



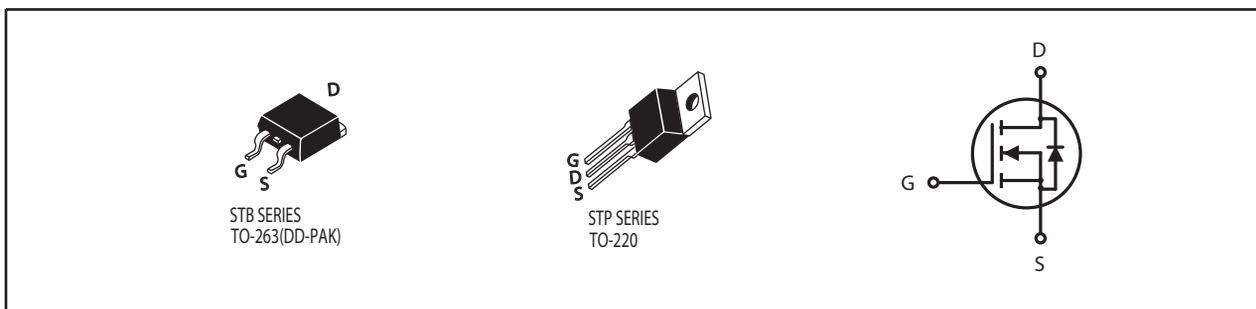
STB/P434S

N-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V _{DSS}	I _D	R _{DS(ON)} (mΩ) Max
40V	60A	9.2 @ V _{GS} =10V
		11.5 @ V _{GS} =4.5V

FEATURES

- Super high dense cell design for low R_{DS(ON)}.
- Rugged and reliable.
- TO-220 and TO-263 Package.



ABSOLUTE MAXIMUM RATINGS (T_A=25°C unless otherwise noted)

Symbol	Parameter	Limit	Units
V _{DS}	Drain-Source Voltage	40	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current-Continuous ^a	T _C =25°C	60
		T _C =70°C	48
I _{DM}	-Pulsed ^b	176	A
E _{AS}	Single Pulse Avalanche Energy ^d	91	mJ
P _D	Maximum Power Dissipation ^a	T _C =25°C	62.5
		T _C =70°C	40
T _J , T _{STG}	Operating Junction and Storage Temperature Range	-55 to 150	°C

THERMAL CHARACTERISTICS

R _{θJC}	Thermal Resistance, Junction-to-Case ^a	2	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient ^a	62.5	°C/W

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ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	40			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =32V , V _{GS} =0V			1	uA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20V , V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1.3	1.7	3	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V , I _D =30A		7.6	9.2	m ohm
		V _{GS} =4.5V , I _D =25A		8.8	11.5	m ohm
g _{FS}	Forward Transconductance	V _{DS} =10V , I _D =30A		18		S
DYNAMIC CHARACTERISTICS ^c						
C _{ISS}	Input Capacitance	V _{DS} =20V, V _{GS} =0V f=1.0MHz		1160		pF
C _{OSS}	Output Capacitance			211		pF
C _{RSS}	Reverse Transfer Capacitance			135		pF
SWITCHING CHARACTERISTICS ^c						
t _{D(ON)}	Turn-On Delay Time	V _{DD} =20V I _D =1A V _{GS} =10V R _{GEN} =3.3 ohm		17		ns
t _r	Rise Time			24		ns
t _{D(OFF)}	Turn-Off Delay Time			59		ns
t _f	Fall Time			11		ns
Q _g	Total Gate Charge	V _{DS} =20V, I _D =30A, V _{GS} =10V		20		nC
		V _{DS} =20V, I _D =30A, V _{GS} =4.5V		10		nC
Q _{gs}	Gate-Source Charge	V _{DS} =20V, I _D =30A,		2.1		nC
Q _{gd}	Gate-Drain Charge	V _{GS} =10V		5		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
I _s	Maximum Continuous Drain-Source Diode Forward Current				10	A
V _{SD}	Diode Forward Voltage ^b	V _{GS} =0V, I _s =10A		0.84	1.3	V
Notes						
a. Surface Mounted on FR4 Board, t ≤ 10sec.						
b. Pulse Test: Pulse Width ≤ 300us, Duty Cycle ≤ 2%.						
c. Guaranteed by design, not subject to production testing.						
d. Starting T _J =25°C, L=0.5mH, V _{DD} = 20V. (See Figure 13)						

