

SE40P20B

P-Channel MOSFET

Revision: A

General Description

This series is a high voltage power MOSFET and is designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and have a high rugged avalanche characteristics

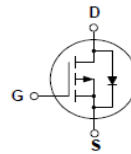
Features

For a single MOSFET

- $V_{DS} = -40V$
- $R_{DS(ON)} = 26m\Omega @ V_{GS} = -10V$

Pin configurations

See Diagram below



Absolute Maximum Ratings

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	-40	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current	Continuous	I_D	-20	A
	Pulsed		-50	
Power Dissipation		P_D	80	W
Operating Junction Temperature Range		T_J	-55 to 150	$^{\circ}C$

Thermal Resistance

Symbol	Parameter	Typ	Max	Units
$R_{\theta JA}$	Junction to Ambient		20	$^{\circ}C/W$

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Electrical Characteristics (T _J =25°C unless otherwise noted)						
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS (Note 2)						
B _V DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-40			V
I _{DSS}	Drain to Source Leakage Current	V _{DS} =-30V, V _{GS} =0V			-10	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =20V			100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D =-250μA	-1.5	-1.9	-3	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-10V, I _D =-5A		26	32	mΩ
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-12A	34			S
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-20V, f=1MHz		2960		pF
C _{oss}	Output Capacitance			370		pF
C _{rss}	Reverse Transfer Capacitance			310		pF
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-20V, I _D =-12A		72		nC
Q _{gs}	Gate Source Charge			14		nC
Q _{gd}	Gate Drain Charge			15		nC
t _{d(on)}	Turn-On Delay Time	V _{GS} =-10V, V _{DS} =-20V, R _{GEN} =3Ω		10		ns
t _{d(off)}	Turn-Off Delay Time			38		ns
t _{d(r)}	Turn-On Rise Time			18		ns
t _{d(f)}	Turn-Off Fall Time			24		ns
Source-Drain Diode Characteristics						
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0V, I _S =-1A			-1.2	V
I _S	Continuous Source Current				-40	A

