



FEATURES

- Trench Power DTMOS Technology
- Low $R_{DS(ON)}$
- Low Gate Charge
- Optimized for Fast-switching Applications

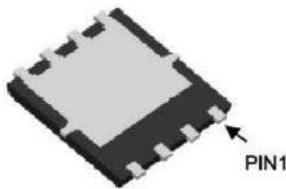
APPLICATIONS

- Synchronous Rectification in DC/DC and AC/DC Converters
- Isolated DC/DC Converters in Telecom and Industrial

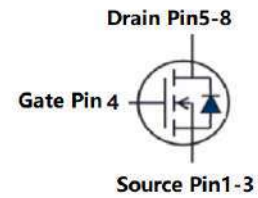
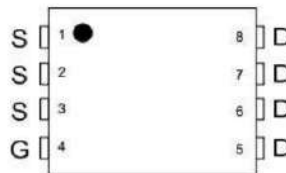
Product Summary

V_{DSS}	60	V
$R_{DS(ON)-Typ@VGS=10V}$	6.5	m Ω
I_D	64	A

Top View



DFN5*6-8



N-Channel

Absolute Maximum Ratings $T_C = 25^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage ($V_{GS} = 0V$)	V_{DSS}	60	V
Continuous Drain Current	I_D	64	A
Pulsed Drain Current (note1)	I_{DM}	256	A
Gate-Source Voltage	V_{GSS}	± 20	V
Single Pulse Avalanche Energy (note2)	E_{AS}	65	mJ
Avalanche Current (note1)	I_{AS}	36	A
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	56.5	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	$^\circ\text{C}$

