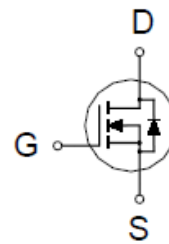
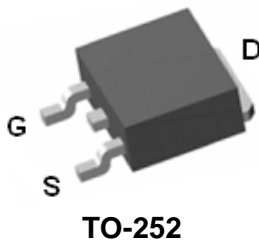


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N-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
40V	30mΩ @ $V_{GS} = 10V$	29A



ABSOLUTE MAXIMUM RATINGS ($T_A = 25\text{ °C}$ Unless Otherwise Noted)

100% Rg tested

100% UIS tested

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	$T_C = 25\text{ °C}$	I_D	29	A
	$T_C = 70\text{ °C}$		23	
Pulsed Drain Current ¹		I_{DM}	80	
Avalanche Current		I_{AS}	19	
Avalanche Energy	L = 0.1mH	E_{AS}	19	mJ
Power Dissipation	$T_C = 25\text{ °C}$	P_D	42	W
	$T_C = 70\text{ °C}$		27	
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		3	°C / W
Junction-to-Ambient	$R_{\theta JA}$		62.5	

¹Pulse width limited by maximum junction temperature.

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ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

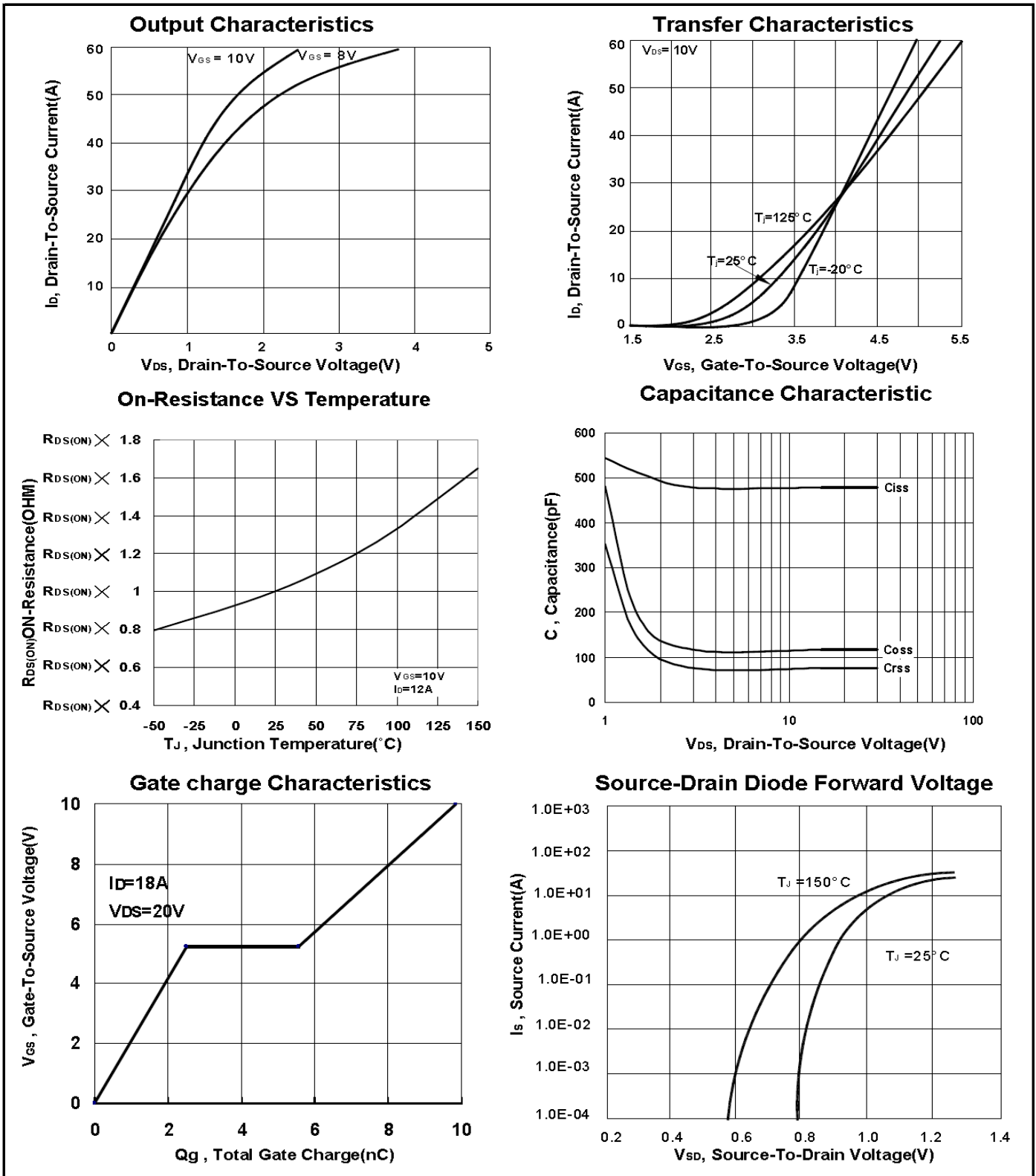
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNITS
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	40			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.7	1.9	3.0	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V			±250	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 32V, V _{GS} = 0V			1	μA
		V _{DS} = 30V, V _{GS} = 0V, T _J = 125 °C			10	
On-State Drain Current ¹	I _{D(ON)}	V _{DS} = 10V, V _{GS} = 10V	80			A
Drain-Source On-State Resistance ¹	R _{DS(ON)}	V _{GS} = 10V, I _D = 18A		25	30	mΩ
		V _{GS} = 7V, I _D = 12A		31	38	
Forward Transconductance ¹	g _{fs}	V _{DS} = 10V, I _D = 10A		25		S
DYNAMIC						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 20V, f = 1MHz		479		pF
Output Capacitance	C _{oss}			117		
Reverse Transfer Capacitance	C _{rss}			76		
Gate Resistance	R _g	V _{GS} = 0V, V _{DS} = 0V, f = 1MHz		1.7		Ω
Total Gate Charge ²	Q _g	V _{DS} = 20V, V _{GS} = 10V, I _D = 18A		10		nC
Gate-Source Charge ²	Q _{gs}			2.8		
Gate-Drain Charge ²	Q _{gd}			3.3		
Turn-On Delay Time ²	t _{d(on)}	V _{DD} = 20V, I _D ≅ 6.7A, V _{GS} = 10V, R _{GEN} = 6Ω		15		nS
Rise Time ²	t _r			10		
Turn-Off Delay Time ²	t _{d(off)}			34		
Fall Time ²	t _f			10		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I _S				29	A
Forward Voltage ¹	V _{SD}	I _F = 18A, V _{GS} = 0V			1.3	V
Reverse Recovery Time	t _{rr}	I _F = 18A, dI _F /dt = 100A / μS		38		nS
Reverse Recovery Charge	Q _{rr}				29	