Typical Characteristics

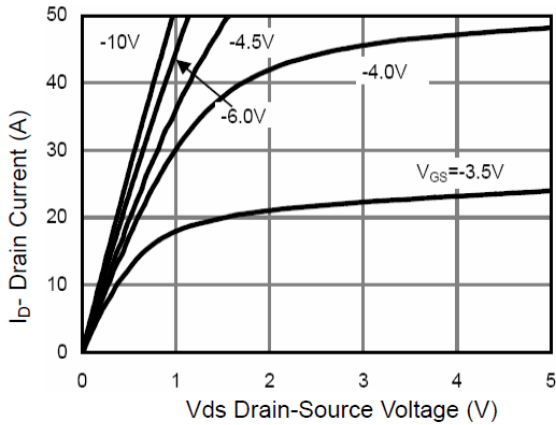


Figure 1 Output Characteristics

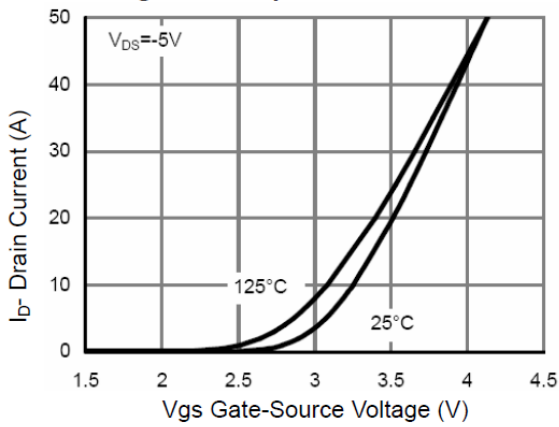


Figure 2 Transfer Characteristics

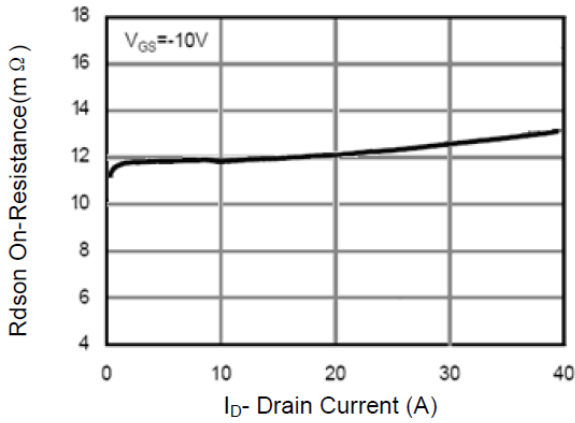


Figure 3 Rdson- Drain Current

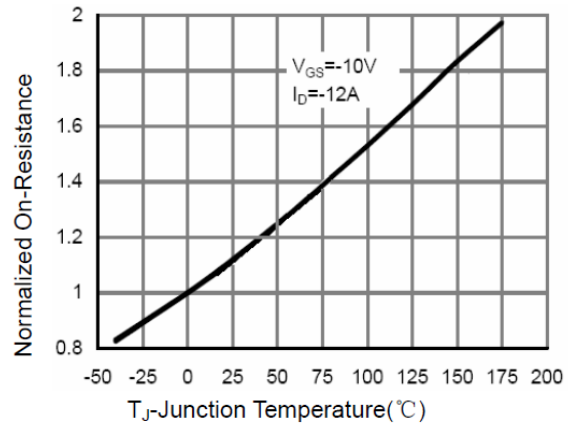


Figure 4 Rdson-Junction Temperature

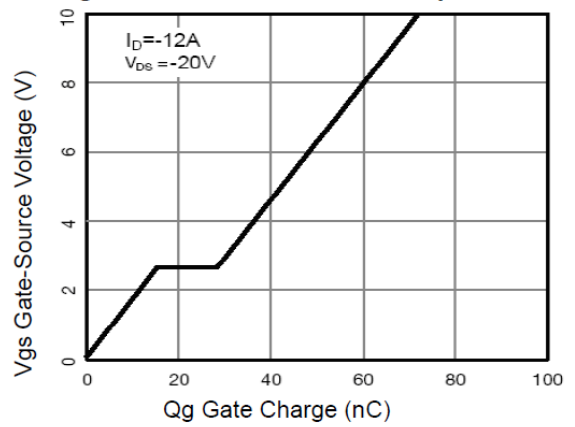


Figure 5 Gate Charge

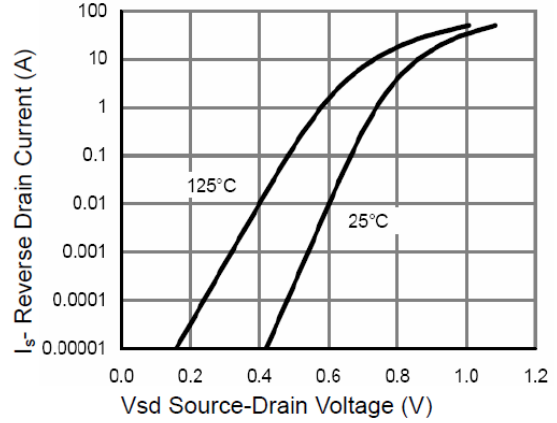


Figure 6 Source- Drain Diode Forward

Typical Characteristics

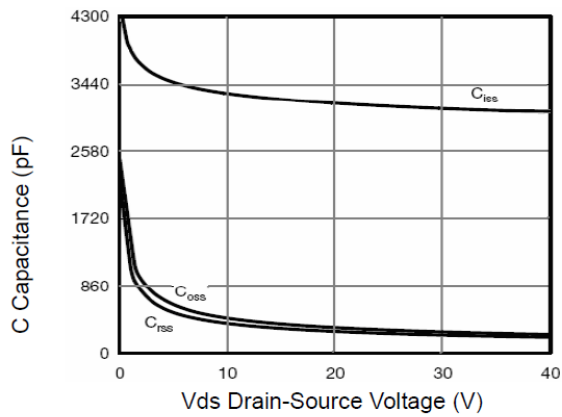


