

General Description

The WSR45P10 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 WSR45P10 meet the RoHS and Green Product requirement with full function reliability approved.

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent Cdv/dt effect decline
- Green Device Available

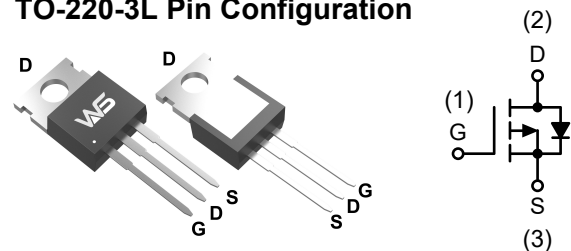
Product Summary

BV_{DSS}	$R_{DS(on)}$	I_D
-100V	44mΩ	-40A

Applications

- Inverters

TO-220-3L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _C =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		-100	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		175	°C
T _{STG}	Storage Temperature Range		-55 to 175	°C
I _S	Diode Continuous Forward Current	T _C =25°C	-40	A
Mounted on Large Heat Sink				
I _{DM}	Pulsed Drain Current *		-120**	A
I _D	Continuous Drain Current	T _C =25°C	-40	A
		T _C =100°C	-26	
P _D	Maximum Power Dissipation	T _C =25°C	136	W
		T _C =100°C	68	
R _{θJC}	Thermal Resistance-Junction to Case		1.1	°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient		62.5	
Avalanche Ratings				
E _{AS}	Avalanche Energy, Single Pulsed	L=0.5mH	308***	mJ

Note : * Repetitive rating ; pulse width limited by junction temperatur

** Drain current is limited by junction temperature

*** $V_D=-80\text{V}$

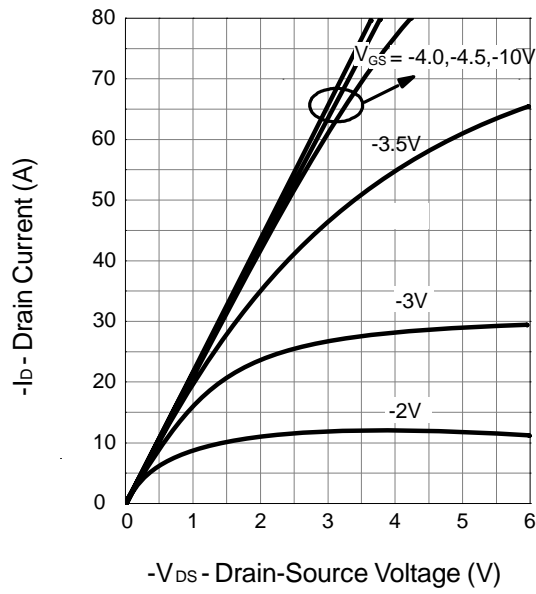
Electrical Characteristics ($T_C=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =-250μA	-100	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-100 V, V _{GS} =0V	-	-	-1	μA
		T _J =85°C	-	-	-10	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-1	-2	-3	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} *	Drain-Source On-state Resistance	V _{GS} =-10V, I _{DS} =-20A	-	44	55	mΩ
R _{DS(ON)} *	Drain-Source On-state Resistance	V _{GS} =-4.5V, I _{DS} =-20A	-	47	58.5	mΩ
Diode Characteristics						
V _{SD} *	Diode Forward Voltage	I _{SD} =-20A, V _{GS} =0V	-	-0.8	-1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =-20A, dI _{SD} /dt=-100A/μ s	-	70	-	ns
Q _{rr}	Reverse Recovery Charge		-	90	-	nC
Dynamic Characteristics						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	2	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-20V, Frequency=1.0MHz	-	5720	-	pF
C _{oss}	Output Capacitance		-	790	-	
C _{rss}	Reverse Transfer Capacitance		-	450	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-50V, R _G = 6 Ω, I _{DS} =-20A, V _{GS} =-10V,	-	30	-	ns
T _r	Turn-on Rise Time		-	79	-	
t _{d(OFF)}	Turn-off Delay Time		-	69	-	
T _f	Turn-off Fall Time		-	82	-	
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DS} =-80V, V _{GS} =-10V, I _{DS} =-20A	-	125	-	nC
Q _{gs}	Gate-Source Charge		-	21	-	
Q _{gd}	Gate-Drain Charge		-	45	-	

