

MT30026B

N-Channel Power MOSFET

30 V, 130 A, 2.6 mΩ

Features

- Typ $R_{DS(on)} = 2.6\text{ m}\Omega$ at $V_{GS} = 10\text{ V}$, $I_D = 10\text{ A}$
- High performance trench technology for extremely low $R_{DS(on)}$
- High power and current handling capability

General Description

This N-Channel MOSFET has been designed specifically to improve the overall efficiency of DC/DC converters using either synchronous or conventional switching PWM controllers. It has been optimized for low gate charge, low $R_{DS(ON)}$ and fast switching speed.

Applications

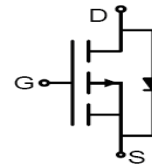
- DC-DC primary bridge
- DC-DC Synchronous rectification
- Power Management for Inverter Systems



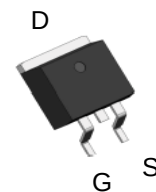
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Simplified Schematic



MARKING DIAGRAM & PIN ASSIGNMENT



TO-263-2L

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _A =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		30	V
V _{GSS}	Gate-Source Voltage		± 20	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current	T _C =25°C	130	A

Mounted on Large Heat Sink

I _{DM}	Pulsed Drain Current *		330	A
I _D	Continuous Drain Current	T _C =25°C	130	A
		T _C =100°C	70	
P _D	Maximum Power Dissipation	T _C =25°C	55	W
		T _C =100°C	38	
R _{θJC}	Thermal Resistance-Junction to Case		1.3	°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient		32.5	
Avalanche Ratings				
E _{AS}	Avalanche Energy, Single Pulsed	L=0.5mH	220***	mJ

