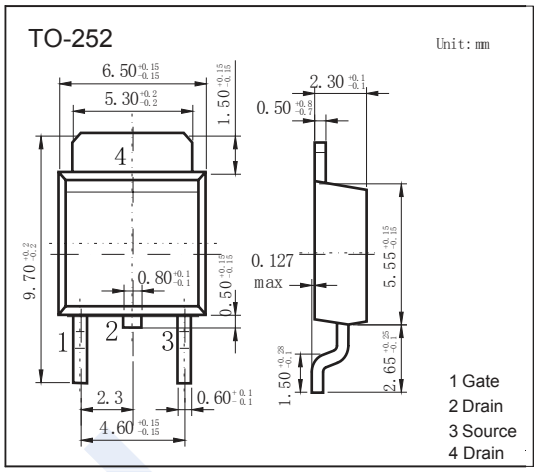
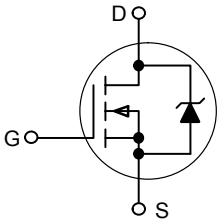
N-Channel MOSFET
NTD6N15



■ Features

- $V_{DS\ (V)}$ = 150V
- I_D = 6 A (V_{GS} = 10V)
- $R_{DS(ON)}$ < 300mΩ (V_{GS} = 10V)
- Silicon Gate for Fast Switching Speeds
- Low Drive Requirement



■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	150	V
Drain−Gate Voltage (R_{GS} = 1mΩ)		V_{DG}	150	
Gate-Source Voltage		V_{GS}	±20	
Gate-Source Voltage-Non−Repetitive		V_{GSM}	±40	
Continuous Drain Current		I_D	6	A
Pulsed Drain Current		I_{DM}	20	
Power Dissipation	Tc=25℃	P_D	20	W
Derate above 25°C			0.16	W/℃
Power Dissipation (Note.1)	Ta=25℃	P_D	1.25	W
Derate above 25°C			0.01	W/℃
Power Dissipation (Note.2)	Ta=25℃	P_D	1.75	W
Derate above 25°C			0.014	W/℃
Thermal Resistance.Junction- to-Ambient	(Note.1)	R_{thJA}	100	℃/W
	(Note.2)		71.4	
Thermal Resistance.Junction- to-Case		R_{thJC}	6.25	
Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{stg}	-65 to 150	

Note.1: When surface mounted to an FR4 board using the minimum recommended pad size.

Note.2: When surface mounted to an FR4 board using 0.5 sq. in. drain pad size.

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■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=250uA, V_{GS}=0V	150			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=Rated V_{DSS}, V_{GS}=0V			10	uA
		V_{DS}=Rated V_{DSS}, V_{GS}=0V, T_J = 25℃			100	
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} , I_D=1mA	2		4.5	V
		V_{DS}=V_{GS} , I_D=1mA , T_J = 100℃	1.5		4	
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=3A			300	mΩ
Drain−Source On−Voltage	$V_{DS(ON)}$	V_{GS}=10V, I_D=6A			1.8	V
		V_{GS}=10V, I_D=3A , T_J = 100℃			1.5	
Forward Transconductance	g_{FS}	V_{DS}=15V, I_D=3A	2.5			S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz			1200	pF
Output Capacitance	C_{oss}				500	
Reverse Transfer Capacitance	C_{rss}				120	
Total Gate Charge	Q_g	V_{GS}=10V, V_{DS}=0.8Rated V_{DSS}, I_D=Rated I_D			30	nC
Gate Source Charge	Q_{gs}			8		
Gate Drain Charge	Q_{gd}			7		
Turn-On DelayTime	$t_{d(on)}$	V_{DS}=25V, I_D=3A,R_G=50Ω			50	ns
Turn-On Rise Time	t_r				180	
Turn-Off DelayTime	$t_{d(off)}$				200	
Turn-Off Fall Time	t_f				100	
Reverse Recovery Time	t_{rr}	I_F= 6A, di/dt=25A/us,V_{GS}=0V		325		
Continuous Drain-Source Diode Forward Current	I_S				6	A
Diode Forward Voltage	V_{SD}	I_S=6A,V_{GS}=0V			2	V