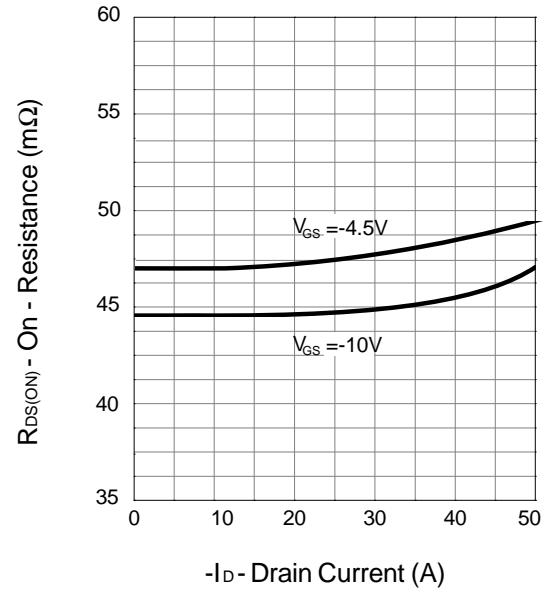
Note * : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Typical Characteristics

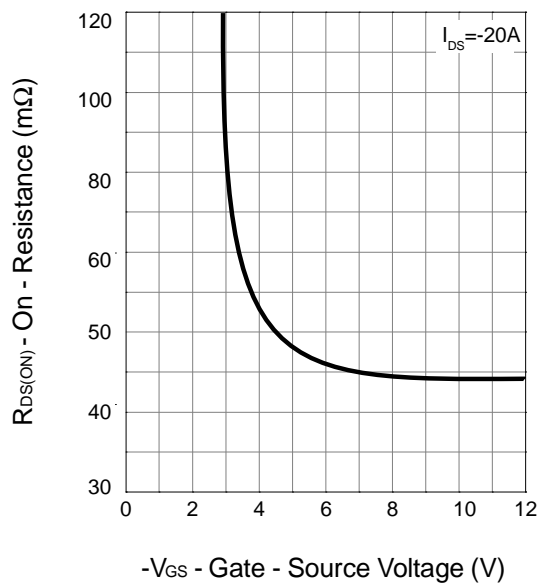
Output Characteristics



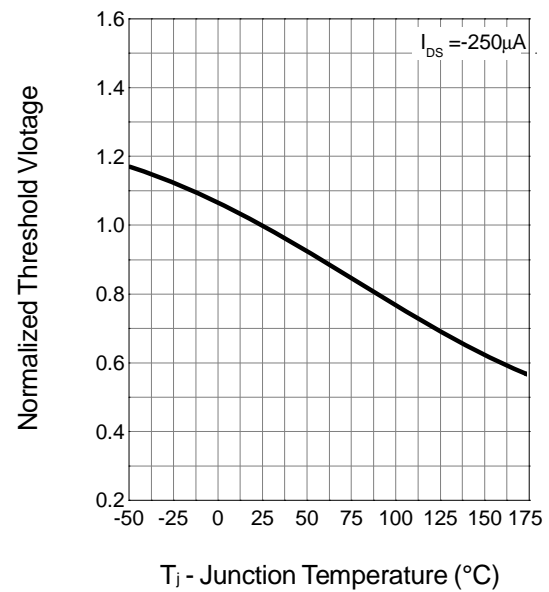
Drain-Source On Resistance



Drain-Source On Resistance

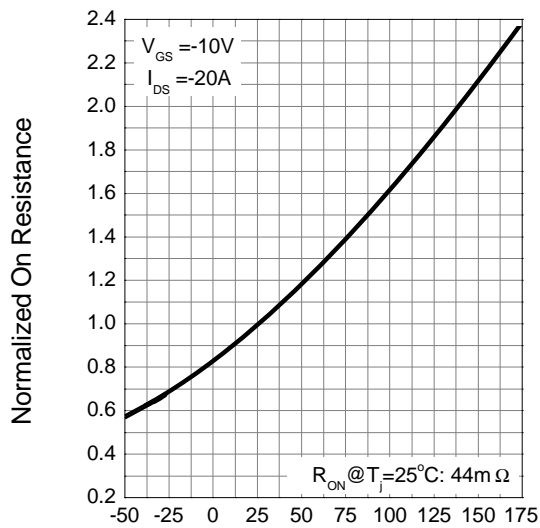


