



TM55P03NF

P-Channel Enhancement Mosfet

General Description

- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

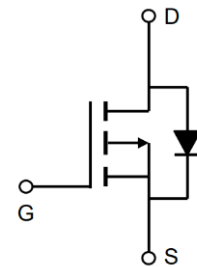
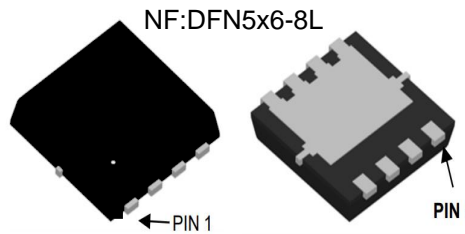
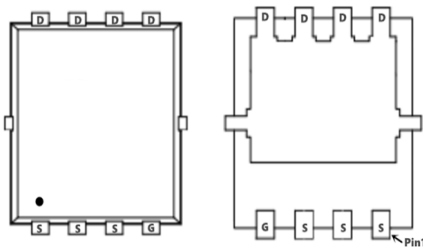
Applications

- Load switch
- PWM

General Features

$V_{DS} = -30V$ $I_D = -55A$
 $R_{DS(ON)} = 8.3m\Omega(typ.) @ V_{GS} = -10V$

100% UIS Tested
 100% R_g Tested



Marking: 55P03 OR 7401

Absolute Maximum Ratings ($T_A = 25^\circ C$ Unless Otherwise Noted)

Symbol	Parameter	Max.	Units	
V_{DSS}	Drain-Source Voltage	-30	V	
V_{GSS}	Gate-Source Voltage	± 20	V	
I_D	Continuous Drain Current	$T_C = 25^\circ C$	-55	A
		$T_C = 100^\circ C$	-23	A
I_{DM}	Pulsed Drain Current ^{note1}	-140	A	
E_{AS}	Single Pulsed Avalanche Energy ^{note2}	78.8	mJ	
P_D	Power Dissipation	$T_C = 25^\circ C$	21.5	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	5.8	$^\circ C/W$	
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ C$	



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Electrical Characteristics (T_J=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D = -250μA	-30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -30V, V _{GS} = 0V,	-	-	-1	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-1.0	-1.5	-2.5	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	V _{GS} = -10V, I _D = -12A	-	8.3	11	mΩ
		V _{GS} = -4.5V, I _D = -8A	-	13	18	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = -15V, V _{GS} = 0V, f = 1.0MHz	-	2800	-	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
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} = -15V, I _D = -20A, V _{GS} =-10V, R _{GEN} =2.5Ω	-	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
Drain-Source Diode Characteristics and Maximum Ratings						
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°C, V_{DD}= -20V, V_G= -10V, L= 0.5mH, R_G= 25 Ω, I_{AS}= -17A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

