General Description

The 45P10 is the highest performance trench P-Ch MOSFET with extreme high cell density , which provide excellent R_{DSON} and gate charge for most of the small power switching and load switch applications.

The 45P10 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

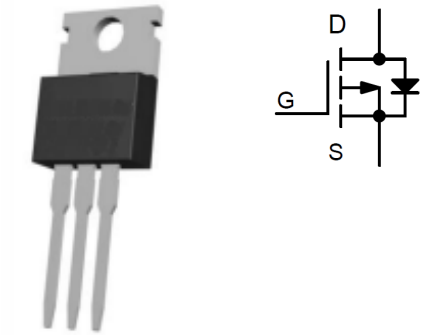
Product Summery

BV_{DSS}	R_{DSON}	I_D
-100V	44mΩ	-40A

Applications

- Inverters

TO-220AB 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	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		1.1	°C/W
$R_{\theta JA}$	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 limiited by junction temperatur

** Drain current is limited by junction temperature

*** VD=-80V

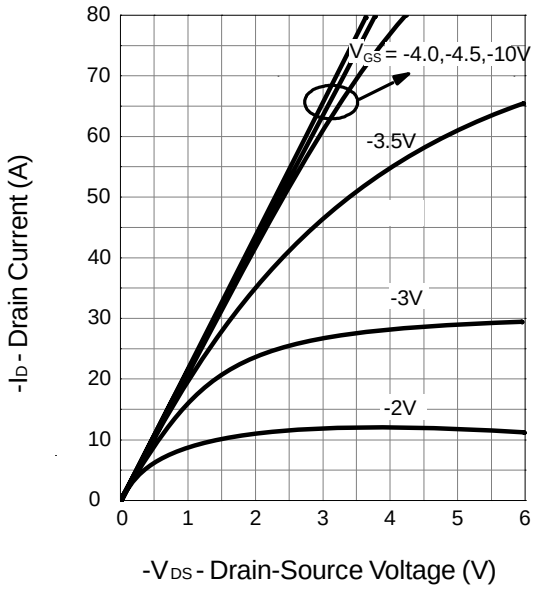
Electrical Characteristics (T_C=25°C Unless Otherwise Noted)

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/μs	-	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		-	82	-	
T_f	Turn-off Fall Time		-	69	-	
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	-	

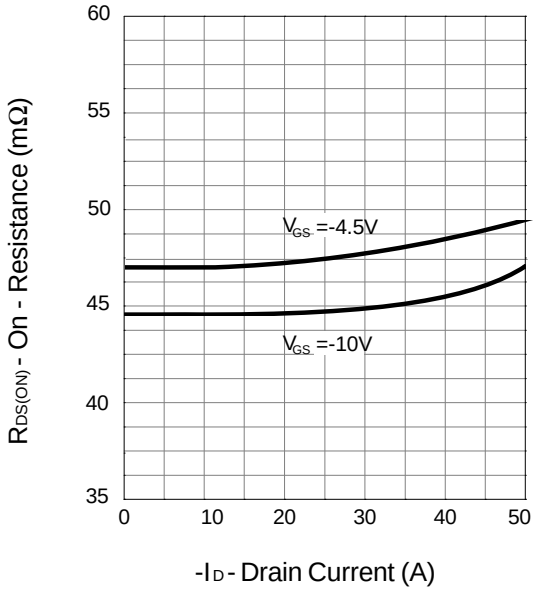
Note * : Pulse test ; pulse width ≤300μs, duty cycle≤2%.