Thermal Resistance

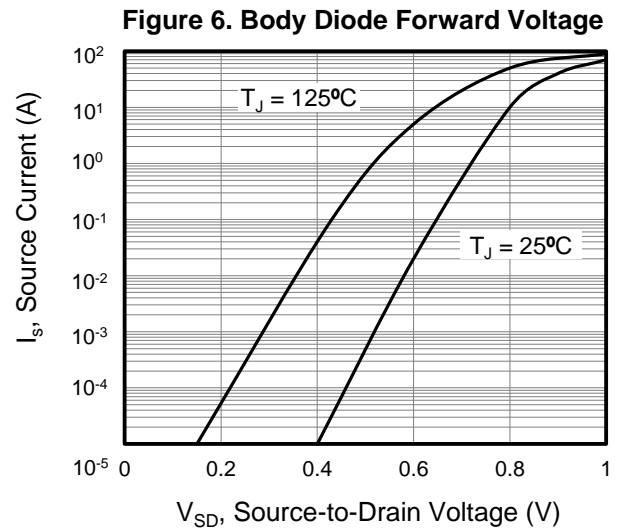
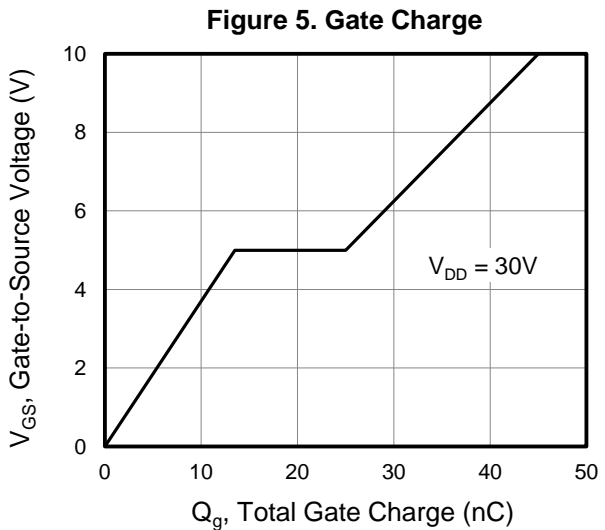
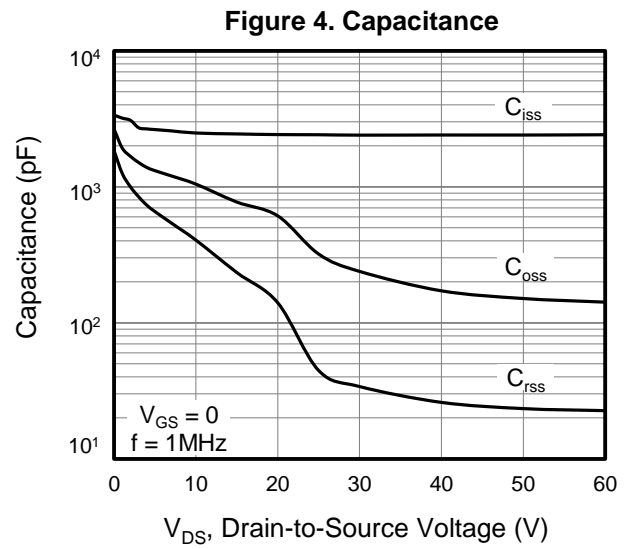
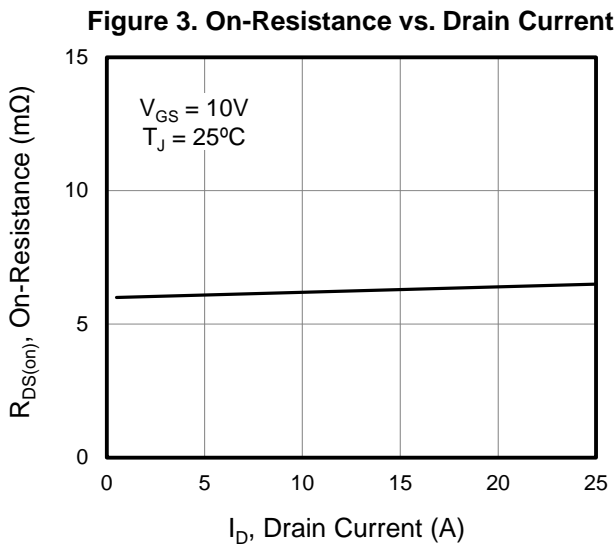
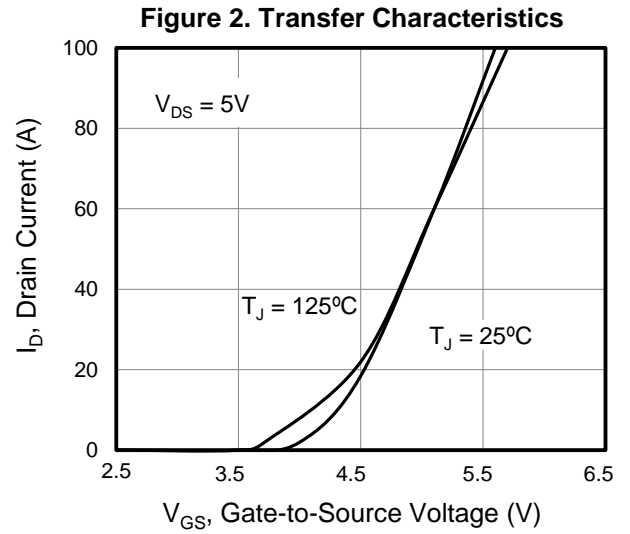
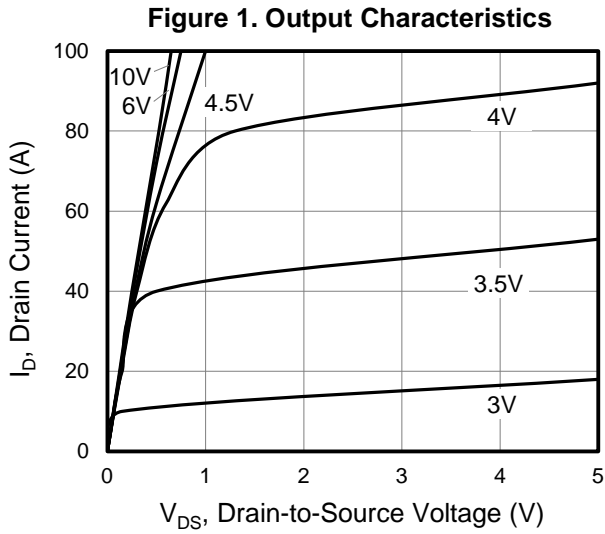
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	R_{thJC}	1.7	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient	R_{thJA}	50	

