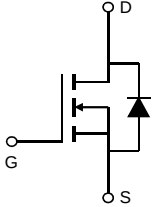
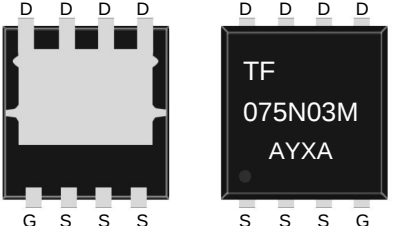


N-Channel Enhancement Mode Power MOSFET

Features • 30V/30A • $R_{DS(ON)} = 7.5m\Omega(Typ.)@V_{GS}=10V$ • $R_{DS(ON)} = 9.3m\Omega(Typ.)@V_{GS}=4.5V$ • Super High Dense Cell Design • Fast Switching Speed • Low gate Charge • 100% avalanche tested • Lead Free and Green Devices Available Applications • Switching Application Systems	Schematic diagram  PDFN 3333 
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Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
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Common Ratings ($T_C=25^\circ\text{C}$ 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	30	A

Mounted on Large Heat Sink

$I_{DP}^{①}$	300 μs Pulse Drain Current Tested	$T_C=25^\circ\text{C}$	100	A
$I_D^{②}$	Continuous Drain Current@ $T_C(V_{GS}=10V)$	$T_C=25^\circ\text{C}$	30	A
	Continuous Drain Current@ $T_A(V_{GS}=10V)^{③}$	$T_A=25^\circ\text{C}$	9.8	
P_D	Maximum Power Dissipation@ T_C	$T_C=25^\circ\text{C}$	30	W
	Maximum Power Dissipation@ $T_A^{④}$	$T_A=25^\circ\text{C}$	3.8	

Notes:

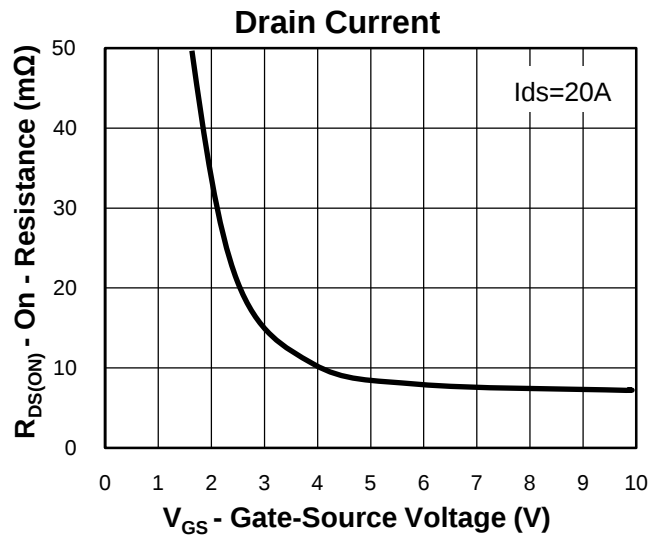
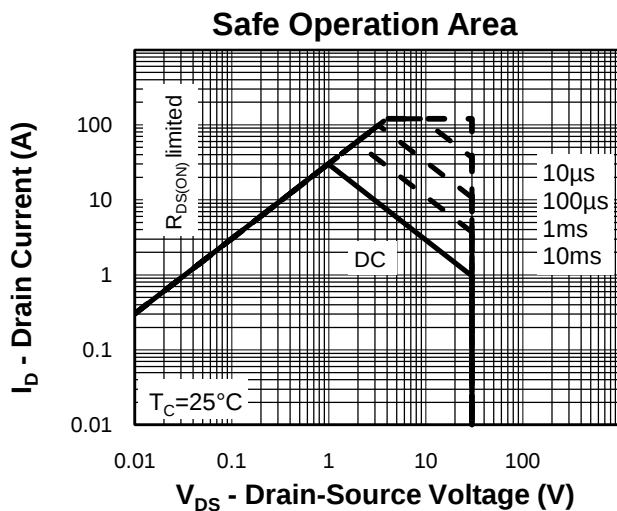
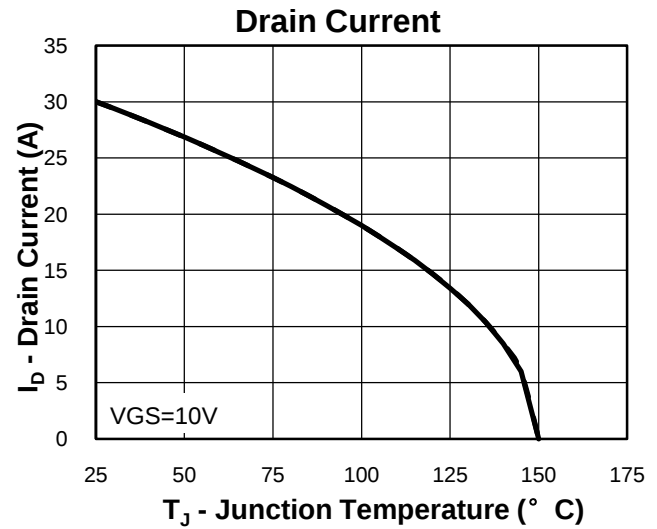
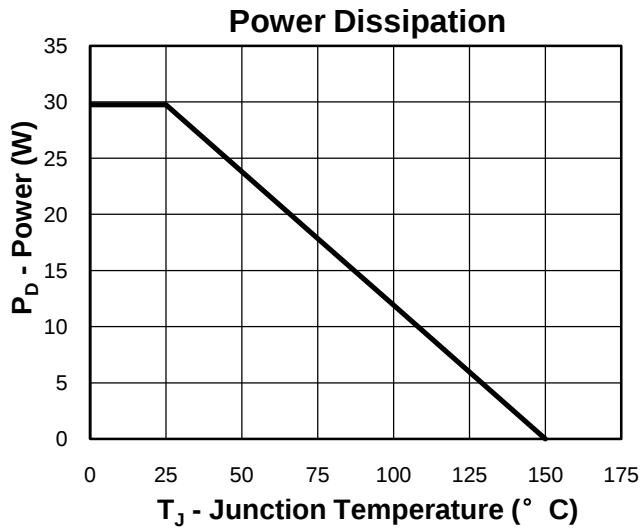
- ①Pulse width limited by safe operating area.
- ②Calculated continuous current based on maximum allowable junction temperature.
- ③When mounted on 1 inch square copper board, $t \leq 10\text{sec}$.
- ④Limited by T_{Jmax} , $I_{AS} = 13A$, $V_{DD} = 24V$, $R_G = 50\Omega$, Starting $T_J = 25^\circ\text{C}$.
- ⑤Pulse test; Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- ⑥Guaranteed by design, not subject to production testing.