Typical Performance Characteristics

Figure 1: Output Characteristics

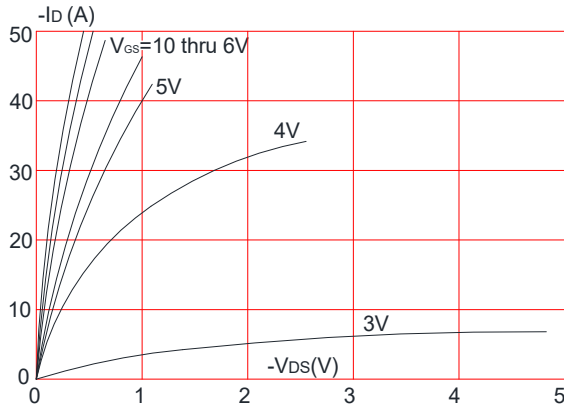


Figure 2: Typical Transfer Characteristics

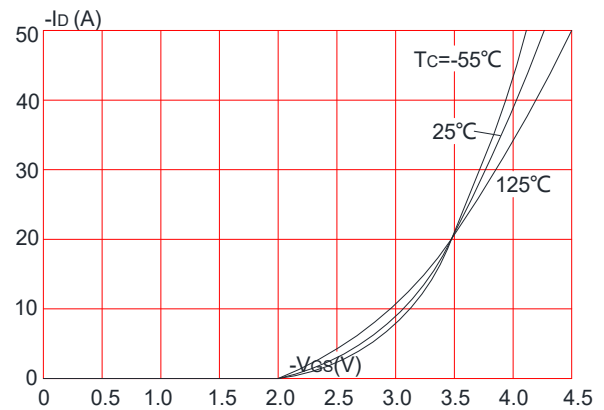


Figure 3: On-resistance vs. Drain Current

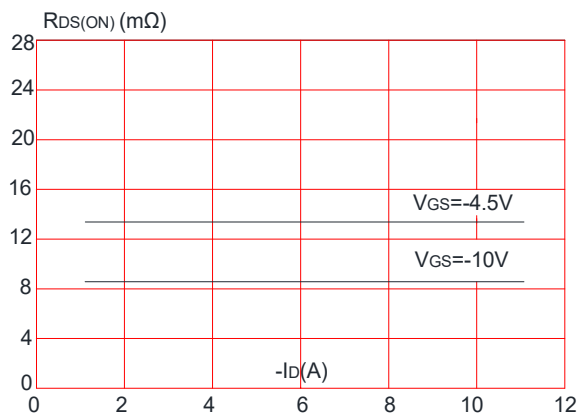


Figure 4: Body Diode Characteristics

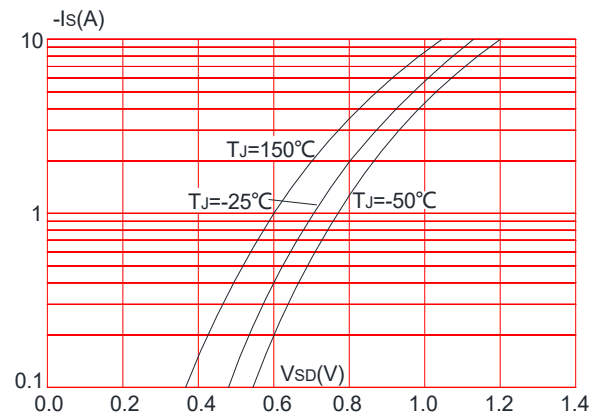


Figure 5: Gate Charge Characteristics

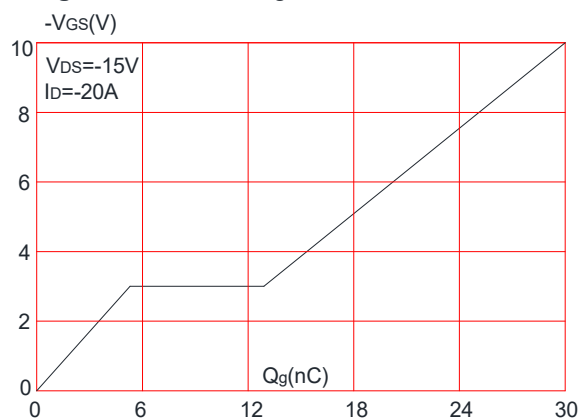
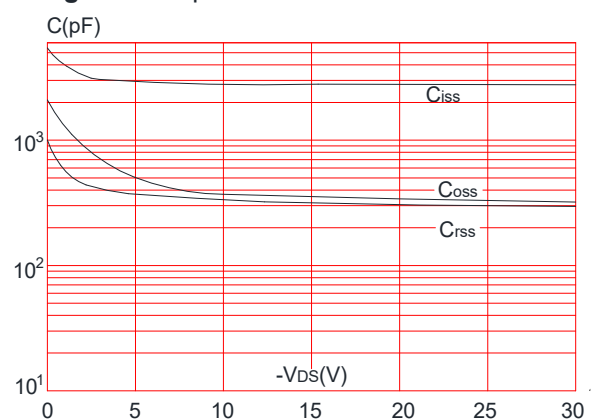


Figure 6: Capacitance Characteristics





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Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