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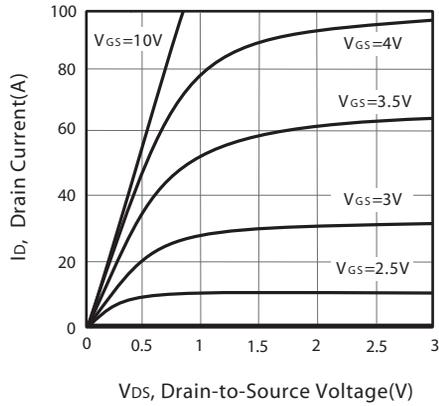


Figure 1. Output Characteristics

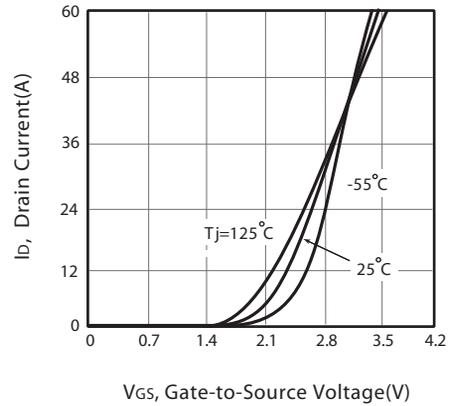


Figure 2. Transfer Characteristics

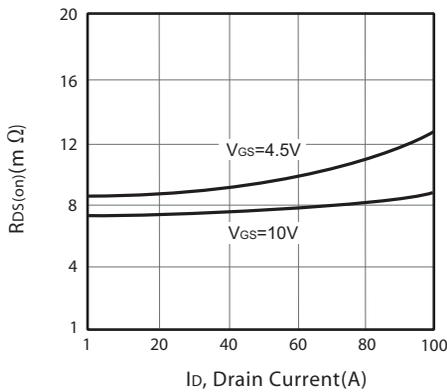


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

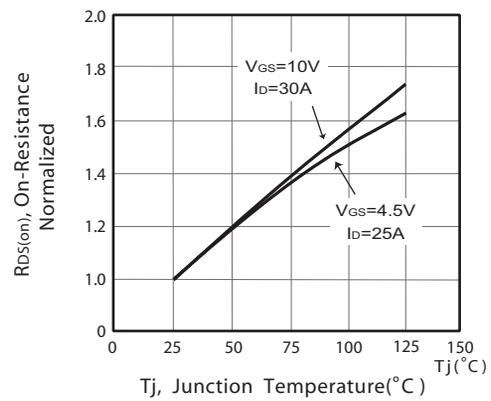


Figure 4. On-Resistance Variation with Drain Current and Temperature

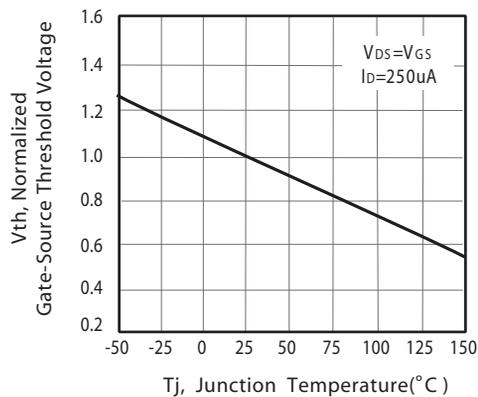


Figure 5. Gate Threshold Variation with Temperature

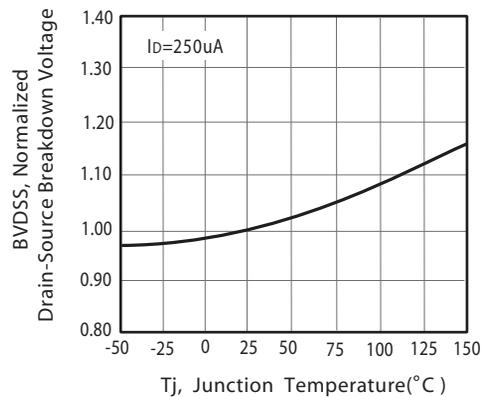


Figure 6. Breakdown Voltage Variation with Temperature

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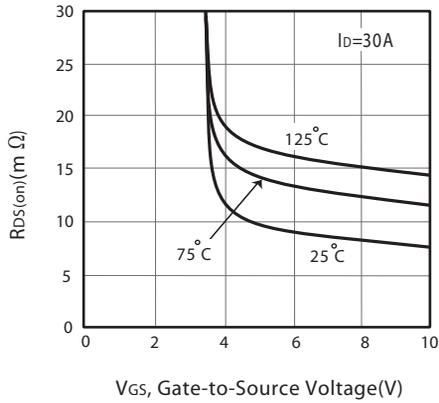


