



STP/B3055L2

N-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

V _{DSS}	I _D	R _{DS(ON)} (m Ω) Max
20V	18A	40 @ V _{GS} = 4.5V
		60 @ V _{GS} = 2.5V

FEATURES

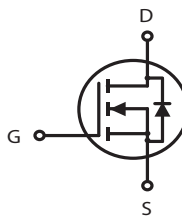
- Super high dense cell design for low R_{DS(ON)}.
- Rugged and reliable.
- TO-220 and TO-263 Package.



STB SERIES
TO-263(DD-PAK)



STP SERIES
TO-220



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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	20	V
Gate-Source Voltage	V _{GS}	±12	V
Drain Current-Continuous @ T _J =25°C -Pulsed	I _D	18	A
	I _{DM}	45	A
Drain-Source Diode Forward Current	I _S	15	A
Maximum Power Dissipation @ T _c =25°C	P _D	50	W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to 175	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Case	R θ JC	3	°C/W
Thermal Resistance, Junction-to-Ambient	R θ JA	50	°C/W

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

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =16V, V _{GS} =0V			1	uA
Gate-Body Leakage	I _{GSS}	V _{GS} =±12V, V _{DS} =0V			±100	nA
ON CHARACTERISTICS ^b						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D = 250uA	0.6	1	1.7	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D = 6.0A		25	40	m-ohm
		V _{GS} =2.5V, I _D = 5.2A		40	60	m-ohm
On-State Drain Current	I _{D(ON)}	V _{DS} = 5V, V _{GS} = 4.5V	20			A
Forward Transconductance	g _{FS}	V _{DS} = 10V, I _D =5.0A		17		S
DYNAMIC CHARACTERISTICS ^c						
Input Capacitance	C _{ISS}	V _{DS} =8V, V _{GS} = 0V f =1.0MHz		800		pF
Output Capacitance	C _{OSS}			205		pF
Reverse Transfer Capacitance	C _{RSS}			165		pF
SWITCHING CHARACTERISTICS ^c						
Turn-On Delay Time	t _{D(ON)}	V _{DD} = 10V, I _D = 1A, V _{GEN} = 4.5V, R _L = 10 ohm R _{GEN} = 6 ohm		21.5		ns
Rise Time	t _r			8.5		ns
Turn-Off Delay Time	t _{D(OFF)}			39.5		ns
Fall Time	t _f			20		ns
Total Gate Charge	Q _g	V _{DS} =10V, I _D =6A, V _{GS} =10V		14.7		nC
		V _{DS} =10V, I _D =6A, V _{GS} =4.5V		11.6		nC
Gate-Source Charge	Q _{gs}	V _{DS} =10V, I _D = 6A, V _{GS} =10V		2.2		nC
Gate-Drain Charge	Q _{gd}			3.6		nC

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

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS ^b						
Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _S = 15A		1.1	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.

