

General Description

The WSR70P10 is the highest performance trench P-Ch MOSFET with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the small power switching and load switch applications.

The WSR70P10 meet the RoHS and Green Product requirement with full function reliability approved.

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent $C_{dv/dt}$ effect decline
- Green Device Available

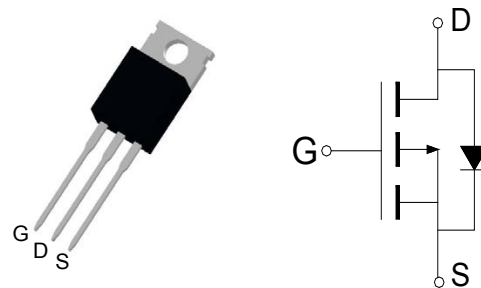
Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D
-100V	18m Ω	-70A

Applications

- Inverters

TO-220AB Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
Common Ratings ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)			
V_{DSS}	Drain-Source Voltage	-100	V
V_{GSS}	Gate-Source Voltage	± 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	$T_C=25^\circ\text{C}$ -70	A
Mounted on Large Heat Sink			
$I_{DP}^{(1)}$	300 μs Pulse Drain Current Tested	$T_C=25^\circ\text{C}$ -240	A
$I_D^{(2)}$	Continuous Drain Current ($V_{GS}=-10\text{V}$)	$T_C=25^\circ\text{C}$ -70	A
		$T_C=100^\circ\text{C}$ -45	
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 190	W
		$T_C=100^\circ\text{C}$ 95	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.8	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	62.5	$^\circ\text{C/W}$
Drain-Source Avalanche Ratings			
$E_{AS}^{(3)}$	Avalanche Energy, Single Pulsed	400	mJ

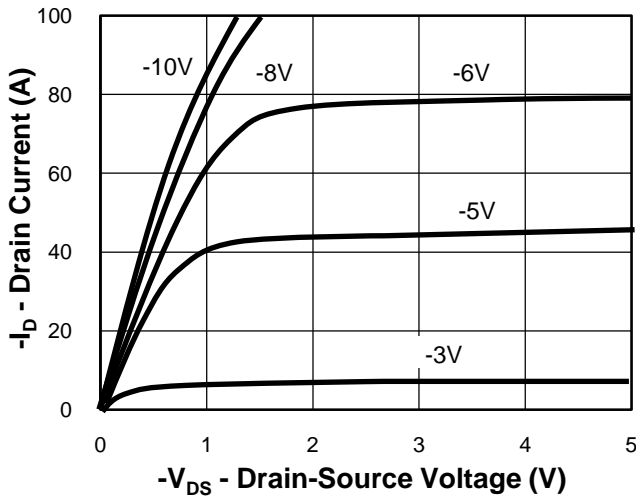
Electrical Characteristics ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=-250\mu A$	-100			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-100V, V_{GS}=0V$			-1	μA
		$T_J=125^\circ C$			-30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	-2		-4	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 25V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}^{④}$	Drain-Source On-state Resistance	$V_{GS}=-10V, I_{DS}=-60A$		18	25	m Ω
Diode Characteristics						
$V_{SD}^{④}$	Diode Forward Voltage	$I_{SD}=-30A, V_{GS}=0V$			-1.5	V
t_{rr}	Reverse Recovery Time	$I_{SD}=-60A, dI_{SD}/dt=100A/\mu s$		175		ns
Q_{rr}	Reverse Recovery Charge			620		nC
Dynamic Characteristics ^⑤						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$		2		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=-50V,$ Frequency=1.0MHz		4200		pF
C_{oss}	Output Capacitance			615		
C_{rss}	Reverse Transfer Capacitance			380		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-50V, I_{DS}=-60A,$ $V_{GEN}=-10V, R_G=6\Omega$		27		ns
t_r	Turn-on Rise Time			83		
$t_{d(OFF)}$	Turn-off Delay Time			145		
t_f	Turn-off Fall Time			40		
Gate Charge Characteristics ^⑤						
Q_g	Total Gate Charge	$V_{DS}=-80V, V_{GS}=-10V,$ $I_{DS}=-60A$		164		nC
Q_{gs}	Gate-Source Charge			34		
Q_{gd}	Gate-Drain Charge			50		