Typical Characteristics

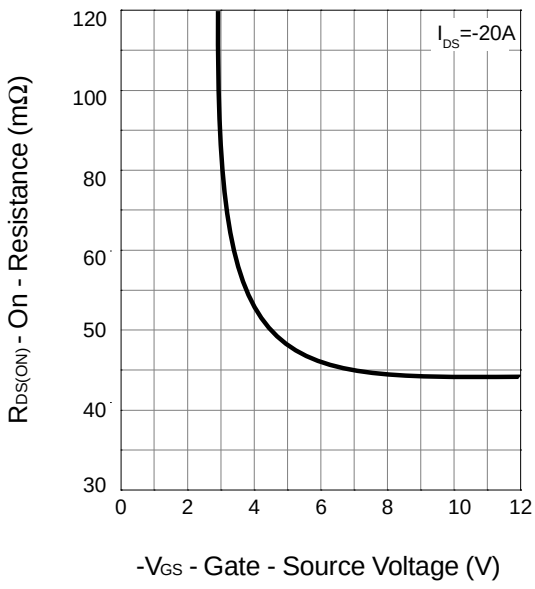
Output Characteristics



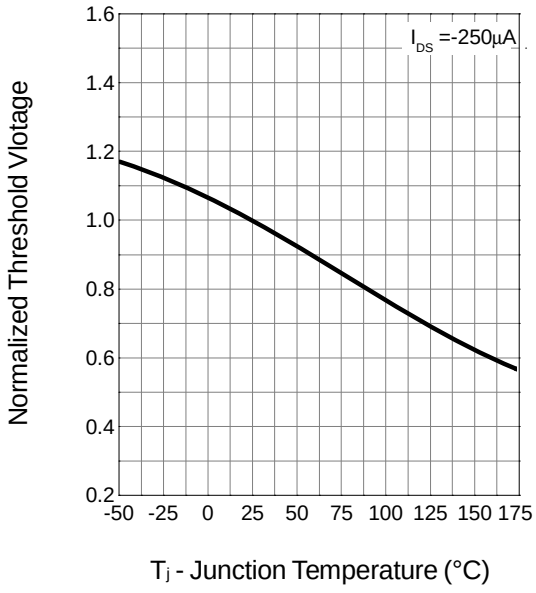
Drain-Source On Resistance



Drain-Source On Resistance

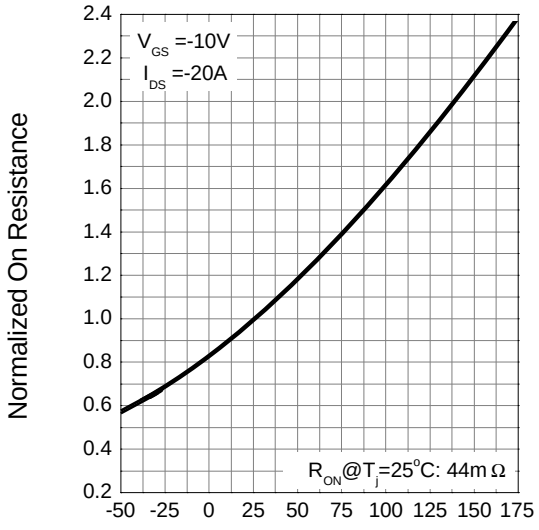


Gate Threshold Voltage

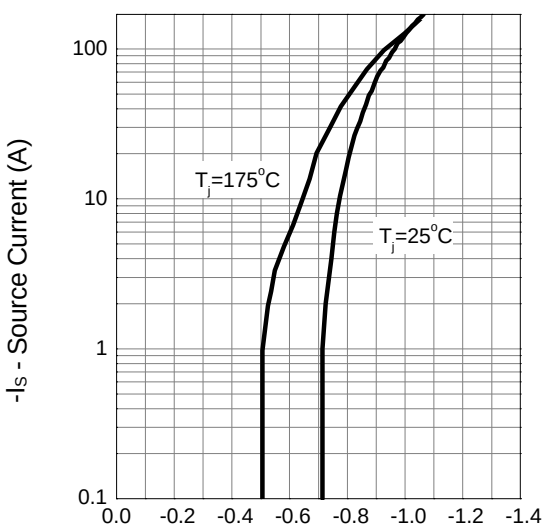


Typical Characteristics

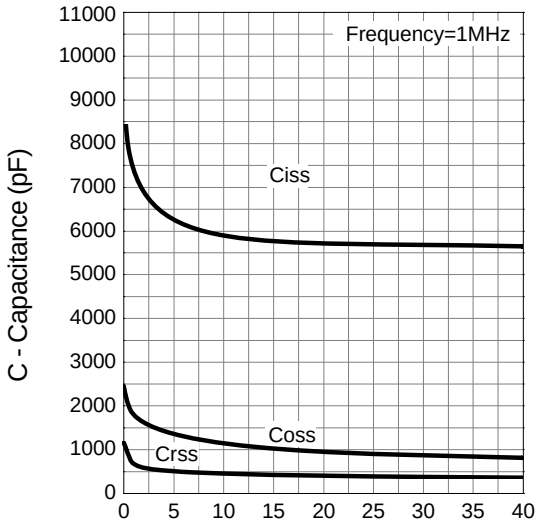
Drain-Source On Resistance



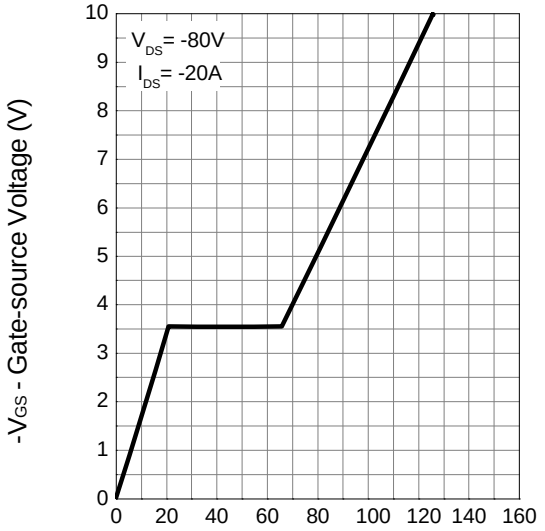
Source-Drain Diode Forward



Capacitance

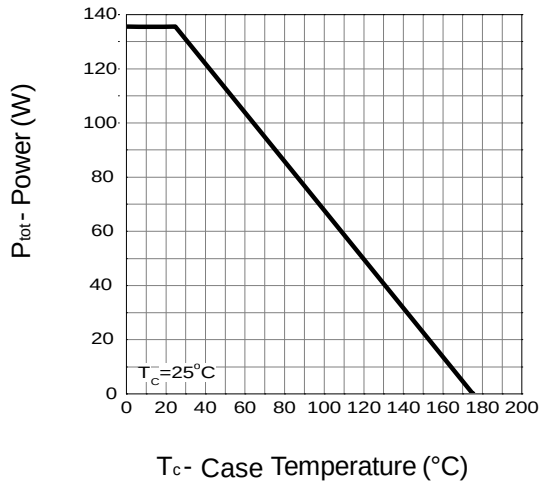


Gate Charge

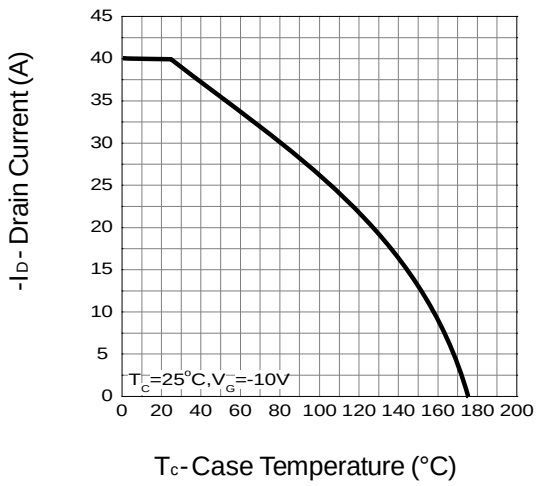


Typical Characteristics

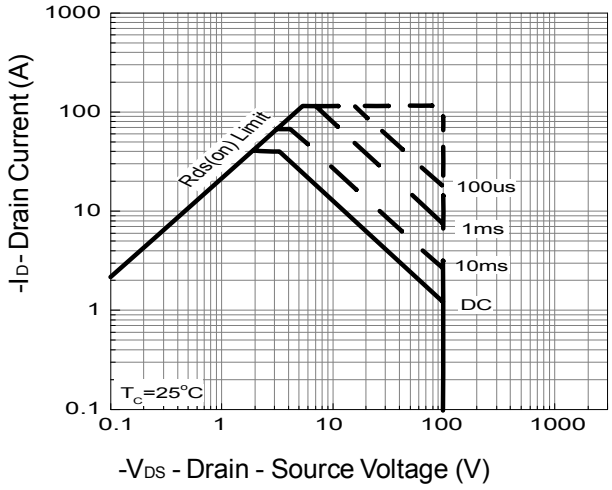
Power Dissipation



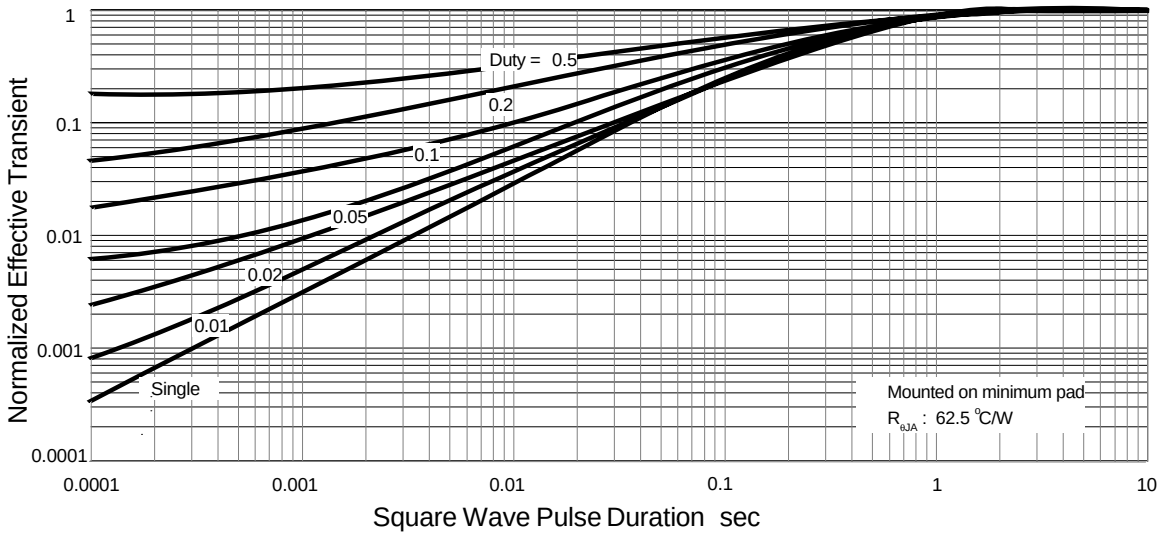