¹Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

²Independent of operating temperature.

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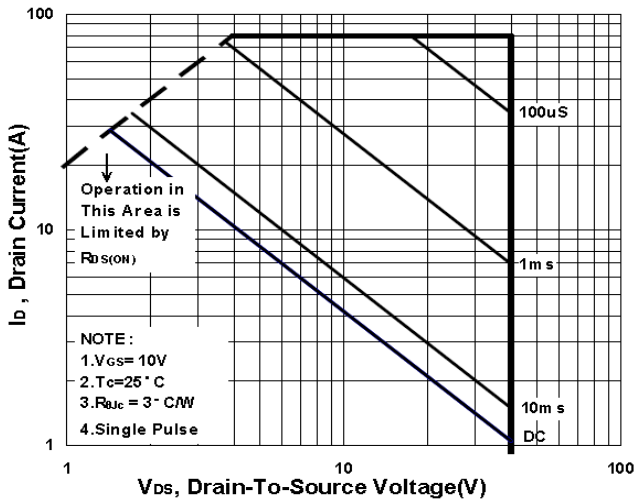
N-Channel Enhancement Mode MOSFET



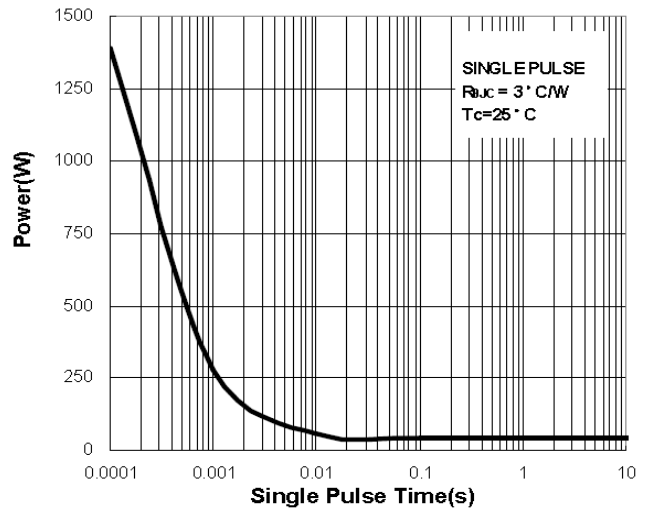
P3004BD

N-Channel Enhancement Mode MOSFET

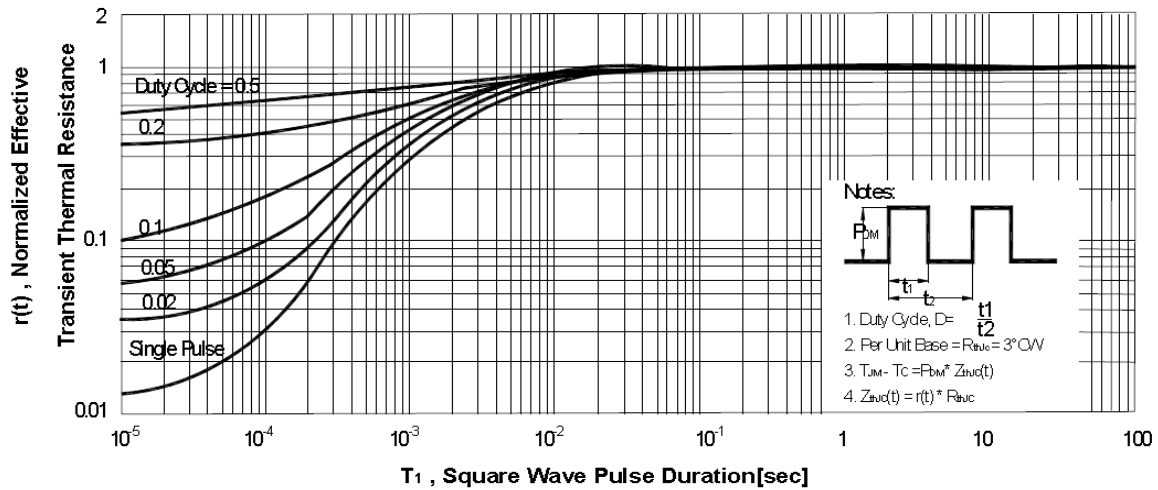
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



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N-Channel Enhancement Mode MOSFET