■ Typical Characterisitics

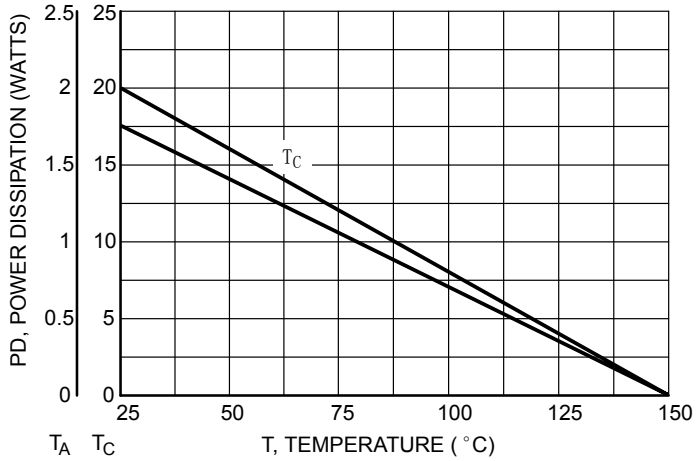

Figure 1. Power Derating

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■ Typical Characterisitics

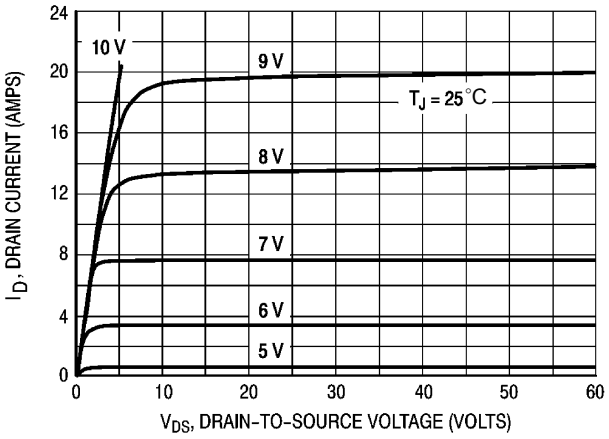

Figure 2. On−Region Characteristics

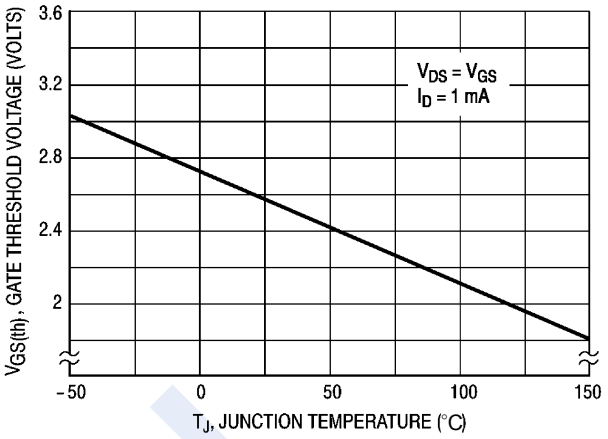

Figure 3. Gate−Threshold Voltage Variation With Temperature

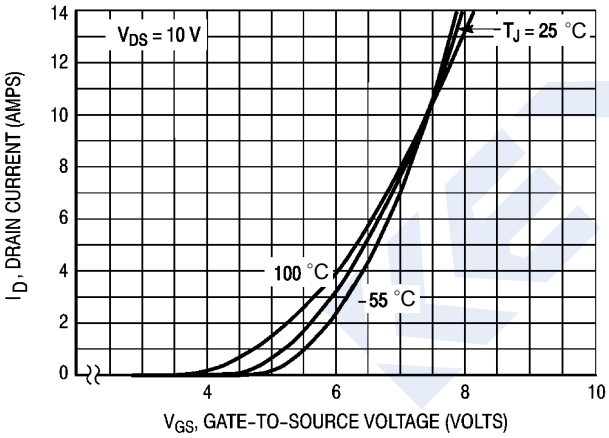

Figure 4. Transfer Characteristics

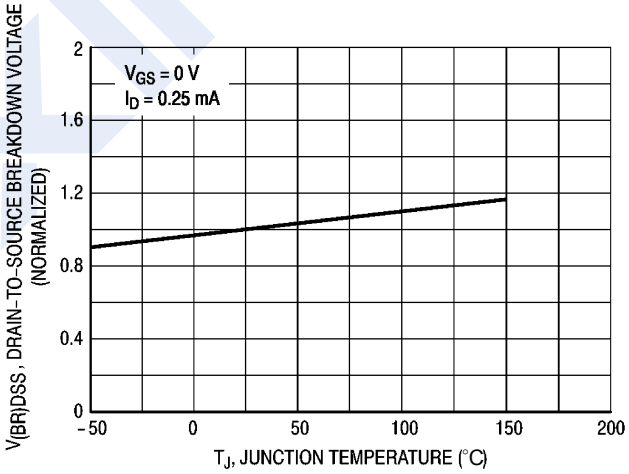