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	4.5	°C/W
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	37	°C/W
Drain-Source Avalanche Ratings			
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	30	mJ

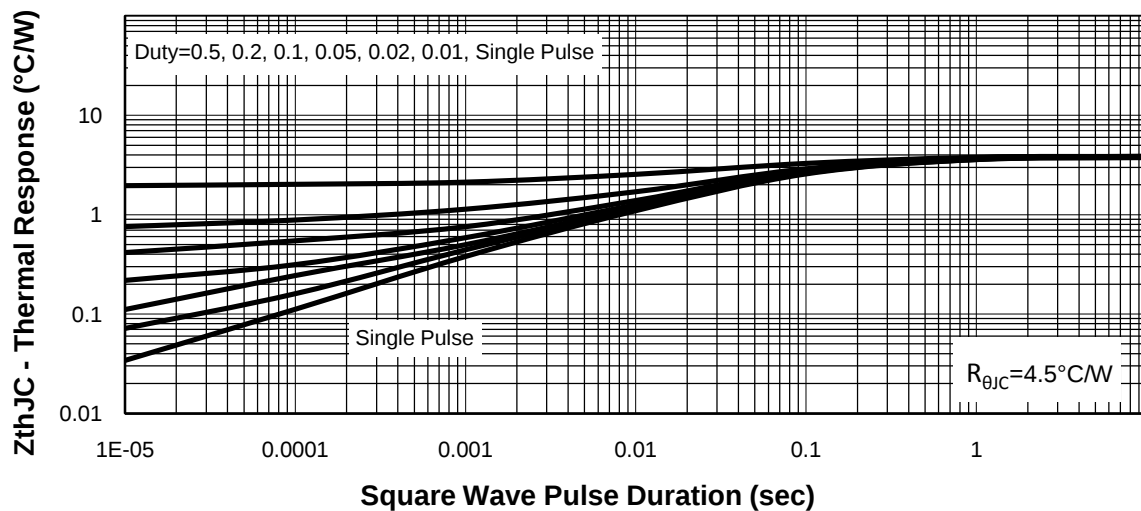
Electrical Characteristics ($T_C=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
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} =30V, V _{GS} =0V			1	μA
		T _J =125°C			30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.2	1.4	2.2	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA
R _{DS(ON)} ^⑤	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =20A		7.5	9.0	mΩ
		V _{GS} =4.5V, I _{DS} =15A		9.3	12	mΩ
Diode Characteristics						
V _{SD} ^⑤	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V			1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =20A, dI _{SD} /dt=100A/μs		13		ns
Q _{rr}	Reverse Recovery Charge			8		nC
Dynamic Characteristics ^⑥						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		1		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz		1007		pF
C _{oss}	Output Capacitance			128		
C _{rss}	Reverse Transfer Capacitance			117		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _L =0.75Ω, I _{DS} =20A, V _{GEN} =10V, R _G =3Ω		5.7		ns
t _r	Turn-on Rise Time			47		
t _{d(OFF)}	Turn-off Delay Time			31		
t _f	Turn-off Fall Time			23		
Gate Charge Characteristics ^⑥						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V , I _{DS} =20A		23		nC
Q _{gs}	Gate-Source Charge			4.2		
Q _{gd}	Gate-Drain Charge			4.3		