Gate Threshold Voltage



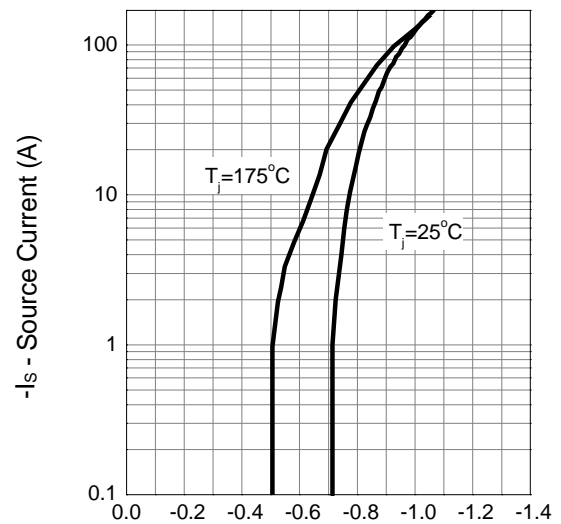
Typical Characteristics

Drain-Source On Resistance



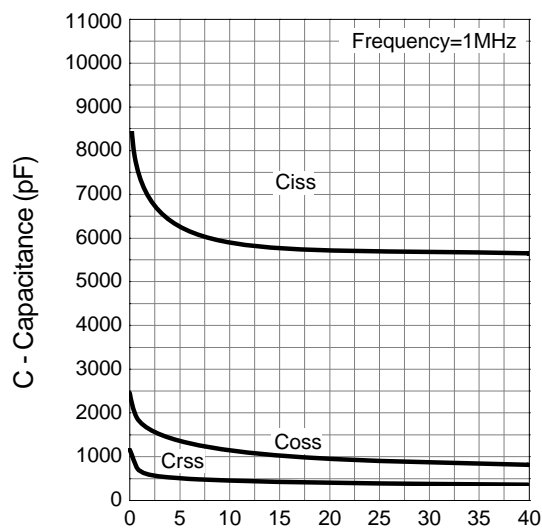
T_j - Junction Temperature ($^{\circ}\text{C}$)

Source-Drain Diode Forward



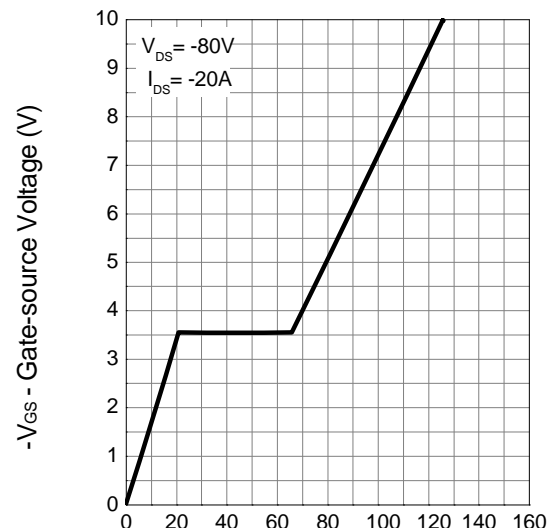
$-V_{SD}$ - Source-Drain Voltage (V)