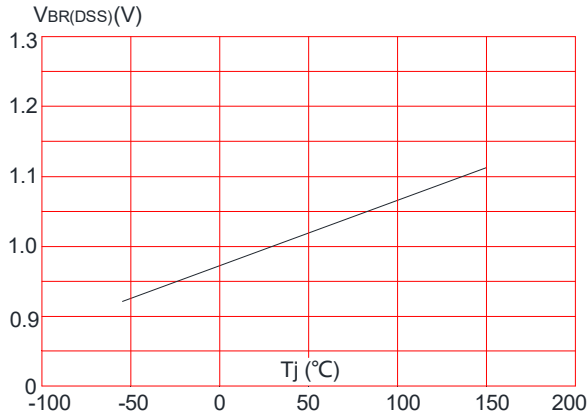


Figure 8: Normalized on Resistance vs. Junction Temperature

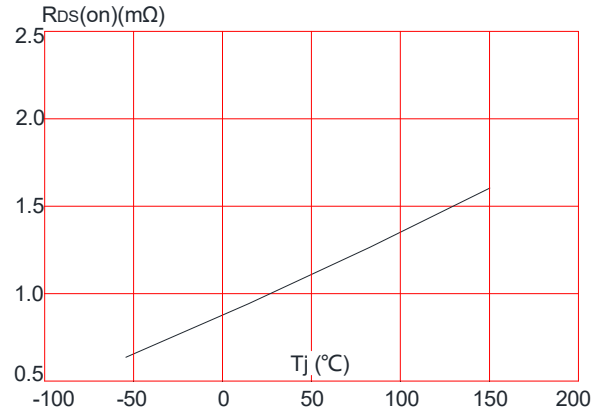


Figure 9: Maximum Safe Operating Area

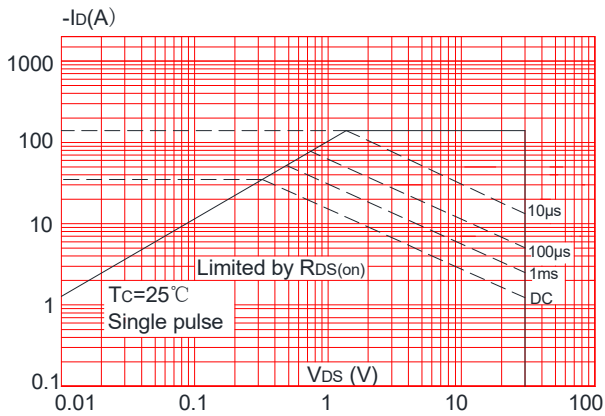


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

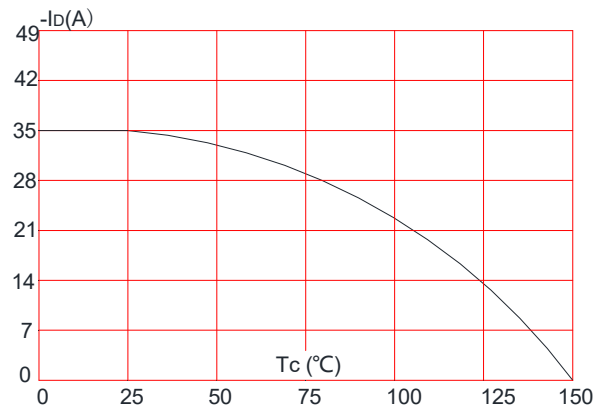
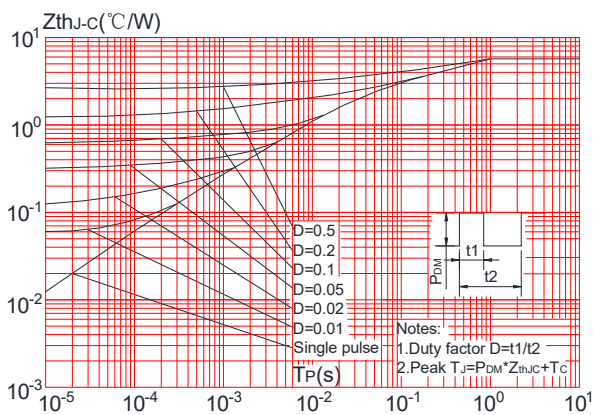
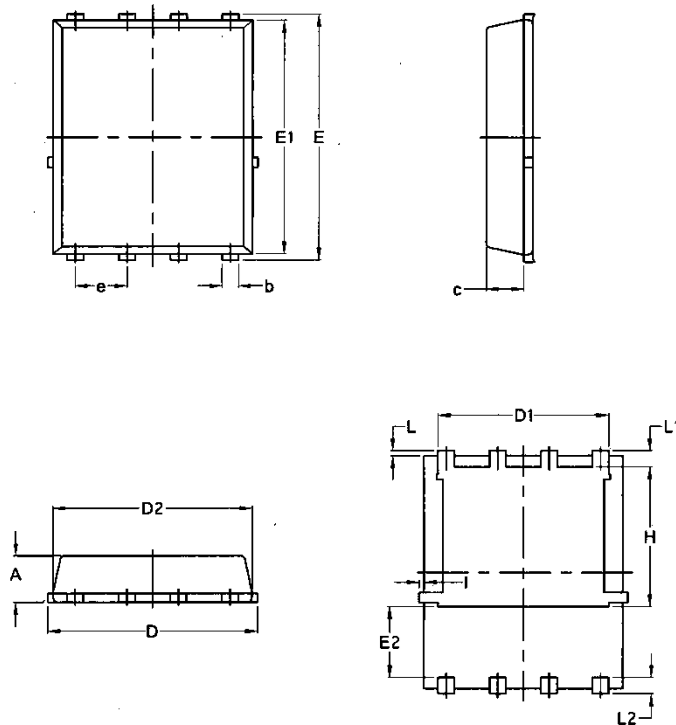


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Package Mechanical Data: DFN5x6-8L



Symbol	Common			
	mm		Inch	
	Min	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070