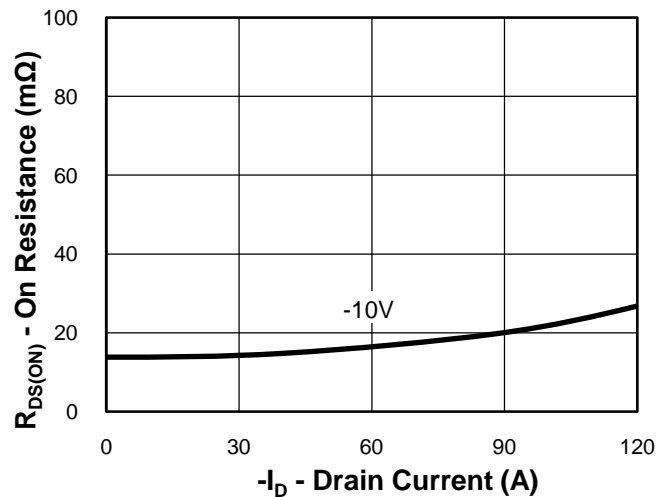
- Notes:
- ① Pulse width limited by safe operating area.
 - ② Calculated continuous current based on maximum allowable junction temperature.
 - ③ Limited by T_{Jmax} , $I_{AS}=-40A$, $V_{DD}=-60V$, $R_G=50\Omega$, Starting $T_J=25^\circ C$.
 - ④ Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 - ⑤ Guaranteed by design, not subject to production testing.