Figure 1
Gate Charge Test Circuit

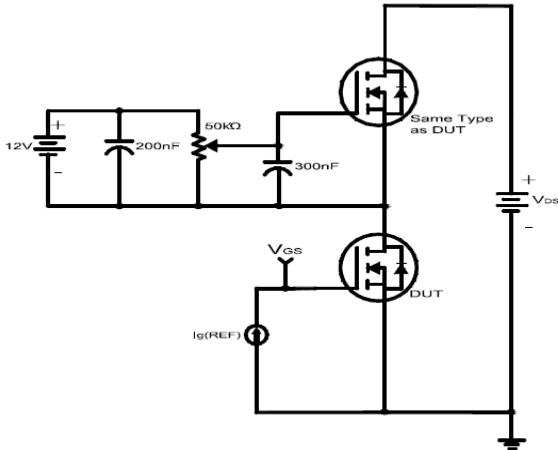


Figure 2
Gate Charge Waveforms

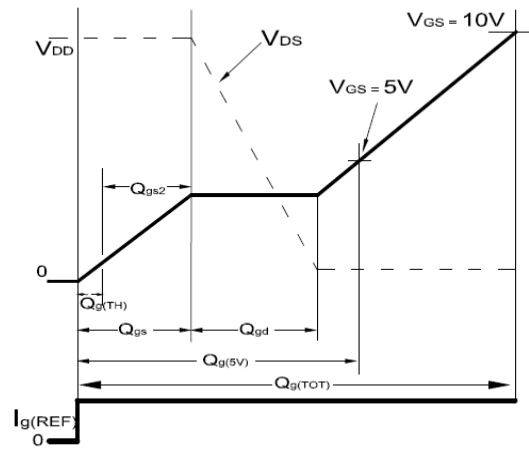


Figure 3
Switching Time Test Circuit

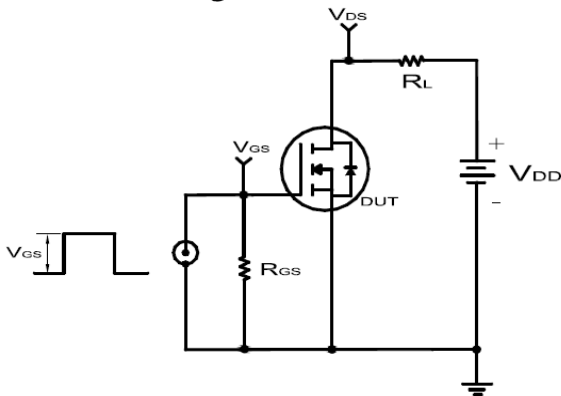


Figure 4
Switching Time Waveforms

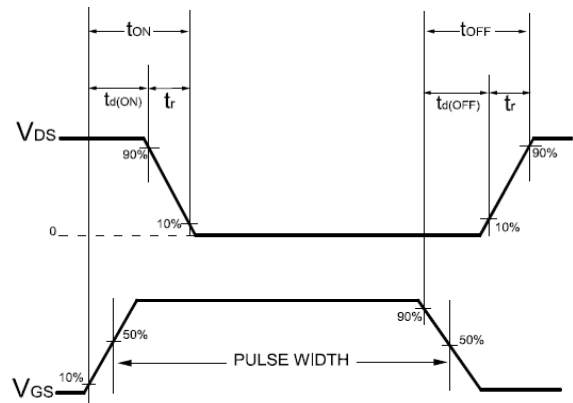


Figure 5
Unclamped Energy Test Circuit

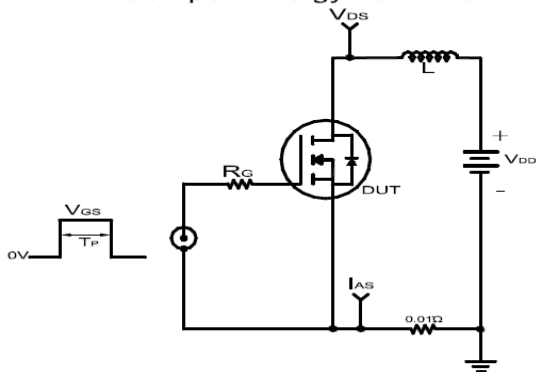
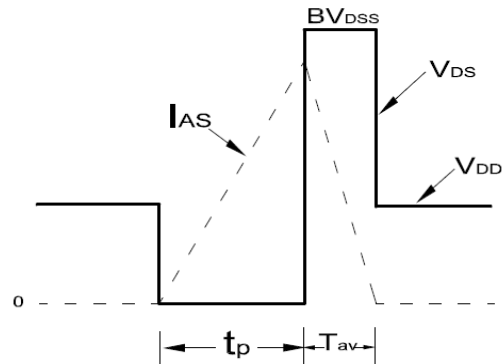


Figure 6
Unclamped Energy Waveforms



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Figure 7