Figure 5. Breakdown Voltage Variation With Temperature

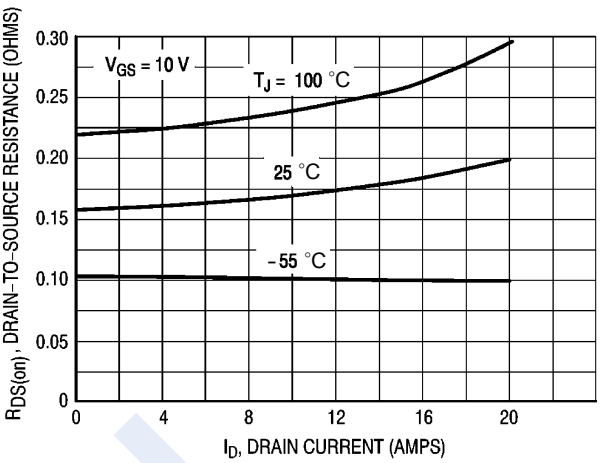

Figure 6. On−Resistance versus Drain Current

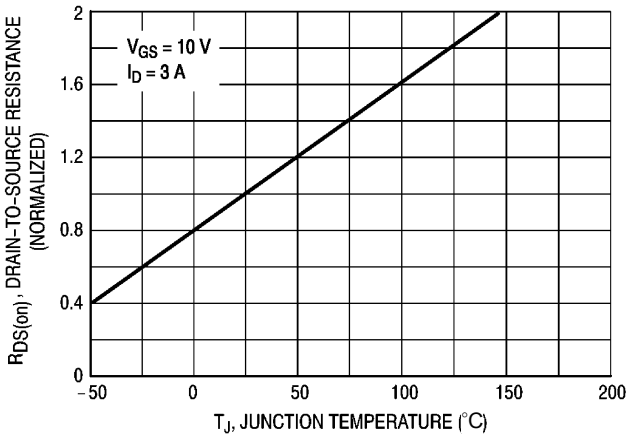

Figure 7. On−Resistance Variation With Temperature

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■ Typical Characterisitics

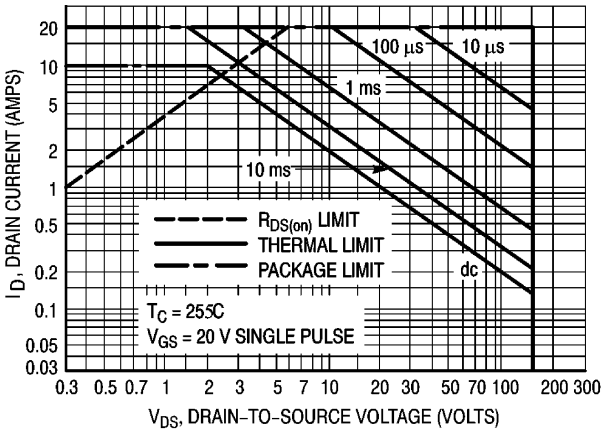

Figure 8. Maximum Rated Forward Biased Safe Operating Area

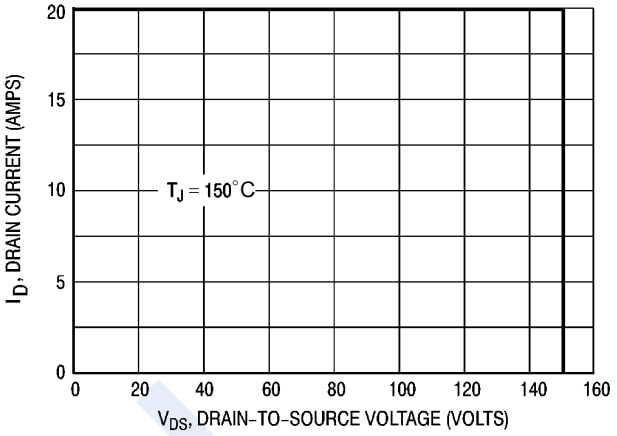

Figure 9. Maximum Rated Switching Safe Operating Area