Typical Characteristics

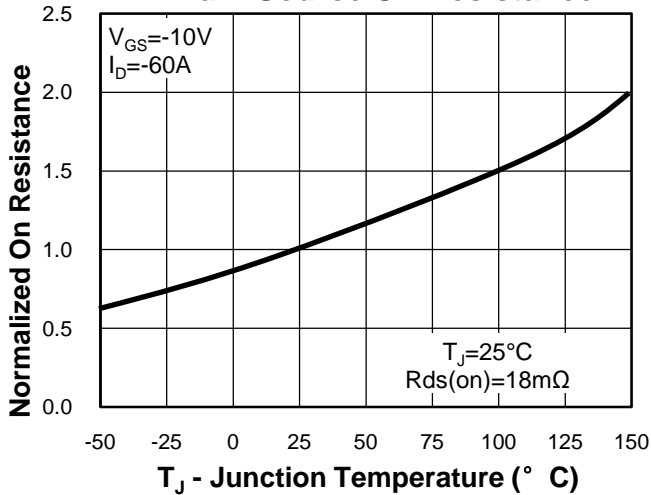
Output Characteristics



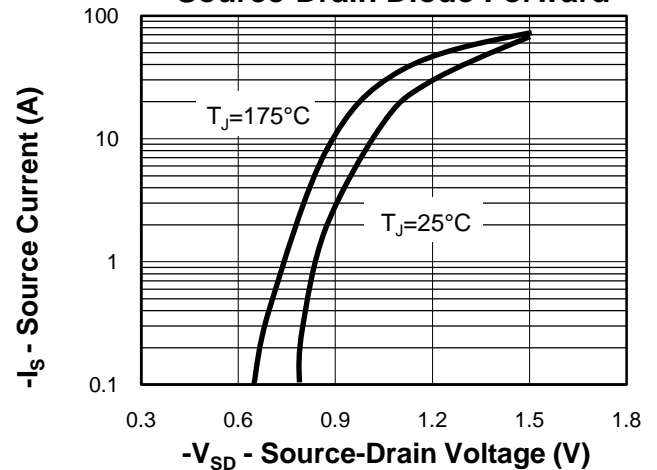
Drain-Source On Resistance



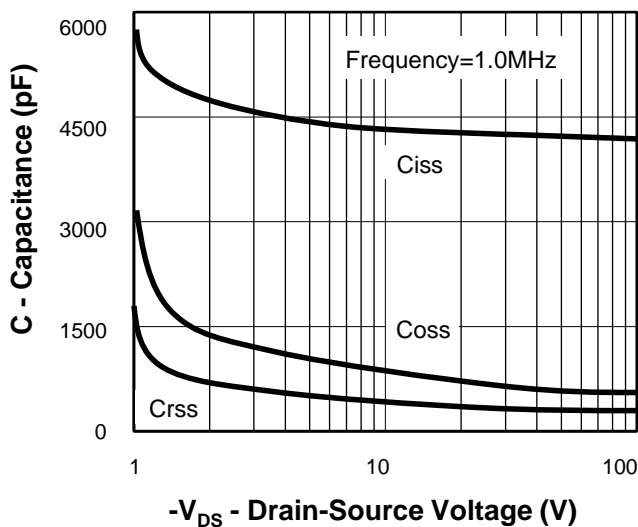
Drain-Source On Resistance



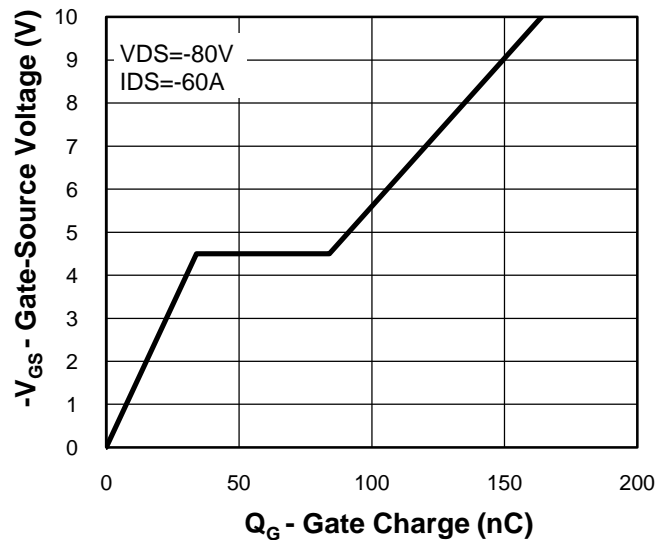
Source-Drain Diode Forward



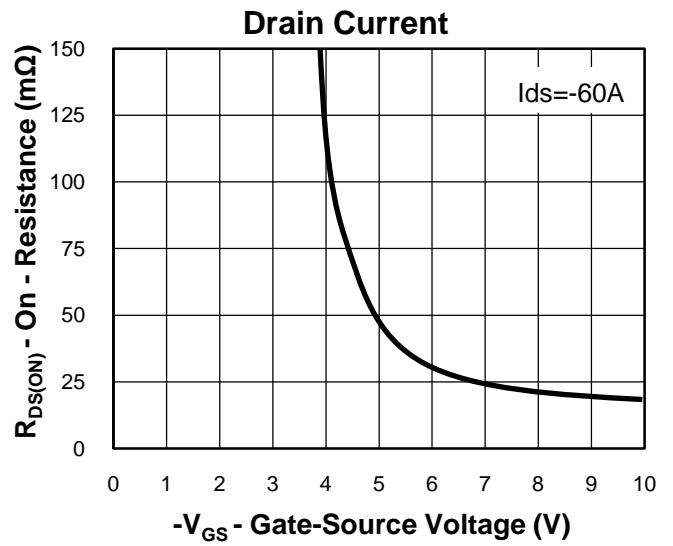
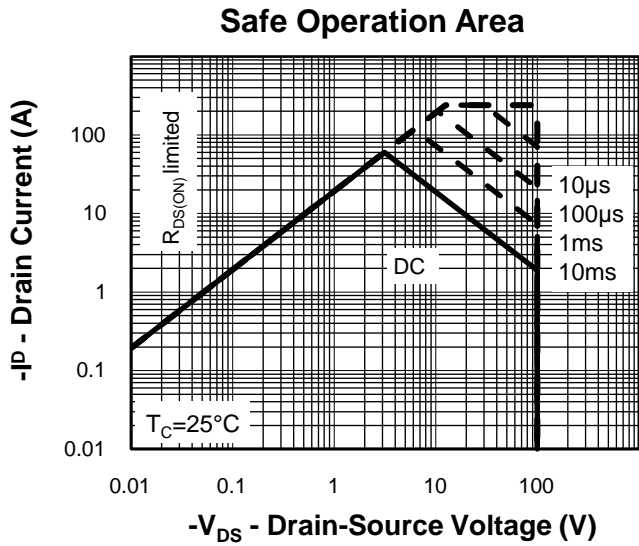
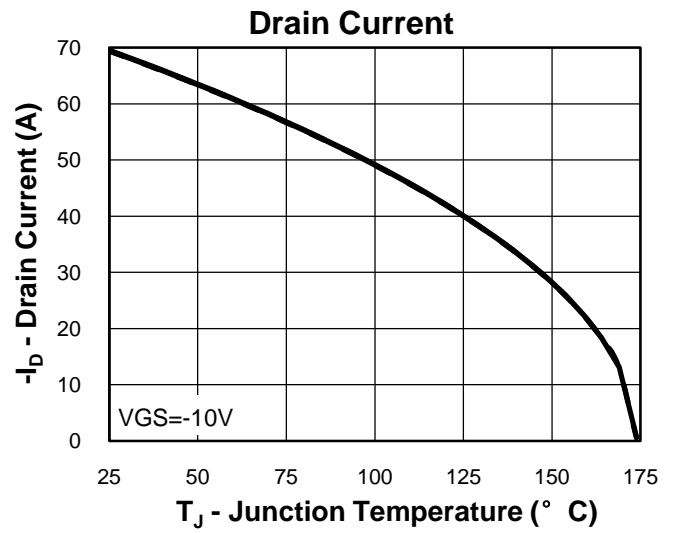
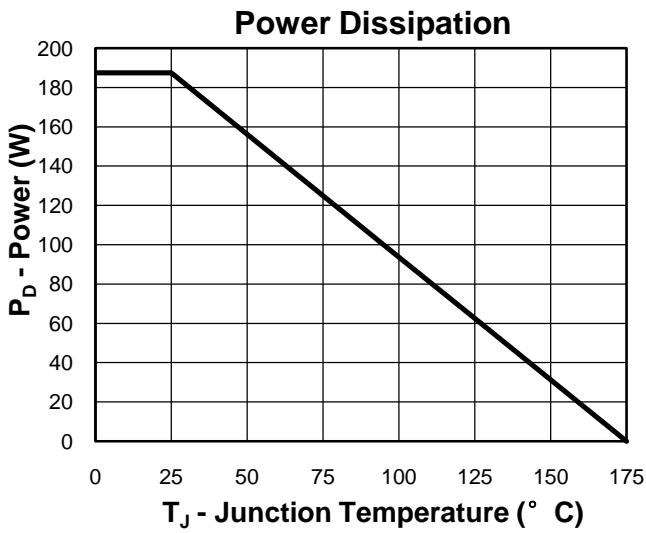
Capacitance



