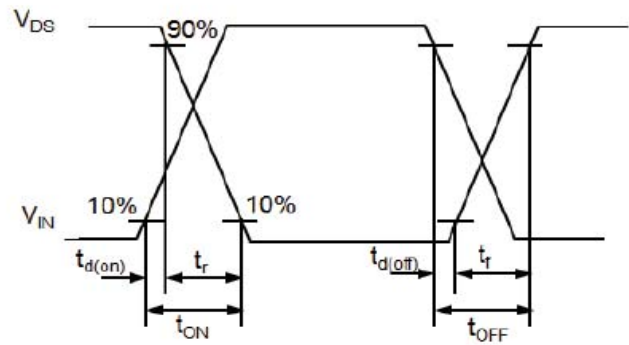
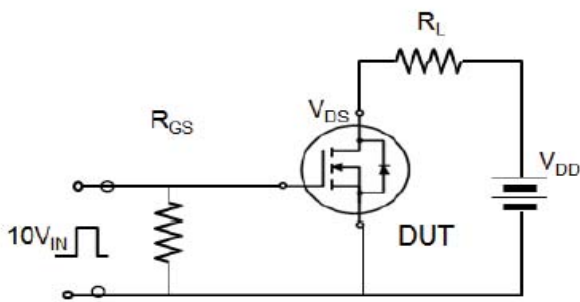


**Gate Charge**





### Switching Time Test Circuit



### Gate Charge Test Circuit