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

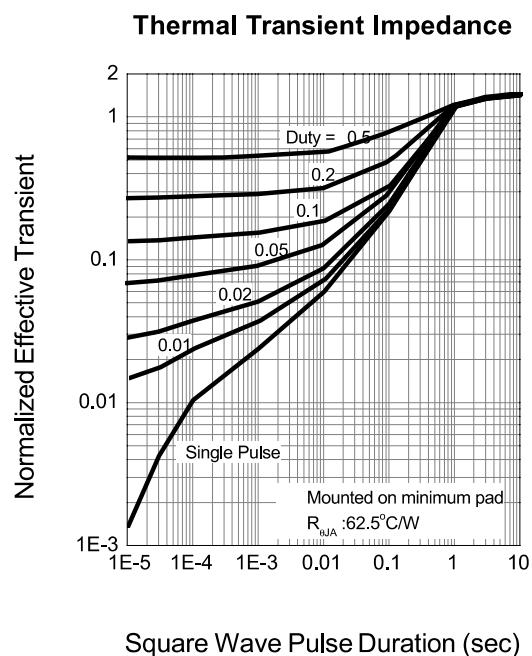
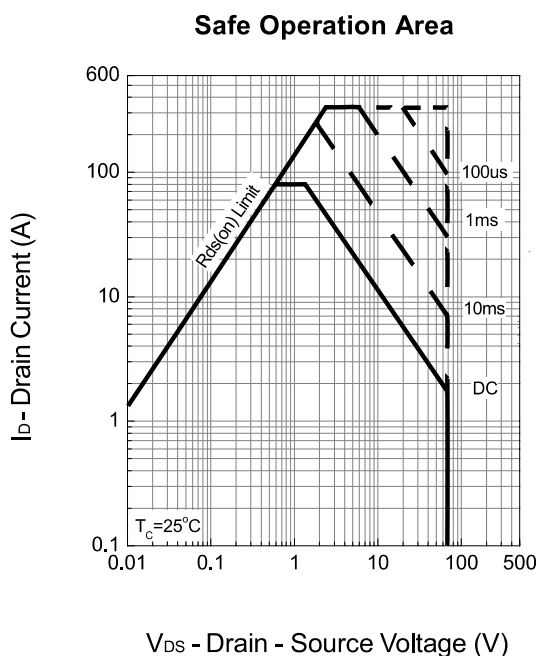
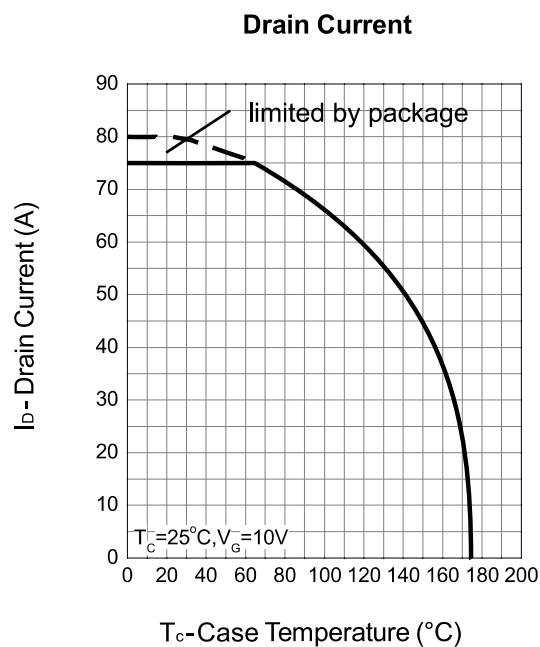
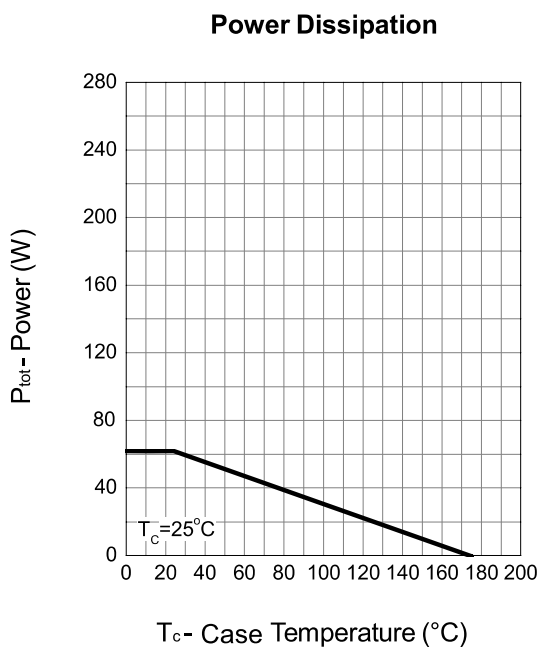
Symbol	Parameter	Test Conditions				Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, V _{GS} =0V	-	-	1	μA
		T _J =85°C	-	-	10	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1	1.6	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} =10A	-	2.6	4.0	mΩ
Diode Characteristics						
V _{SD} *	Diode Forward Voltage	I _{SD} =10A, V _{GS} =0V	-	0.8	1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} =10 A, dI _{SD} /dt=100A/μs	-	33	-	ns
Q _{rr}	Reverse Recovery Charge		-	61	-	nC

Electrical Characteristics (Cont.) (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions				Unit