Typical Characteristics

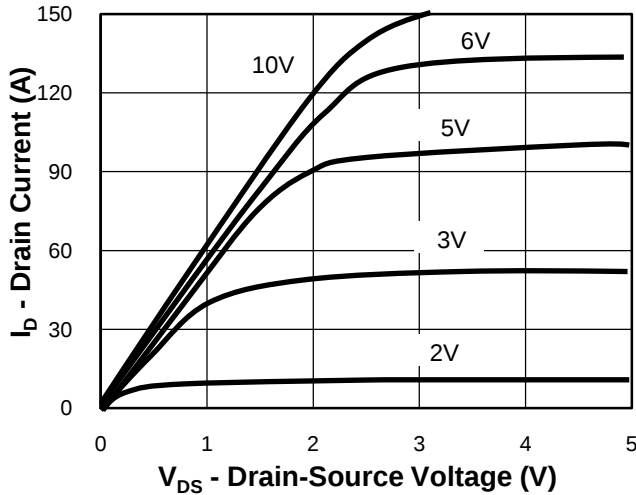


Thermal Transient Impedance

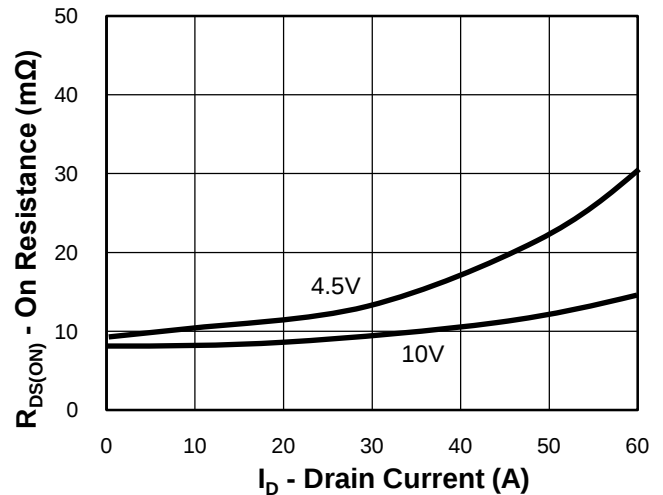


Typical Characteristics

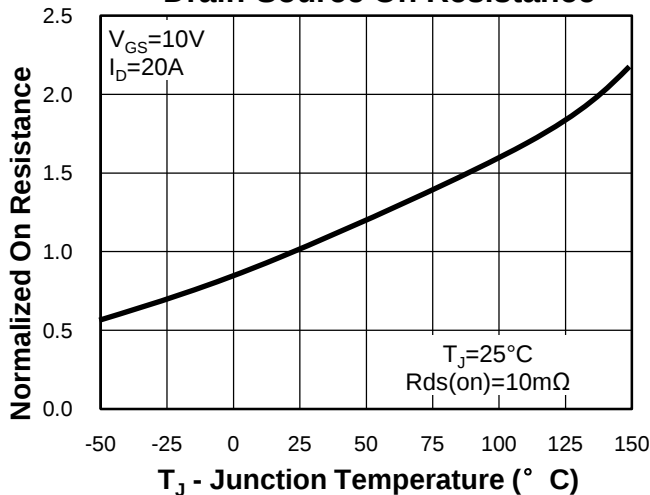
Output Characteristics



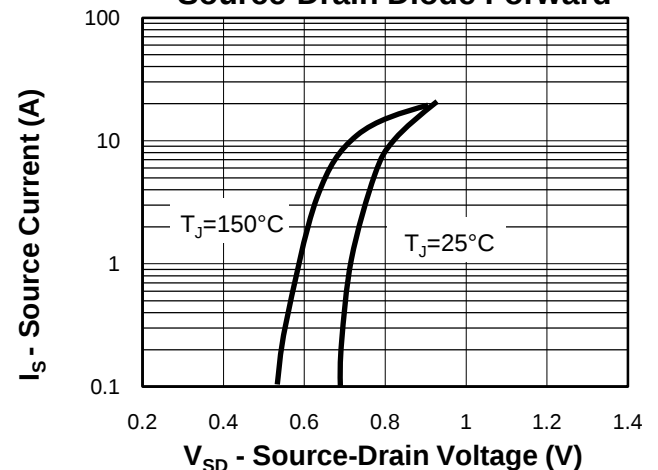