Drain Current



Safe Operation Area

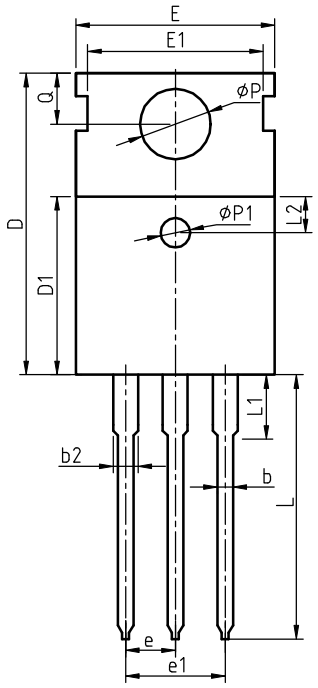


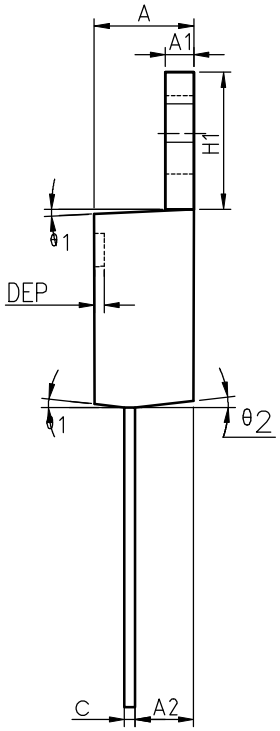
Thermal Transient Impedance

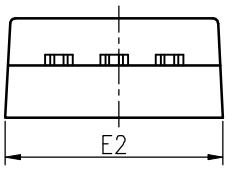


Package Information

TO-220FB-3L





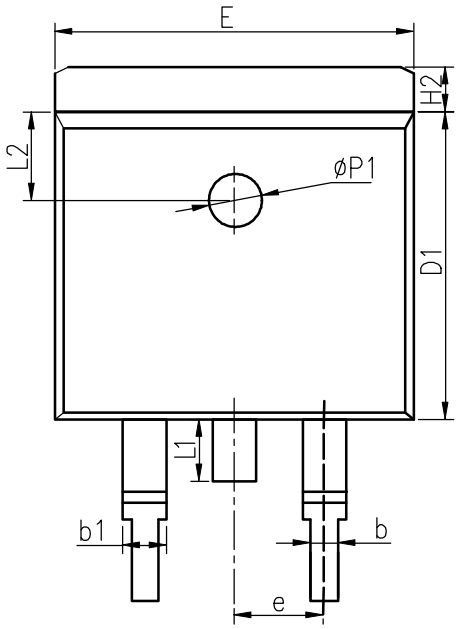


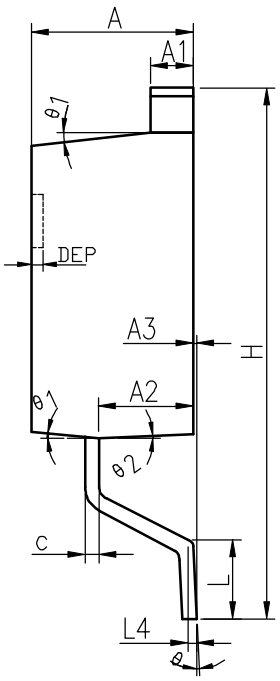
COMMON DIMENSIONS

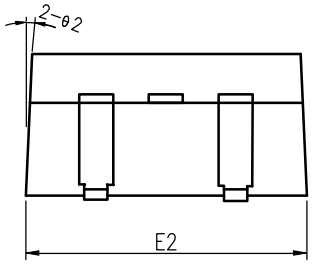
SYMBOL	MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185
A1	1.27	1.30	1.33	0.050	0.051	0.052
A2	2.35	2.40	2.50	0.093	0.094	0.098
b	0.77	0.80	0.90	0.030	0.031	0.035
b2	1.17	1.27	1.36	0.046	0.050	0.054
c	0.48	0.50	0.56	0.019	0.020	0.022
D	15.40	15.60	15.80	0.606	0.614	0.622
D1	9.00	9.10	9.20	0.354	0.358	0.362