Figure 7. On-Resistance vs. Gate-Source Voltage

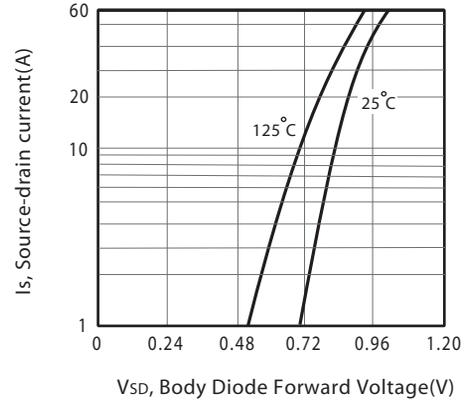


Figure 8. Body Diode Forward Voltage Variation with Source Current

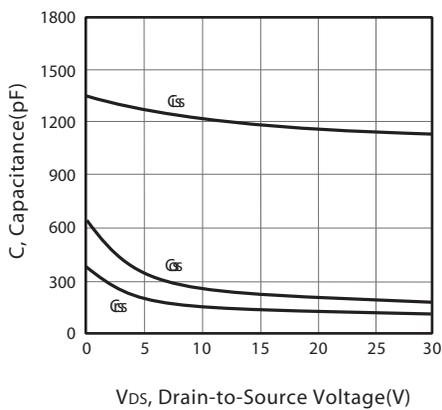


Figure 9. Capacitance

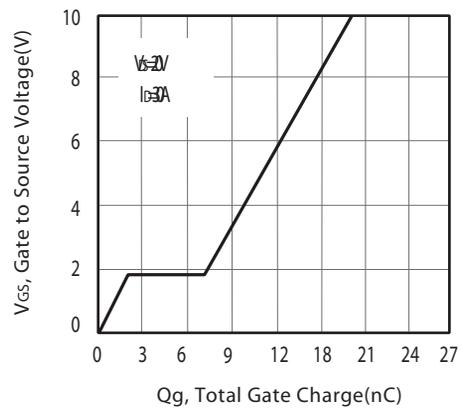


Figure 10. Gate Charge

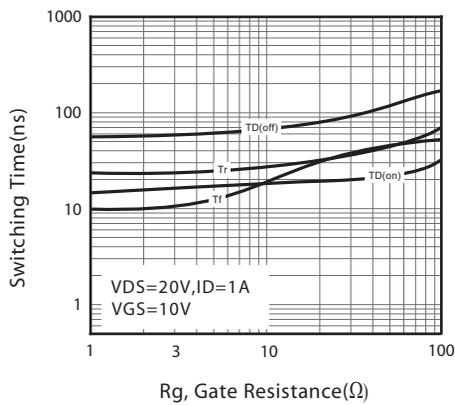


Figure 11. switching characteristics

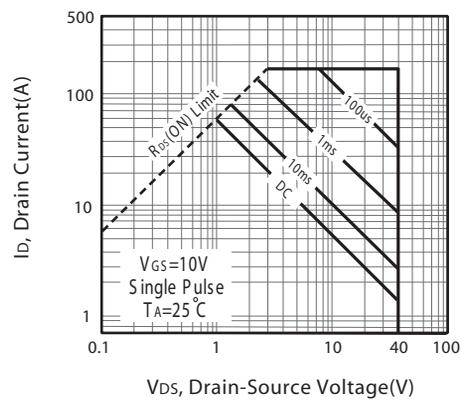
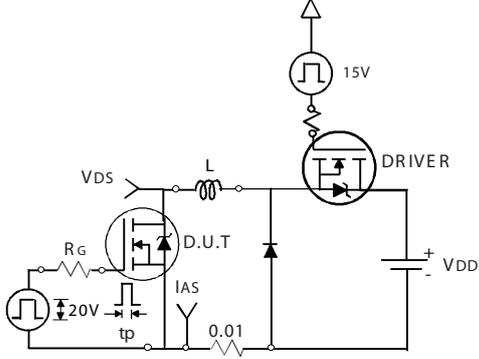


Figure 12. Maximum Safe Operating Area

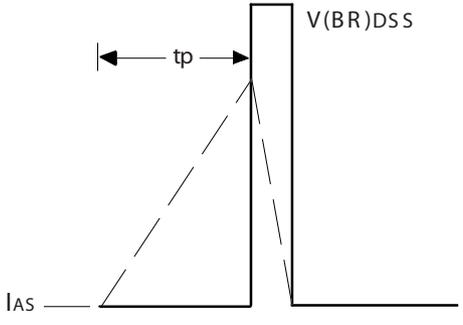
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Unclamped Inductive Test Circuit
Figure 13a.



Unclamped Inductive Waveforms
Figure 13b.