			Min.	Typ.	Max.	
Dynamic Characteristics						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	1.8	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =25V, Frequency=1.0MHz	-	3203	-	pF
C _{oss}	Output Capacitance		-	362	-	
C _{rss}	Reverse Transfer Capacitance		-	277	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =24V, R _G =3 Ω, I _{DS} =40A, V _{GS} =10V,	-	15	-	ns
T _r	Turn-on Rise Time		-	13	-	
t _{d(OFF)}	Turn-off Delay Time		-	20	-	
T _f	Turn-off Fall Time		-	8	-	
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _{DS} =40A	-	84	-	nC
Q _{gs}	Gate-Source Charge		-	14	-	
Q _{gd}	Gate-Drain Charge		-	30	-	

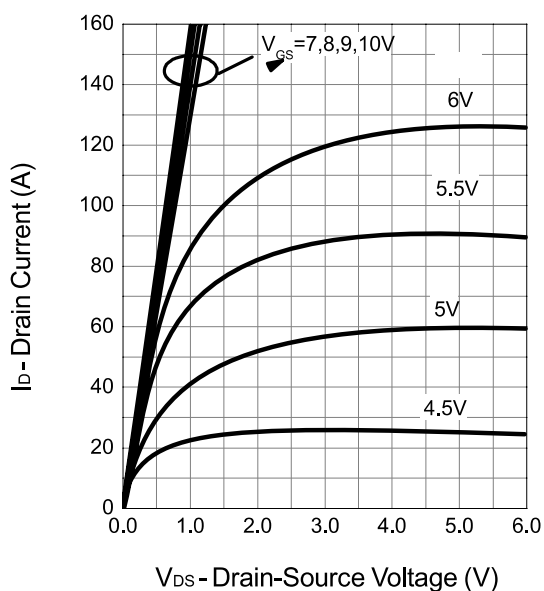
Note * : Pulse test ; pulse width ≤ 300μs, duty cycle ≤ 2%.