Capacitance



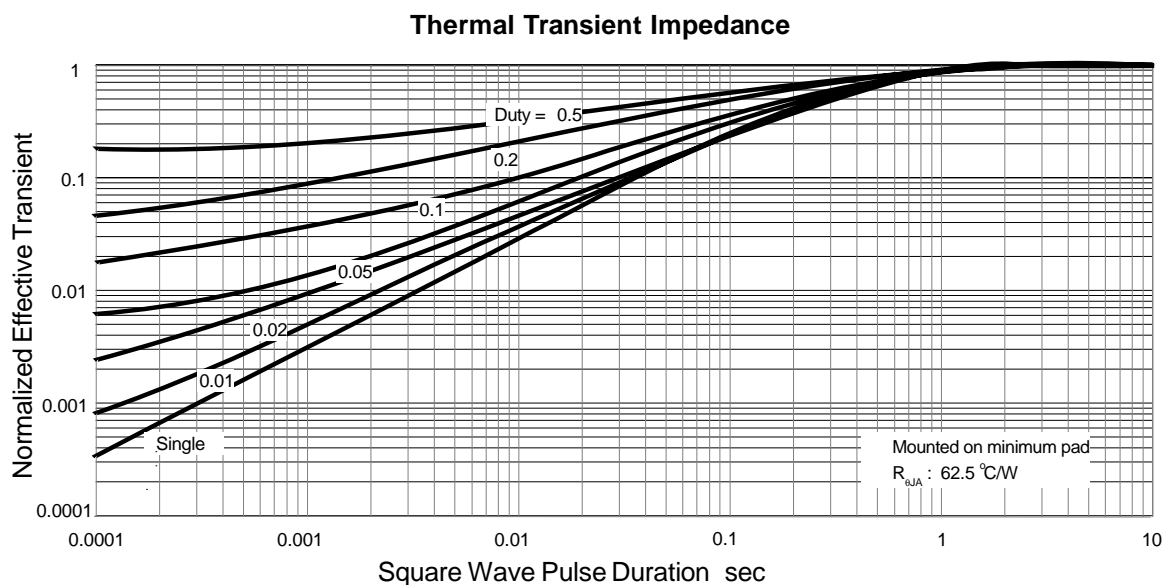
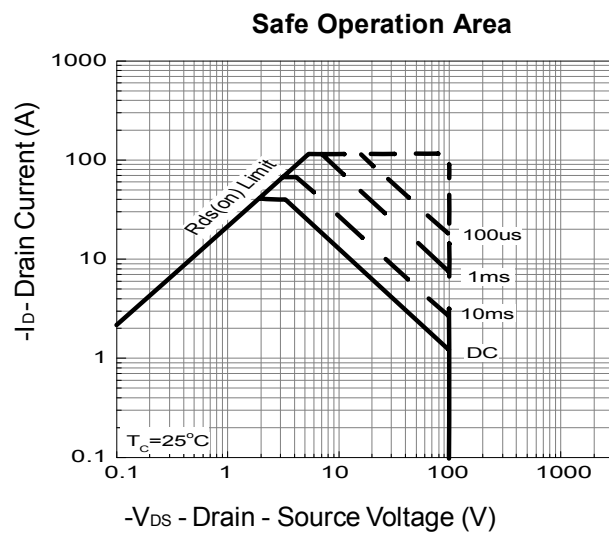
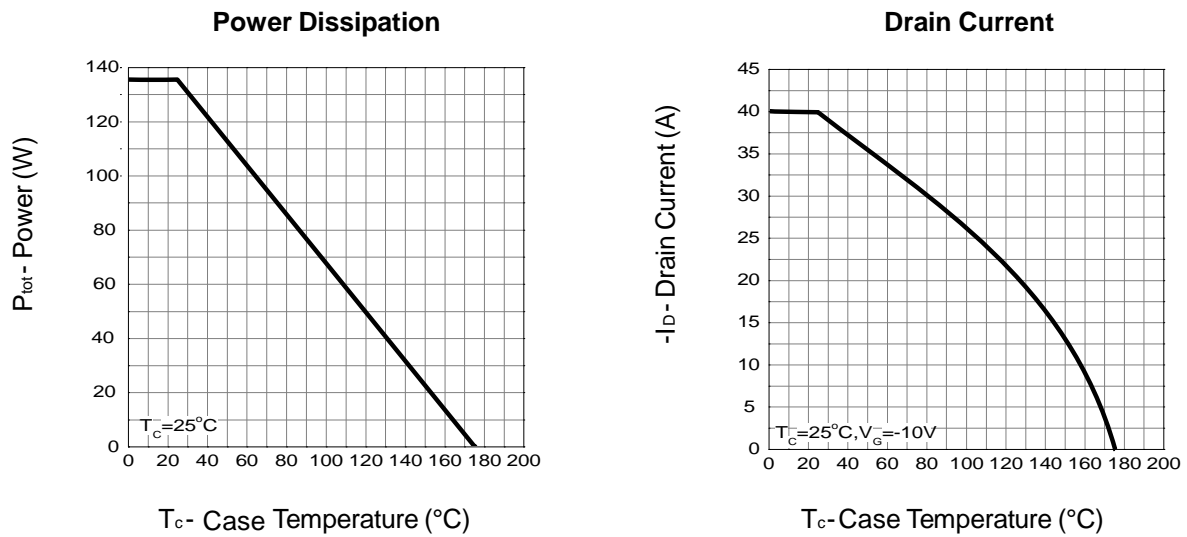
$-V_{DS}$ - Drain - Source Voltage (V)