Diode Recovery Test Circuit

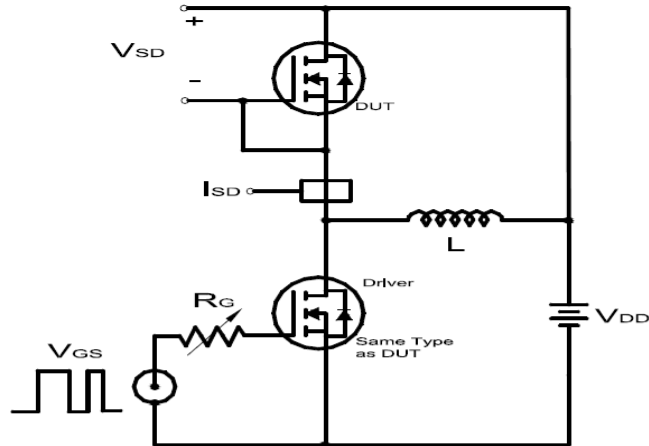
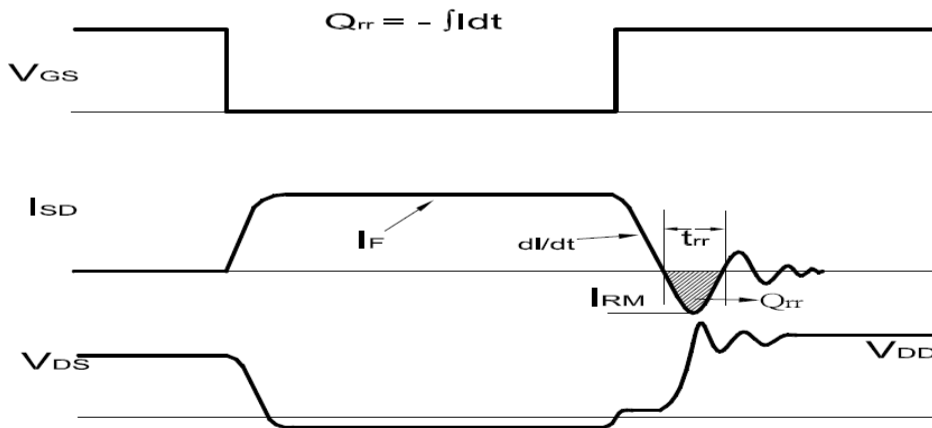


Figure 8
Diode Recovery Test Waveforms



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Package Dimension

TO-252 (DPAK) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	8.9	10	10.41	J	4.8		5.64
B	2.1	2.2	2.5	K	0.15		1.49
C	0.4	0.5	0.61	L	0.4	0.76	0.91
D	0.82	1.2	1.5	M	4.2	4.58	5
E	0.35	0.5	0.65	S	4.57	5.1	5.52
F	0		0.2	T	3.81	4.75	5.24
G	5.3	6.1	6.3	U	1.4		1.78
H	0.5		1.7	V	0.55	1.25	1.7
I	6.3	6.5	6.8				

