
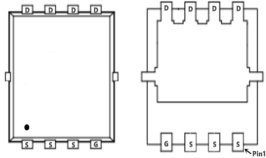


**TM55P03DF**

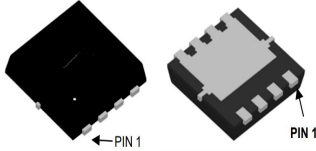
**P -Channel Enhancement Mosfet**

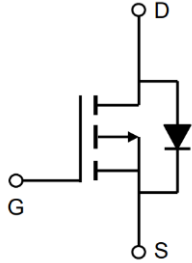
<p><b>General Description</b></p> <ul style="list-style-type: none"> <li>• Low R<sub>DS(ON)</sub></li> <li>• RoHS and Halogen-Free Compliant</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>• Load switch</li> <li>• PWM</li> </ul>	<p><b>General Features</b></p> <p>V<sub>DS</sub> = -30V I<sub>D</sub> = -55A  R<sub>DS(ON)</sub> = 8.5mΩ (typ.) @ V<sub>GS</sub> = -10V</p> <p>100% UIS Tested  100% R<sub>g</sub> Tested</p> 
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DF:DFN3x3\_8L



Marking:3419A





**Absolute Maximum Ratings (T<sub>A</sub> = 25°C, unless otherwise noted)**

Symbol	Parameter	Max.	Units
V <sub>DSS</sub>	Drain-Source Voltage	-30	V
V <sub>GSS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current	T <sub>C</sub> = 25°C	-55
		T <sub>C</sub> = 100°C	-29
I <sub>DM</sub>	Pulsed Drain Current <sup>note1</sup>	-150	A
E <sub>AS</sub>	Single Pulsed Avalanche Energy <sup>note2</sup>	78.8	mJ
P <sub>D</sub>	Power Dissipation	T <sub>C</sub> = 25°C	21.5
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	5.8	°C/W
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +150	°C

**Electrical Characteristics** ( $T_J=25^{\circ}\text{C}$  unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D = -250\mu A$	-30	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = -30V, V_{GS} = 0V,$	-	-	-1	$\mu A$
$I_{GSS}$	Gate to Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.0	-1.5	-2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>note3</small>	$V_{GS} = -10V, I_D = -12A$	-	8.5	11	m $\Omega$
		$V_{GS} = -4.5V, I_D = -8A$	-	12	17	
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS} = -15V, V_{GS} = 0V,$ $f = 1.0MHz$	-	1800	-	pF
$C_{oss}$	Output Capacitance		-	346	-	pF
$C_{rss}$	Reverse Transfer Capacitance		-	319	-	pF
$Q_g$	Total Gate Charge	$V_{DS} = -15V, I_D = -20A,$ $V_{GS} = -10V$	-	30	-	nC
$Q_{gs}$	Gate-Source Charge		-	5.3	-	nC
$Q_{gd}$	Gate-Drain("Miller") Charge		-	7.6	-	nC
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = -15V, I_D = -20A,$ $V_{GS} = -10V, R_{GEN} = 2.5\Omega$	-	14	-	ns
$t_r$	Turn-on Rise Time		-	20	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	95	-	ns
$t_f$	Turn-off Fall Time		-	65	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	-55	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-140	A
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_S = -35A$	-	-0.8	-1.2	V

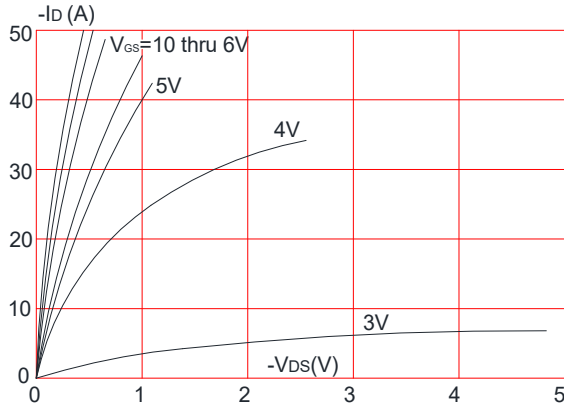
Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

 2. EAS condition:  $T_J = 25^{\circ}\text{C}$ ,  $V_{DD} = -20V$ ,  $V_G = -10V$ ,  $L = 0.5mH$ ,  $R_G = 25\Omega$ ,  $I_{AS} = -17A$ 

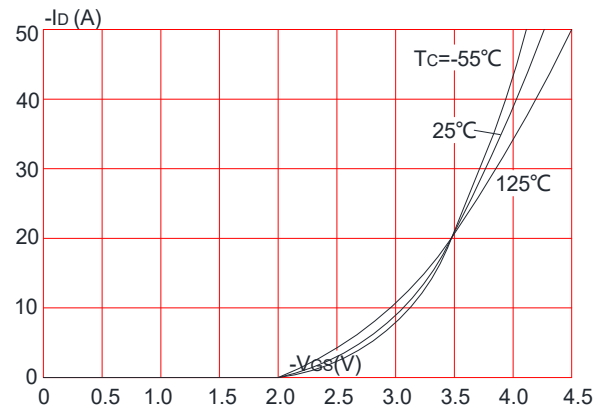
 3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$