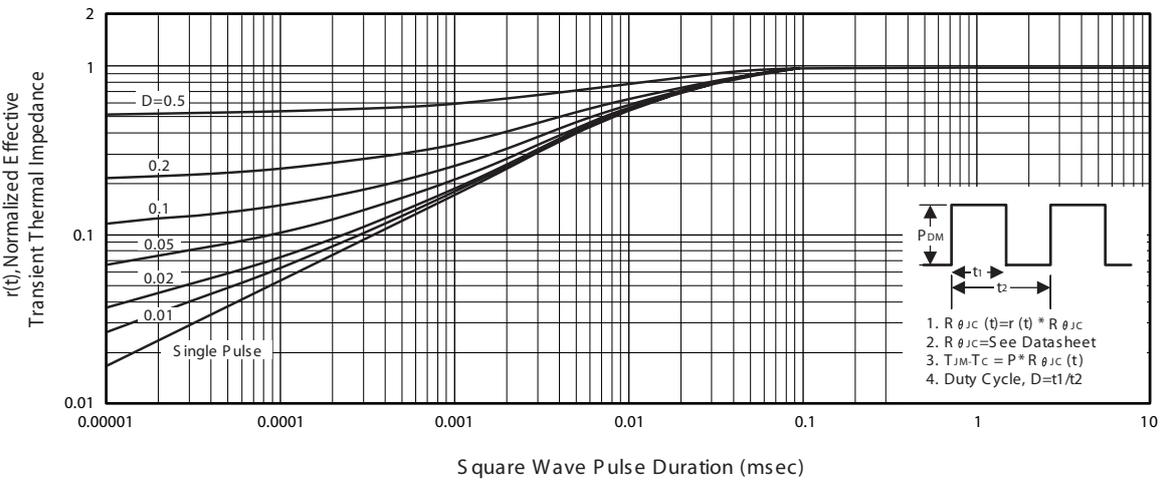


Figure 14. Normalized Thermal Transient Impedance Curve

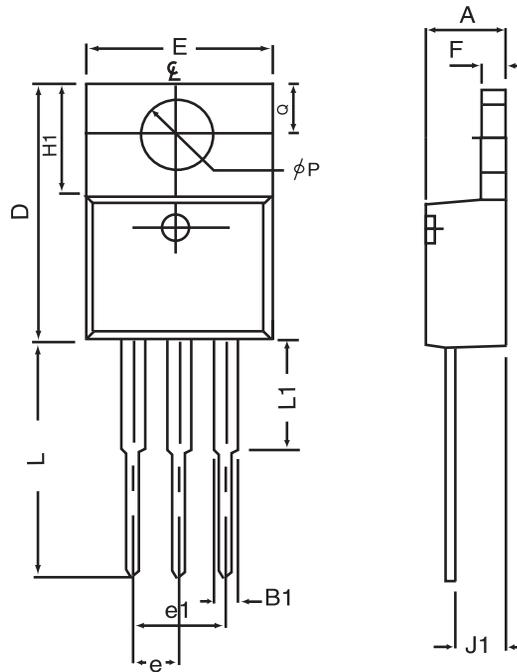
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Preliminary

PACKAGE OUTLINE DIMENSIONS

TO-220



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.32	4.80	0.170	0.189
B1	1.27	1.65	0.050	0.630
D	14.6	16.00	0.575	0.610
E	9.70	10.41	0.382	0.410
e	2.34	2.74	0.092	0.108
e1	4.68	5.48	0.184	0.216
F	1.14	1.40	0.045	0.055
H1	5.97	6.73	0.235	0.265
J1	2.20	2.79	0.087	0.110
L	12.88	14.22	0.507	0.560
L1	3.00	6.35	0.120	0.250
φP	3.50	3.94	0.138	0.155