Gate Charge

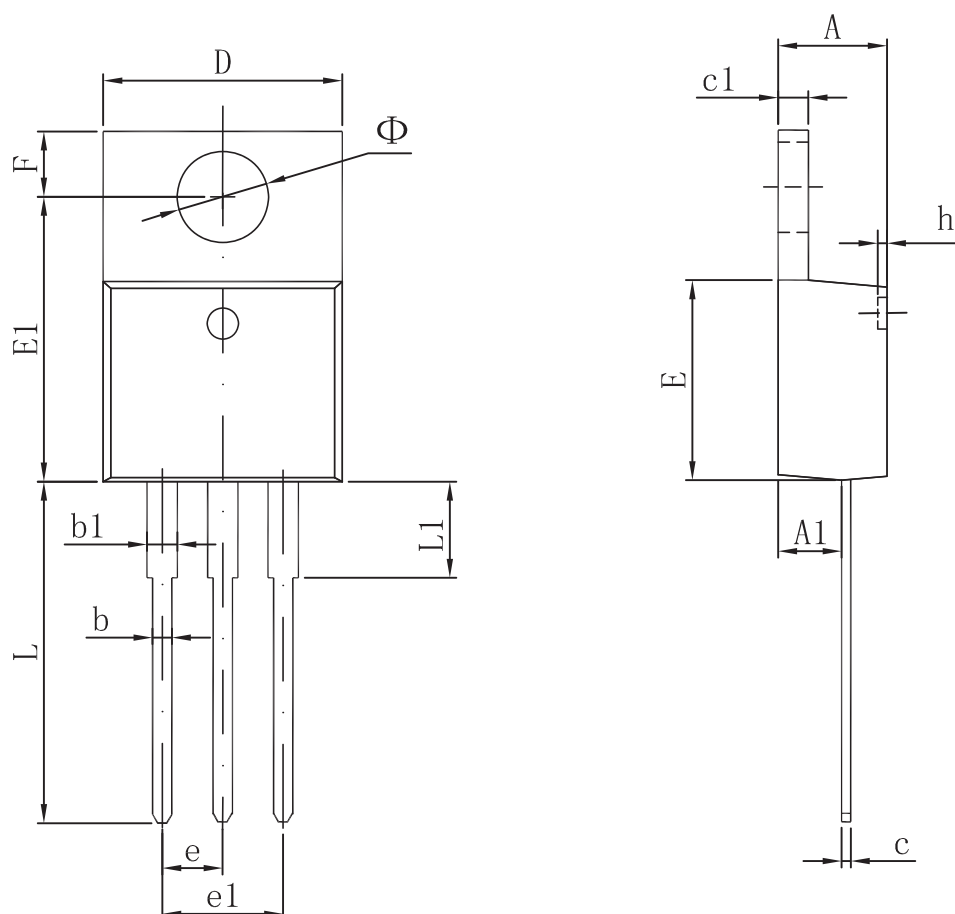


Q_G - Gate Charge (nC)

Typical Characteristics



Packaging information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.470	4.670	0.176	0.184
A1	2.520	2.820	0.099	0.111
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
E1	12.060	12.460	0.475	0.491
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
h	0.000	0.300	0.000	0.012
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
Φ	3.735	3.935	0.147	0.155

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