## Typical Performance Characteristics

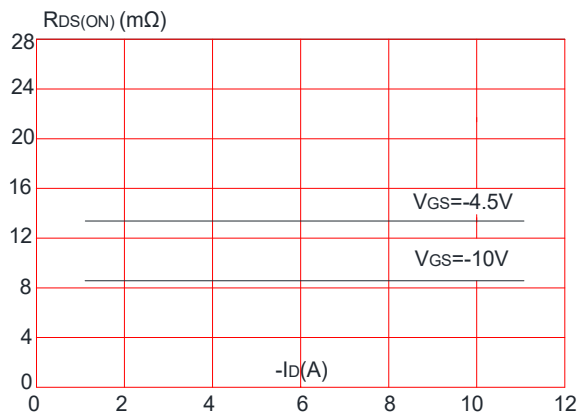
**Figure 1: Output Characteristics**



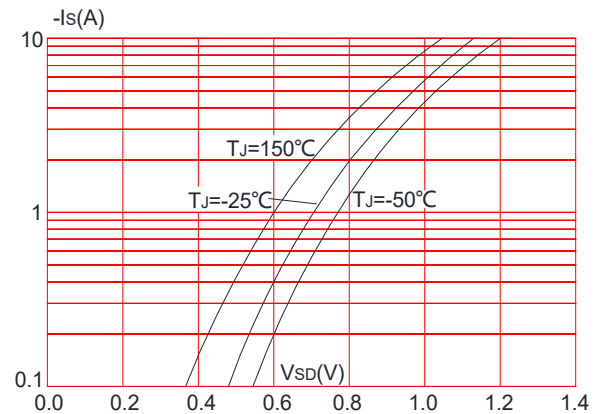
**Figure 2: Typical Transfer Characteristics**



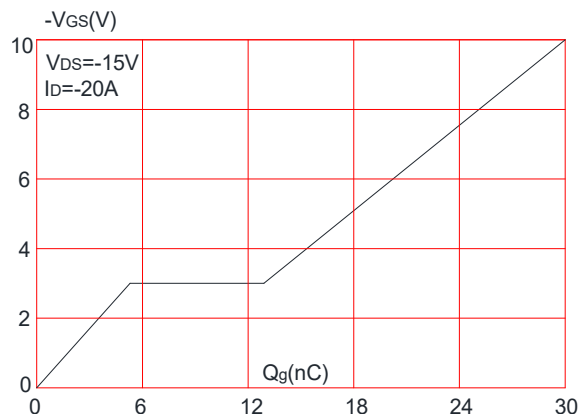
**Figure 3: On-resistance vs. Drain Current**



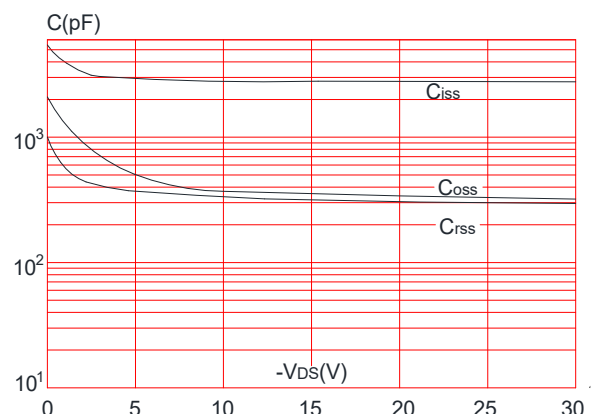
**Figure 4: Body Diode Characteristics**



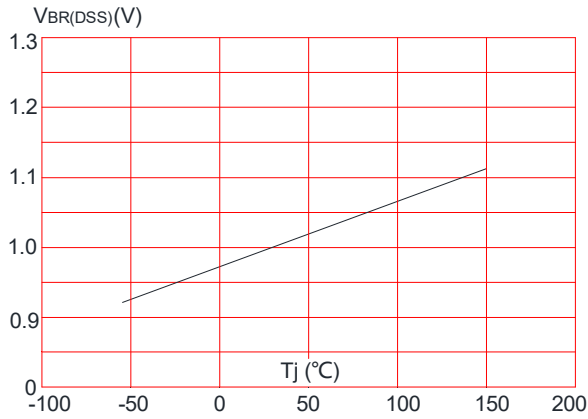
**Figure 5: Gate Charge Characteristics**



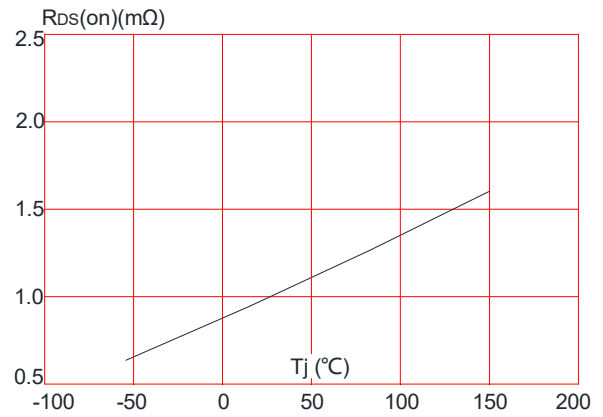
**Figure 6: Capacitance Characteristics**