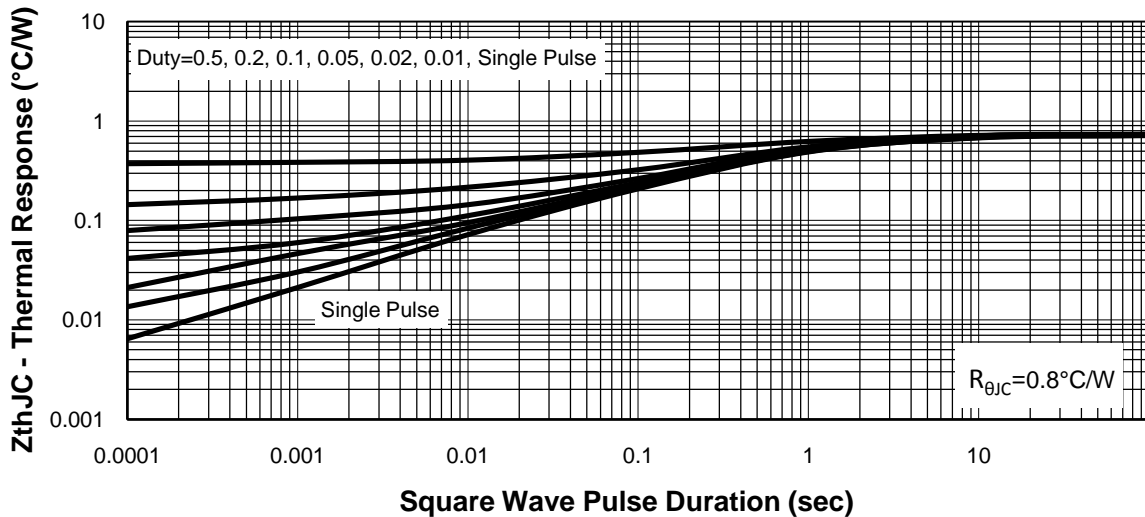
Gate Charge



Typical Characteristics



Thermal Transient Impedance





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