DEP	0.05	0.10	0.20	0.002	0.004	0.008
E	9.80	10.00	10.20	0.386	0.394	0.402
E1	-	8.70	-	-	0.343	-
E2	9.80	10.00	10.20	0.386	0.394	0.402
e		2.54	BSC		0.100	BSC
e1		5.08	BSC		0.200	BSC
H1	6.40	6.50	6.60	0.252	0.256	0.260
L	12.75	13.50	13.65	0.502	0.531	0.537
L1	-	3.10	3.30	-	0.122	0.130
L2		2.50	REF		0.098	REF
P	3.50	3.60	3.63	0.138	0.142	0.143
P1	3.50	3.60	3.63	0.138	0.142	0.143
Q	2.73	2.80	2.87	0.107	0.110	0.113
θ1	5°	7°	9°	5°	7°	9°
θ2	1°	3°	5°	1°	3°	5°
θ3	1°	3°	5°	1°	3°	5°

Package Information

TO-263-2L







COMMON DIMENSIONS

SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185
A1	1.22	1.27	1.32	0.048	0.050	0.052
A2	2.59	2.69	2.79	0.102	0.106	0.110
A3	0.00	0.10	0.20	0.000	0.004	0.008
b	0.77	0.813	0.90	0.030	0.032	0.035
b1	1.20	1.270	1.36	0.047	0.050	0.054
c	0.34	0.381	0.47	0.013	0.015	0.019
D1	8.60	8.70	8.80	0.339	0.343	0.346
E	10.00	10.16	10.26	0.394	0.400	0.404
E2	10.00	10.10	10.20	0.394	0.398	0.402
e		2.54 BSC			0.100 BSC	
H	14.70	15.10	15.50	0.579	0.594	0.610
H2	1.17	1.27	1.40	0.046	0.050	0.055
L	2.00	2.30	2.60	0.079	0.091	0.102
L1	1.45	1.55	1.70	0.057	0.061	0.067
L2		2.50 REF			0.098 REF	
L4		0.25 BSC			0.010 BSC	
	0°	5°	8°	0°	5°	8°
1	5°	7°	9°	5°	7°	9°
2	1°	3°	5°	1°	3°	5°
ΦP1	1.40	1.50	1.60	0.055	0.059	0.063
DEP	0.05	0.10	0.20	0.002	0.004	0.008

Devices Per Unit

Package Type	Unit	Quantity
TO-220FB-3L	Tube	50
TO-263-2L	Tube	50

Classification Profile