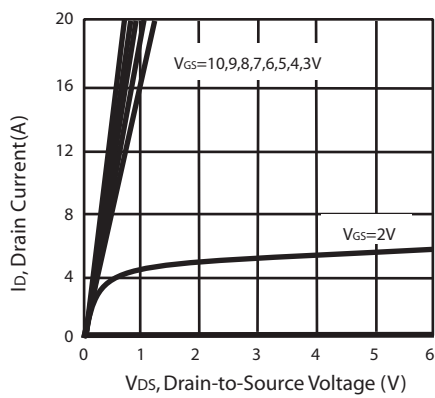


Figure 1. Output Characteristics

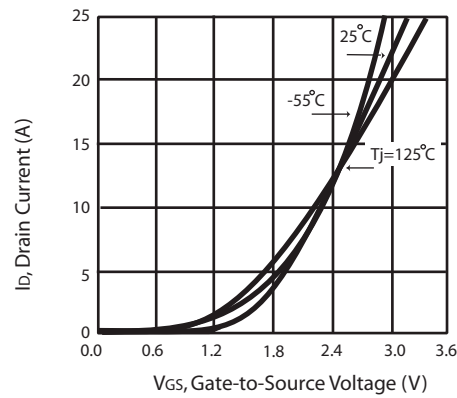


Figure 2. Transfer Characteristics

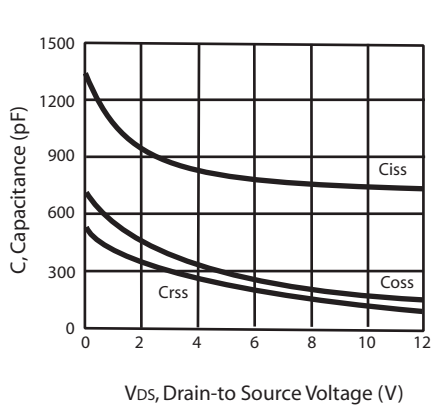


Figure 3. Capacitance

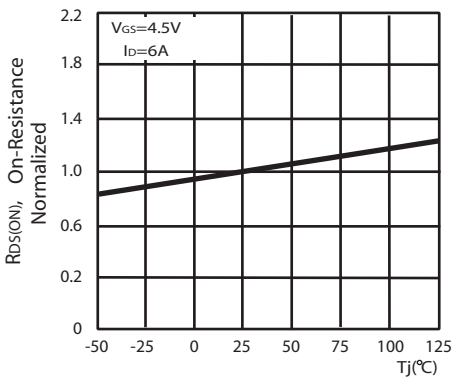


Figure 4. On-Resistance Variation with Temperature

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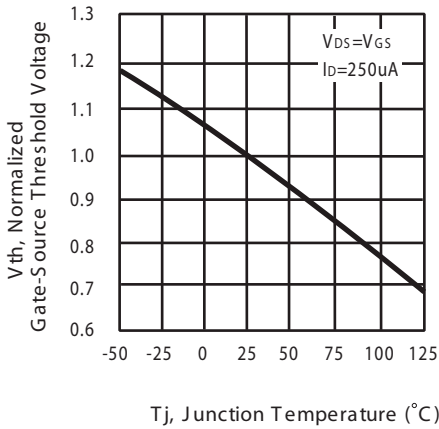