Drain-Source On Resistance



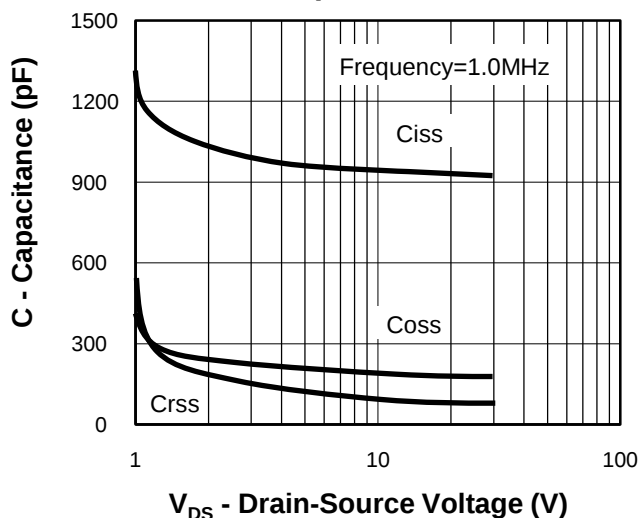
Drain-Source On Resistance



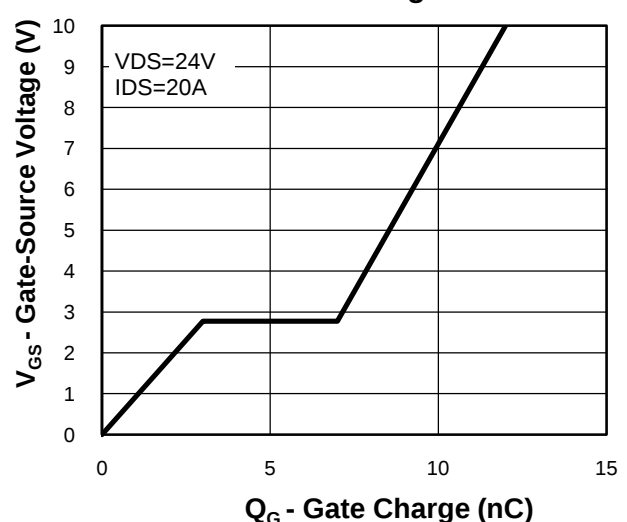
Source-Drain Diode Forward



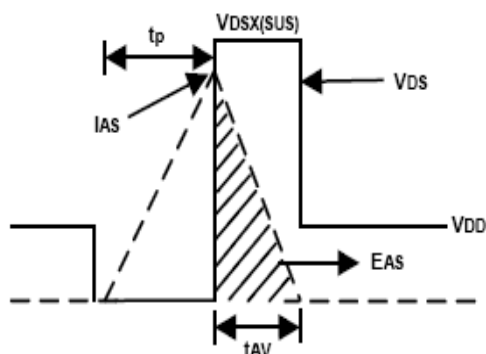
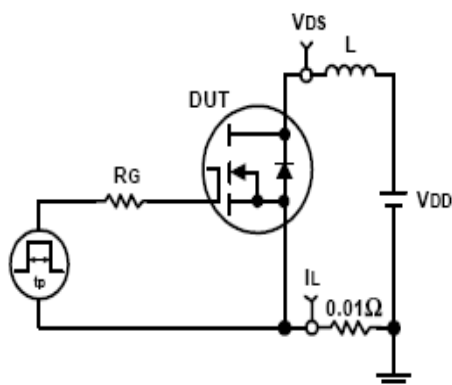
Capacitance