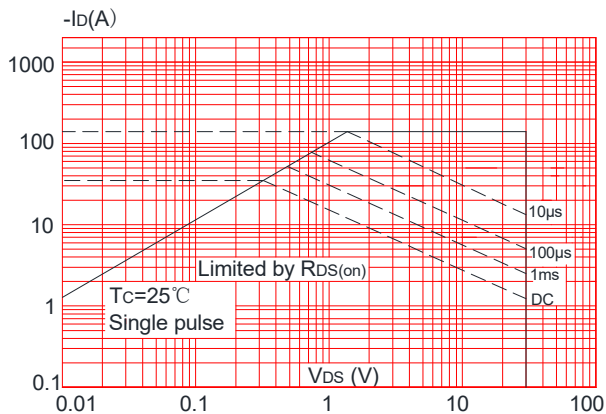
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



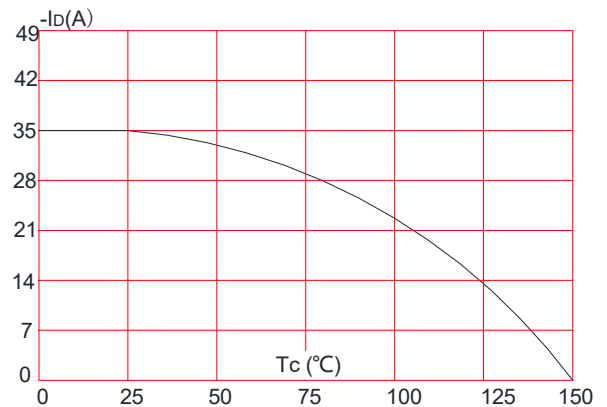
**Figure 8:** Normalized on Resistance vs. Junction Temperature



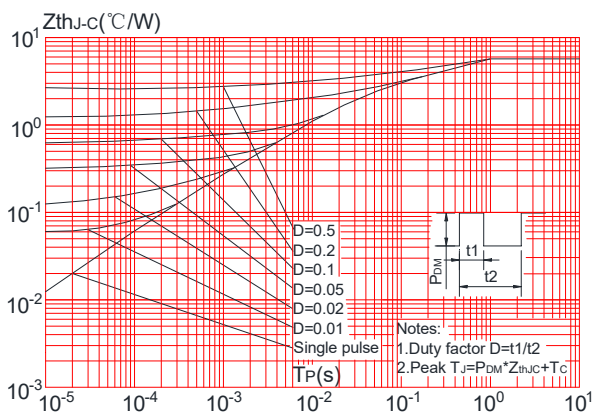
**Figure 9:** Maximum Safe Operating Area



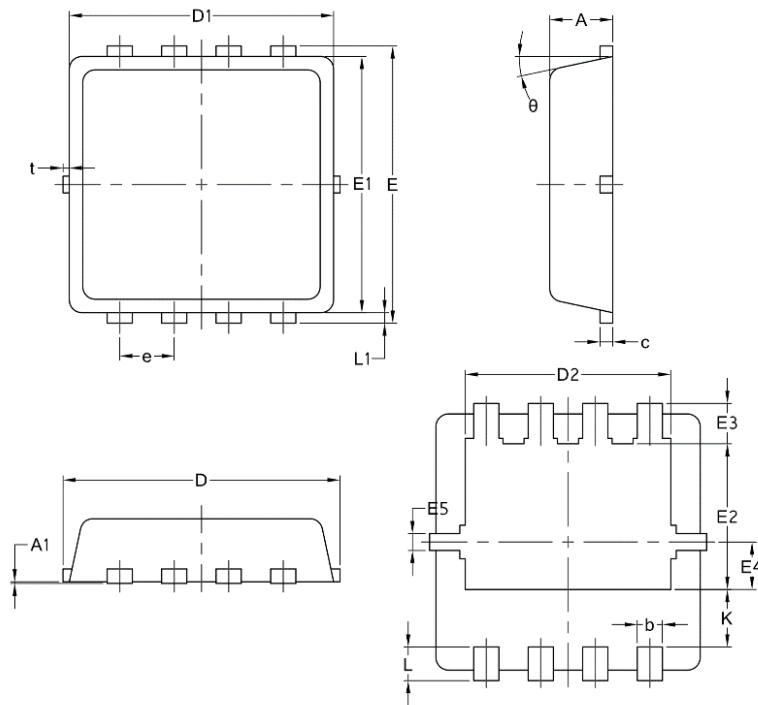
**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature



**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case



## Package Mechanical Data:DFN3x3-8L



Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.30	3.45
D1	3.00	3.15	3.25
D2	2.29	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
E3	0.28	0.48	0.65
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.59	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	0	0.075	0.13
$\Phi$	10	12	14