Figure 5. Gate Threshold Variation with Temperature

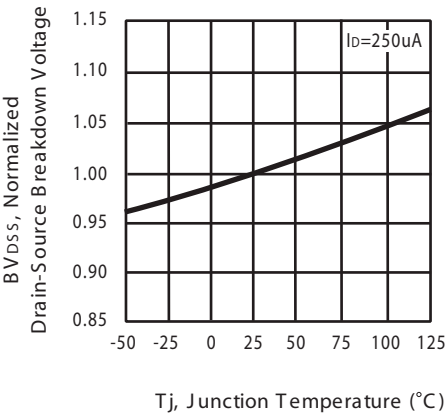


Figure 6. Breakdown Voltage Variation with Temperature

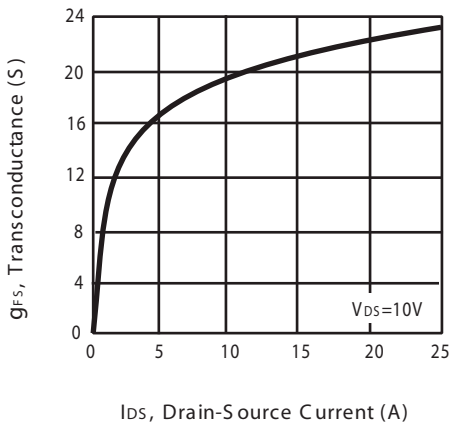


Figure 7. Transconductance Variation with Drain Current

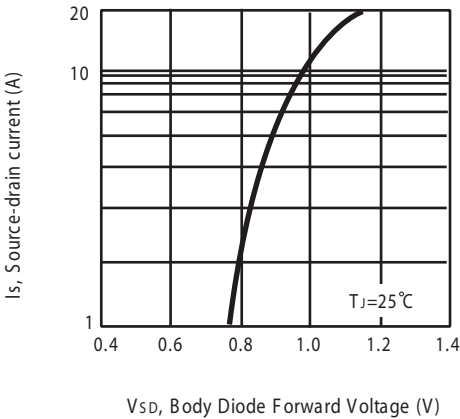


Figure 8. Body Diode Forward Voltage Variation with Source Current

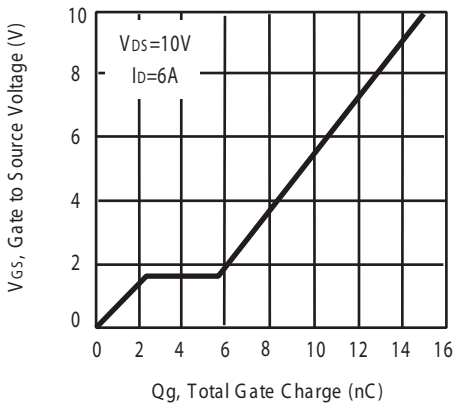


Figure 9. Gate Charge

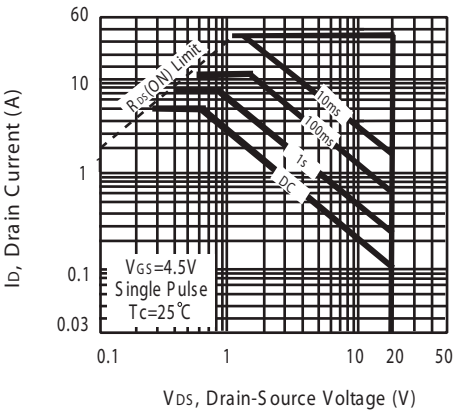


Figure 10. Maximum Safe Operating Area

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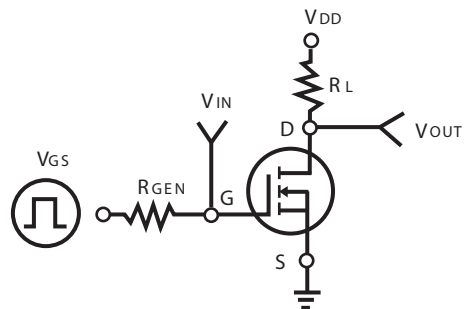


Figure 11. Switching Test Circuit

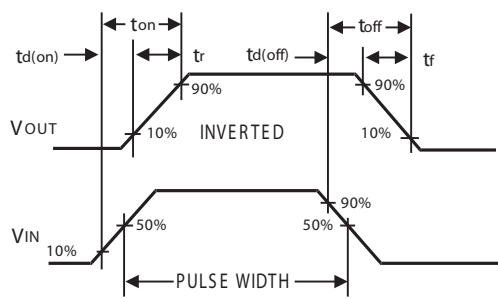


Figure 12. Switching Waveforms

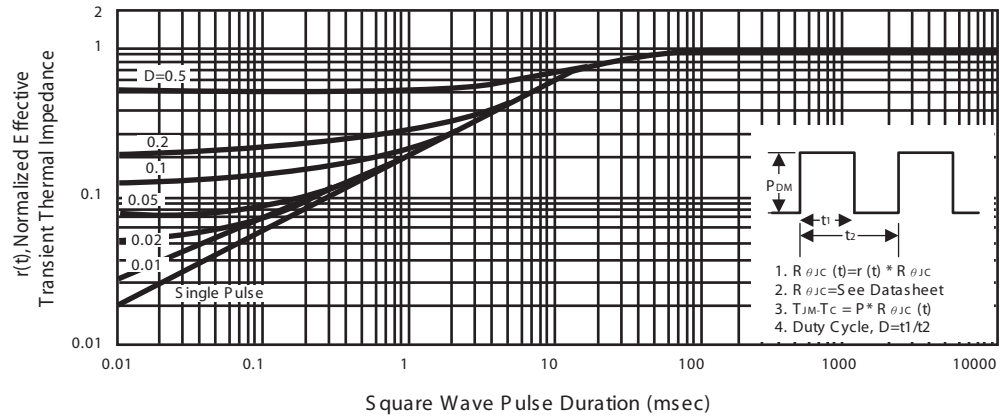
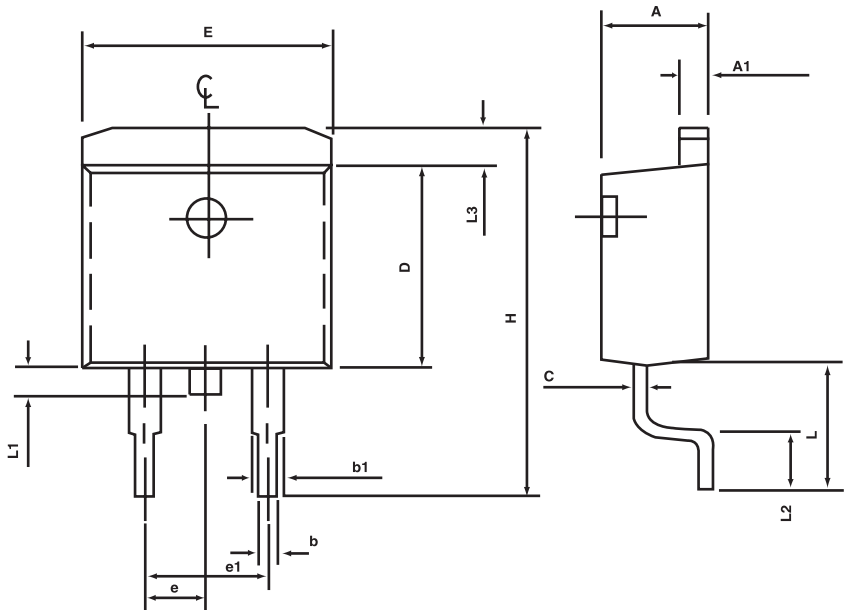