Typical Operating Characteristics

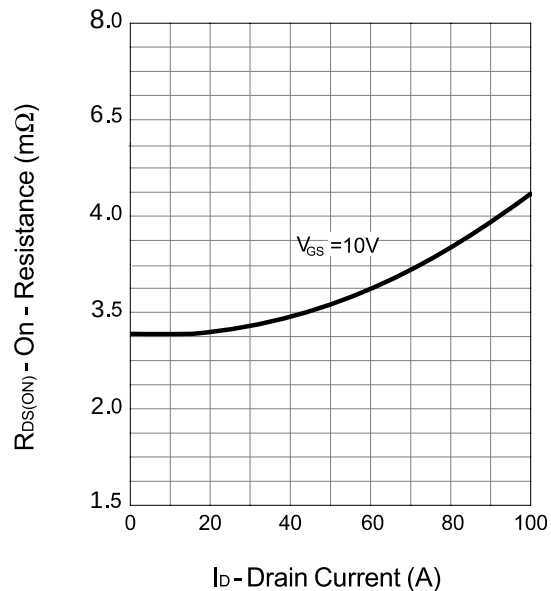


Typical Operating Characteristics (Cont.)

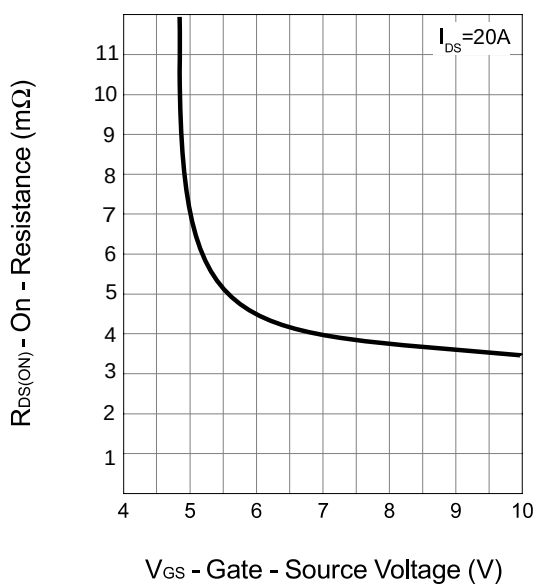
Output Characteristics



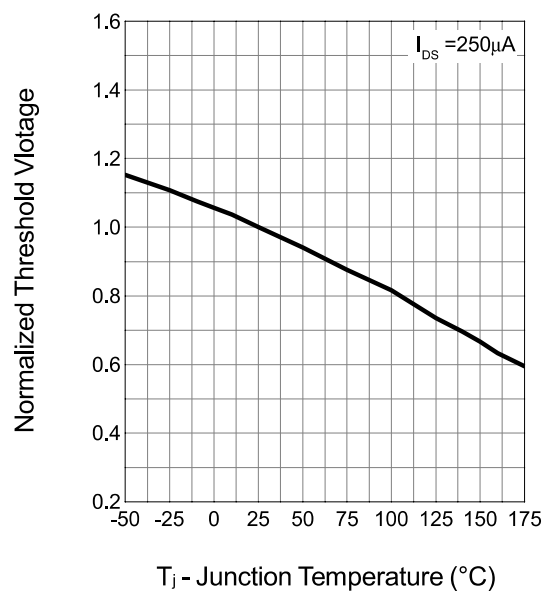
Drain-Source On Resistance



Drain-Source On Resistance

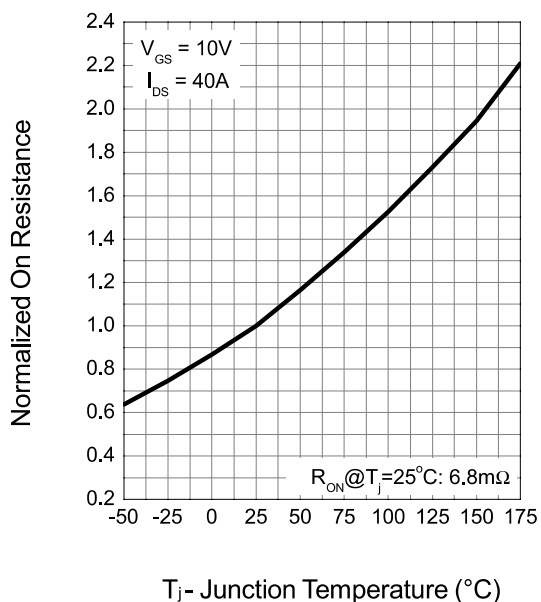


Gate Threshold Voltage

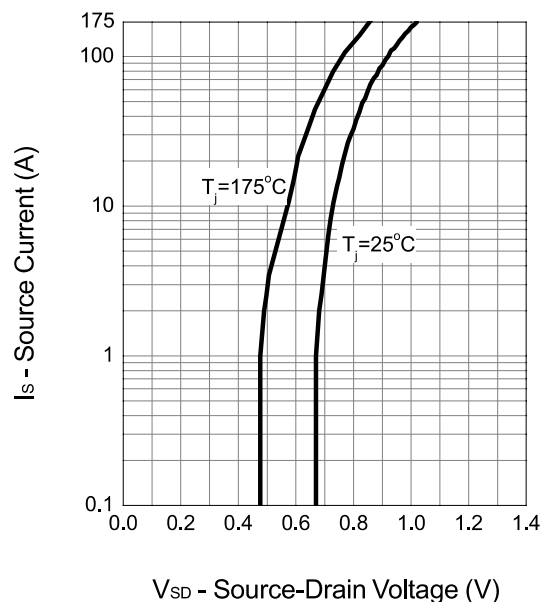


Typical Operating Characteristics (Cont.)