Q	2.54	3.05	0.100	0.120

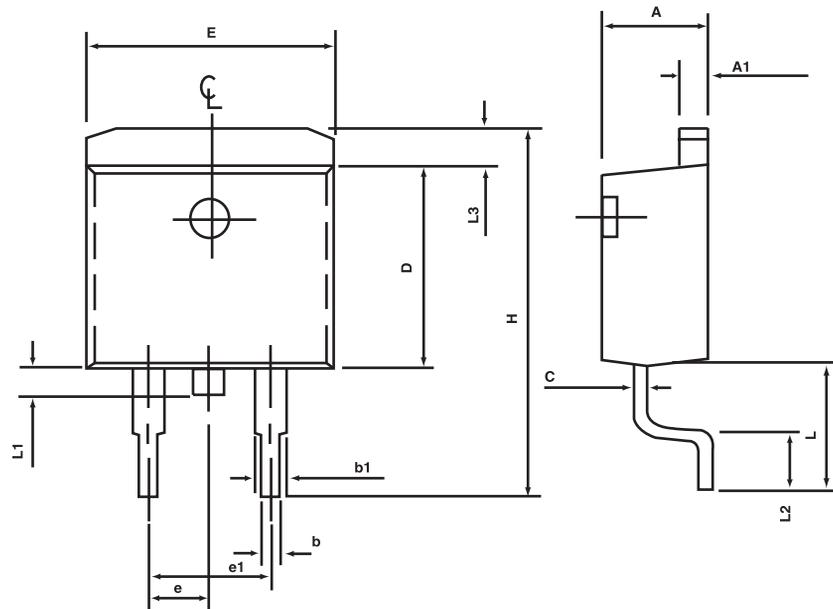
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PACKAGE OUTLINE DIMENSIONS

TO-263AB



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.70	0.169	0.185
A1	1.22	1.32	0.048	0.055
b	0.69	0.94	0.027	0.037
b1	1.22	1.40	0.048	0.055
C	0.36	0.56	0.014	0.022
D	8.64	9.652	0.340	0.380
E	9.70	10.54	0.382	0.415
e	2.29	2.79	0.090	0.110
e1	4.83	5.33	0.190	0.210
H	14.60	15.78	0.575	0.625
L	4.70	5.84	0.185	0.230
L1	1.20	1.778	0.047	0.070
L2	2.24	2.84	0.088	0.111
L3	1.40 MAX		0.055 MAX	

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