Figure 13. Normalized Thermal Transient Impedance Curve

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PACKAGE OUTLINE DIMENSIONS

TO-263

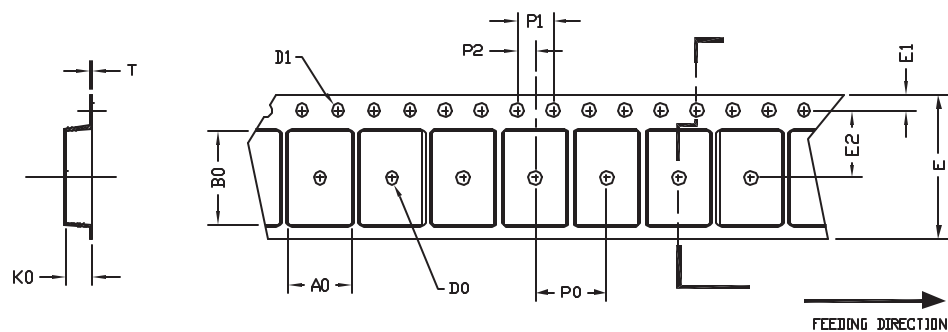


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.70	0.169	0.185
A1	1.22	1.32	0.048	0.055
b	0.69	0.94	0.027	0.037
b1	1.22	1.40	0.048	0.055
C	0.36	0.56	0.014	0.022
D	8.64	9.652	0.340	0.380
E	9.70	10.54	0.382	0.415
e	2.29	2.79	0.090	0.110
e1	4.83	5.33	0.190	0.210
H	14.60	15.78	0.575	0.625
L	4.70	5.84	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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TO-263 Tape and Reel Data

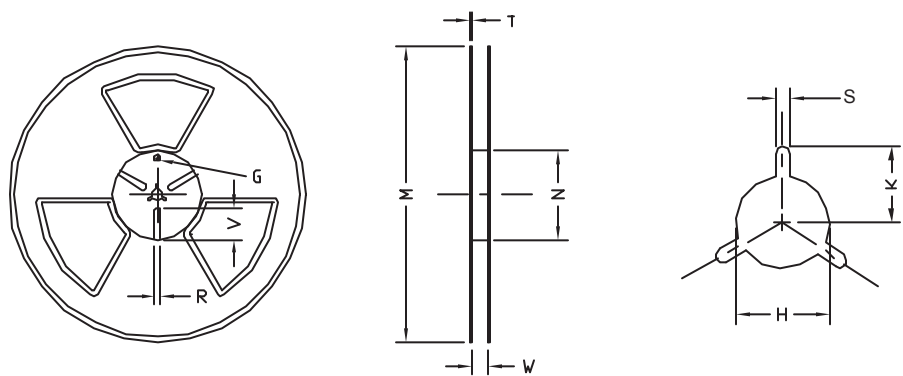
TO-263 Carrier Tape



UNIT:mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
TO-252□ (16 mm)	6.80 ±0.1	10.3 ±0.1	2.50 ±0.1	φ 2	φ 1.5□ + 0.1□ - 0	16.0 0.3±	1.75 0.1±	7.5 ±0.15	8.0 ±0.1	4.0 ±0.1	2.0 ±0.15	0.3□ ±0.05

TO-263 Reel



UNIT:mm

TAPE SIZE	REEL SIZE	M	N	W	T	H	K	S	G	R	V
16 mm	φ 330	φ 330□ ± 0.5	φ 97□ ± 1.0	17.0□ + 1.5□ - 0	2.2	φ 13.0□ + 0.5□ - 0.2	10.6	2.0 ±0.5	---	---	---