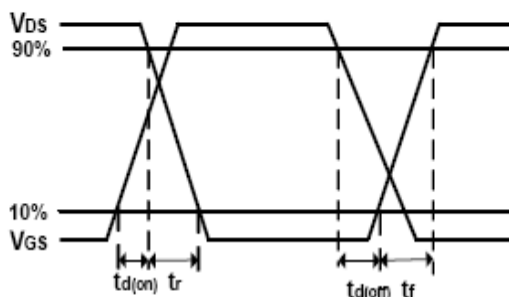
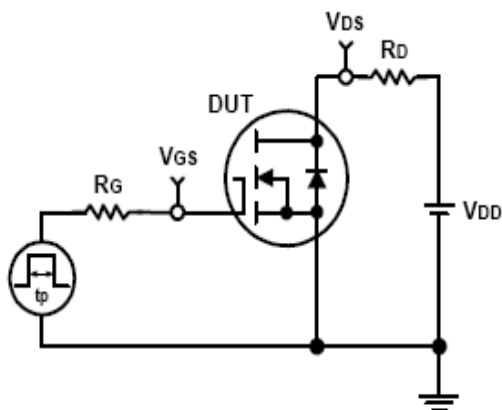
Gate Charge



Avalanche Test Circuit and Waveforms

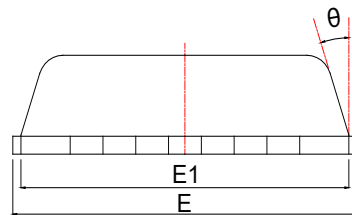
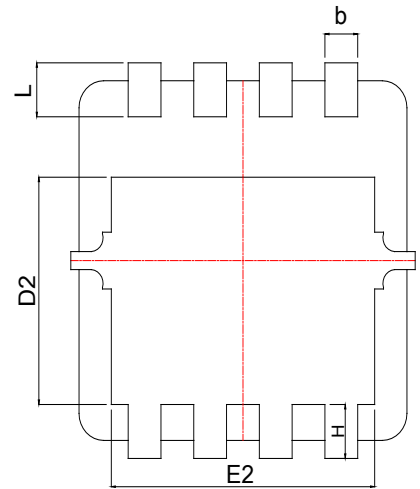
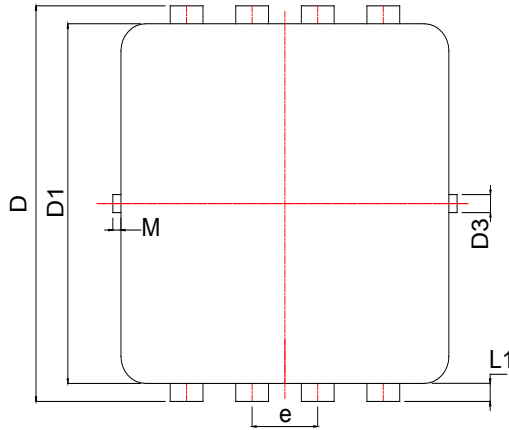
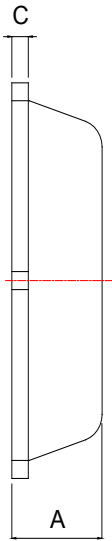


Switching Time Test Circuit and Waveforms

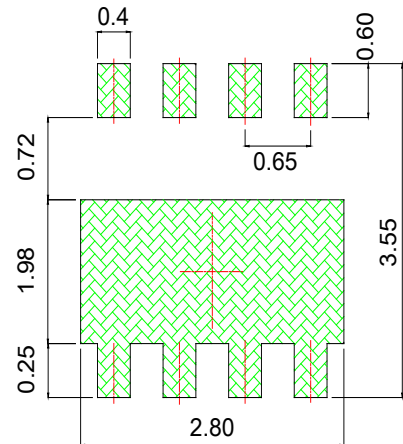


Package Information

PDFN3333



Land Pattern
(Only for Reference)



SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031	E1	3.00	3.15	3.20	0.118	0.122	0.126
b	0.25	0.30	0.35	0.010	0.012	0.014	E2	2.39	2.49	2.59	0.094	0.098	0.102
c	0.10	0.15	0.25	0.004	0.007	0.010	e	0.65BSC			0.026BSC		
D	3.25	3.35	3.45	0.128	0.132	0.136	H	0.30	0.40	0.50	0.012	0.016	0.020
D1	3.00	3.10	3.20	0.118	0.122	0.126	L	0.30	0.40	0.50	0.012	0.016	0.020
D2	1.78	1.88	1.98	0.070	0.074	0.078	L1	*	0.13	*	*	0.005	*
D3	*	0.13	*	*	0.005	*	θ	*	10°	12°	*	10°	12°
E	3.20	3.30	3.40	0.126	0.130	0.134	M	*	*	0.15	*	*	0.006