Figure 7 Capacitance vs Vds

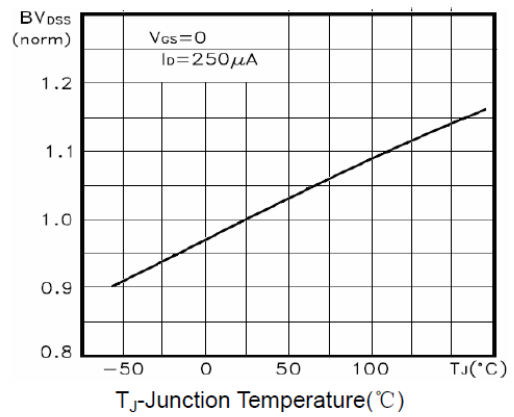


Figure 9 BV_{DSS} vs Junction Temperature

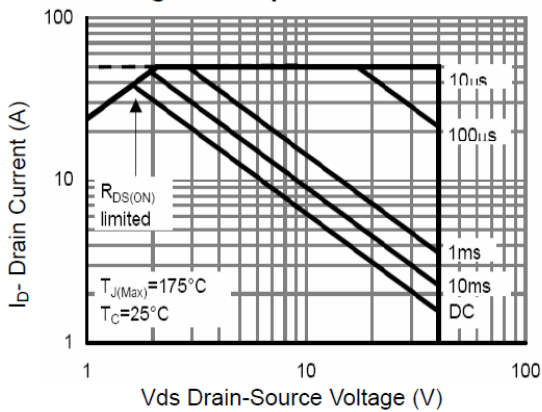


Figure 8 Safe Operation Area

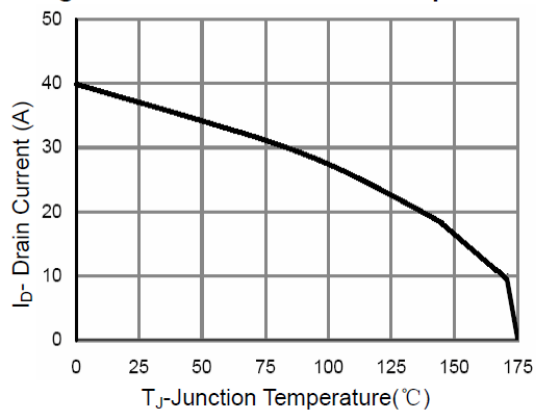


Figure 10 I_D Current Derating vs Junction Temperature

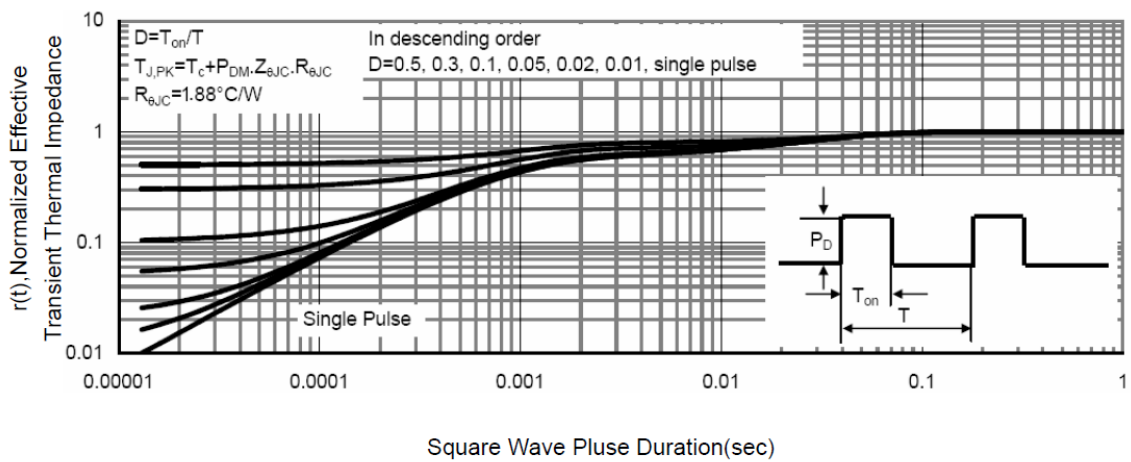
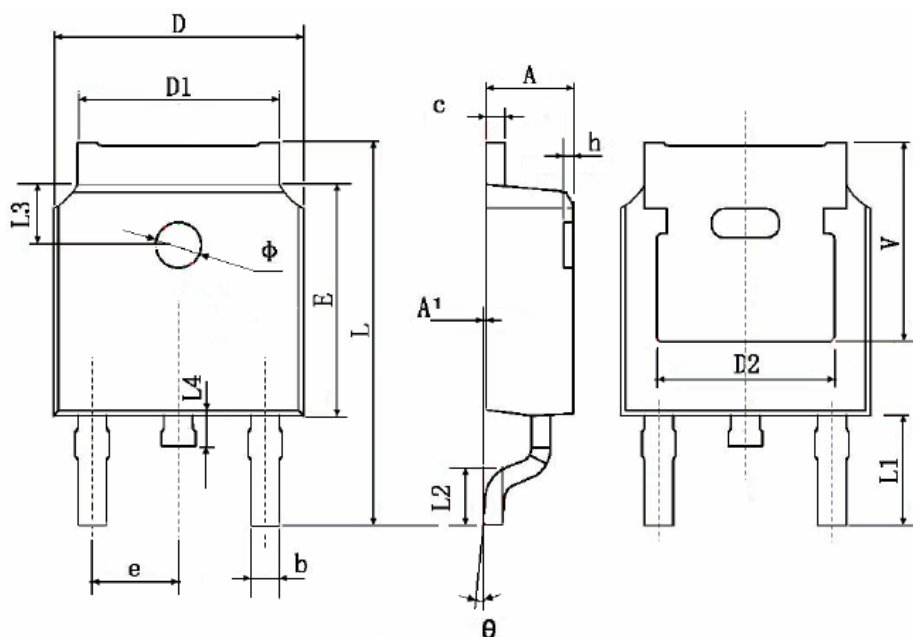


Figure 11 Normalized Maximum Transient Thermal Impedance

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Package Outline Dimension

TO-252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	