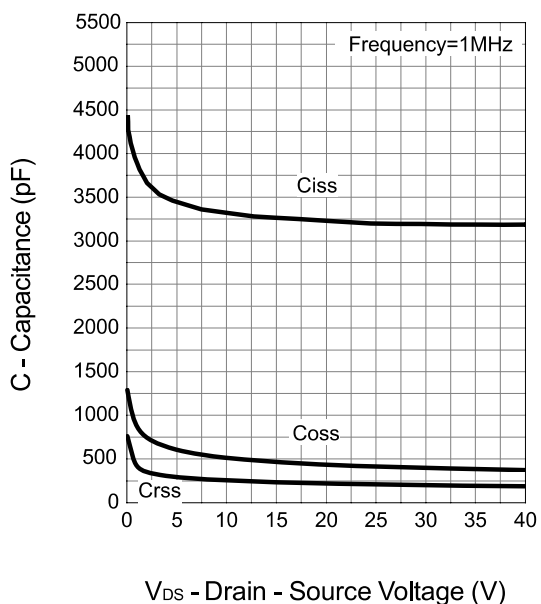
Drain-Source On Resistance



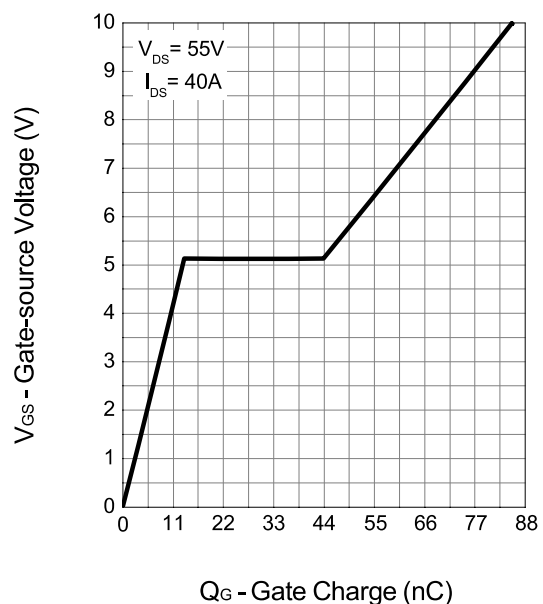
Source-Drain Diode Forward



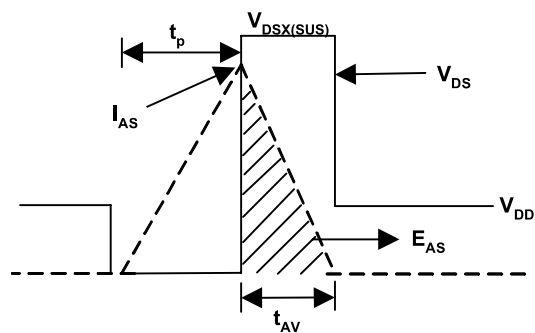
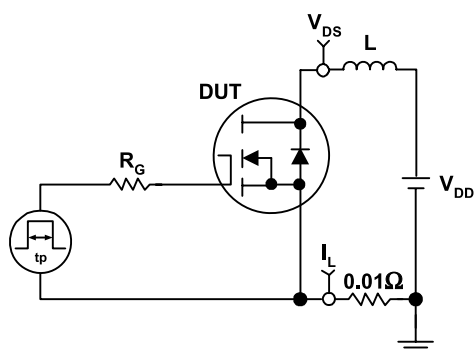
Capacitance



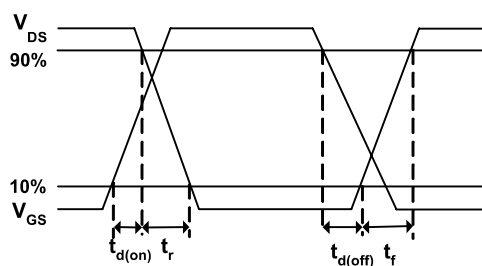
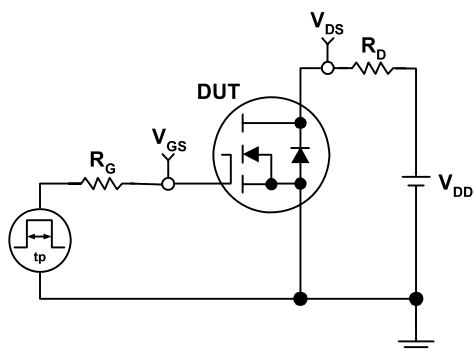
Gate Charge



Avalanche Test Circuit and Waveforms



Avalanche Test Circuit and Waveforms

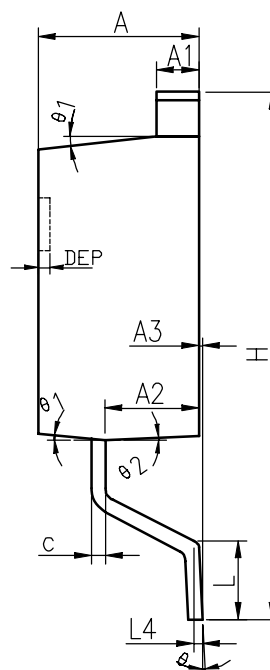
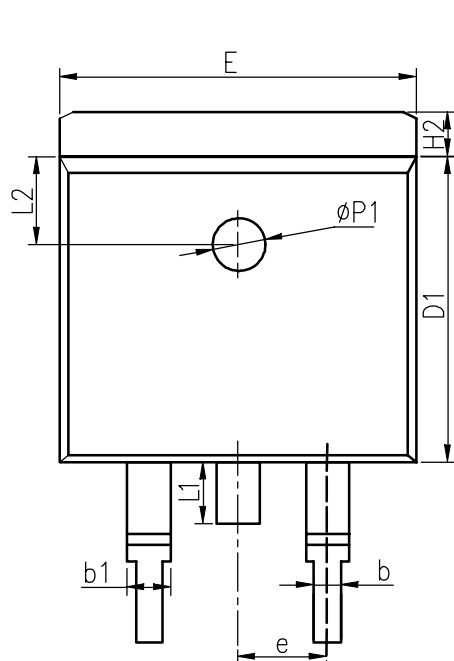


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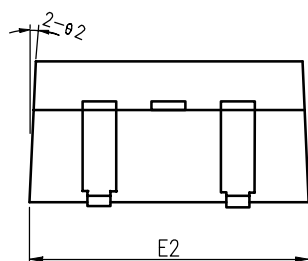
Version

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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



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