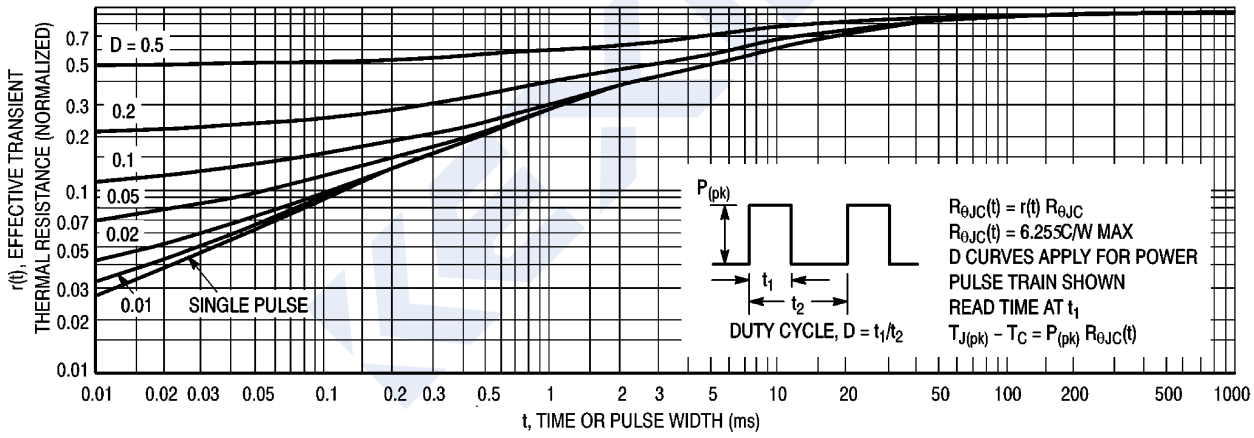

Figure 10. Thermal Response

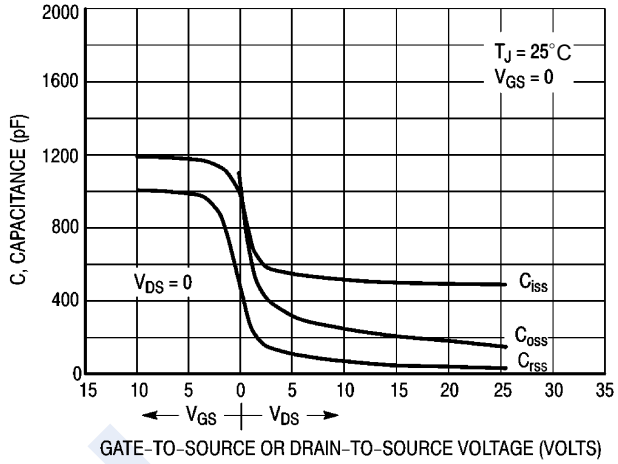

Figure 11. Capacitance Variation

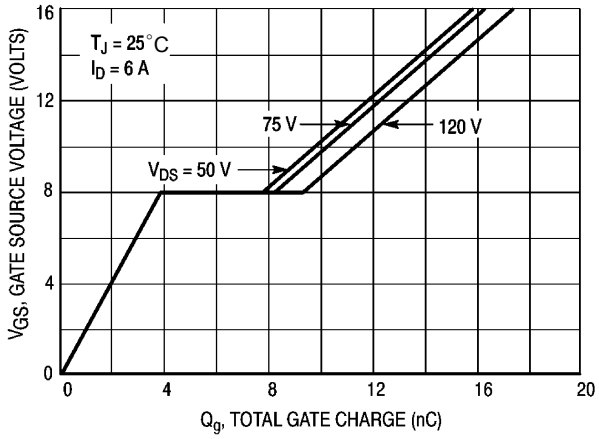

Figure 12. Gate Charge versus Gate−To−Source Voltage

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■ Typical Characterisitics

RESISTIVE SWITCHING

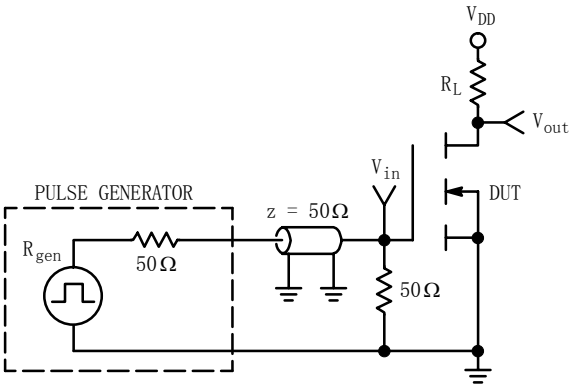

Figure 13. Switching Test Circuit

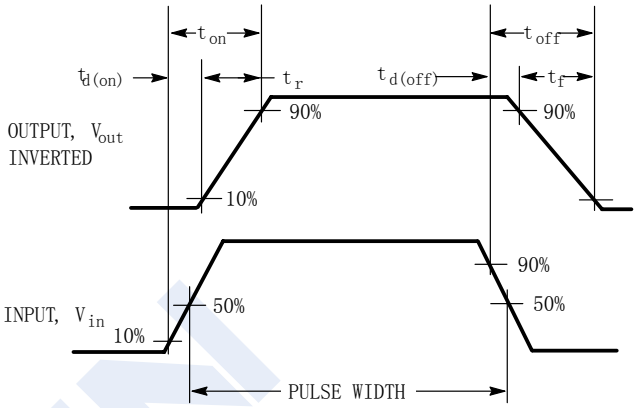

Figure 14. Switching Waveforms