Specifications $T_J = 25^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	60	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 60V, V_{GS} = 0V, T_J = 25^\circ\text{C}$	--	--	1	μA
		$V_{DS} = 60V, V_{GS} = 0V, T_J = 150^\circ\text{C}$	--	--	100	
Gate-Source Leakage	I_{GSS}	$V_{GS} = \pm 20V$	--	--	± 100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	2.5	--	4	V
Drain-Source On-Resistance (Note3)	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$	--	6.5	9	$\text{m}\Omega$
Forward Transconductance (Note3)	g_{fs}	$V_{DS} = 5V, I_D = 20A$	--	85	--	S
Dynamic						
Input Capacitance	C_{iss}	$V_{GS} = 0V,$ $V_{DS} = 30V,$ $f = 1.0\text{MHz}$	--	2455	--	pF
Output Capacitance	C_{oss}		--	240	--	
Reverse Transfer Capacitance	C_{rss}		--	34	--	
Total Gate Charge	Q_g	$V_{DD} = 30V, I_D = 20A,$ $V_{GS} = 10V$	--	45	--	nC
Gate-Source Charge	Q_{gs}		--	13.5	--	
Gate-Drain Charge	Q_{gd}		--	11.5	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 30V, I_D = 20A,$ $R_G = 3\Omega$	--	8	--	ns
Turn-on Rise Time	t_r		--	3	--	
Turn-off Delay Time	$t_{d(off)}$		--	25	--	
Turn-off Fall Time	t_f		--	4	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	$T_C = 25^\circ\text{C}$	--	--	64	A
Pulsed Diode Forward Current	I_{SM}		--	--	256	
Body Diode Voltage	V_{SD}	$T_J = 25^\circ\text{C}, I_{SD} = 1A, V_{GS} = 0V$	--	0.72	1	V
Reverse Recovery Time	t_{rr}	$I_F = 20A,$ $di_F/dt = 500A/\mu\text{s}$	--	25	--	ns
Reverse Recovery Charge	Q_{rr}		--	110	--	nC

Notes

1. Repetitive Rating: Pulse Width limited by maximum junction temperature
2. $I_{AS} = 36A, V_{DD} = 50V, R_G = 25\Omega, \text{Starting } T_J = 25^\circ\text{C}$
3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 1\%$

Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted



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Figure 7. On-Resistance vs. Junction Temperature

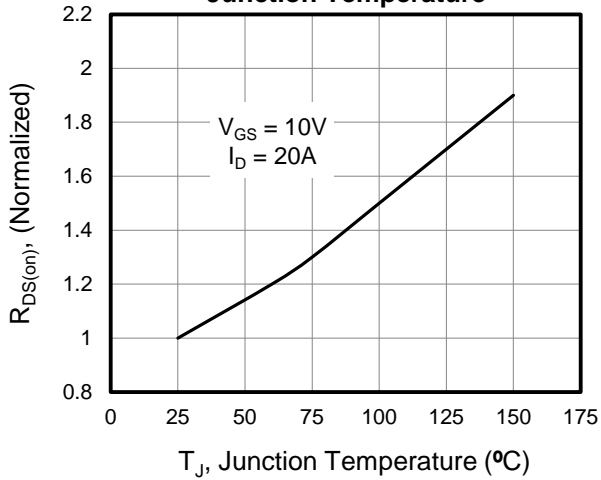


Figure 8. Threshold Voltage vs. Junction Temperature

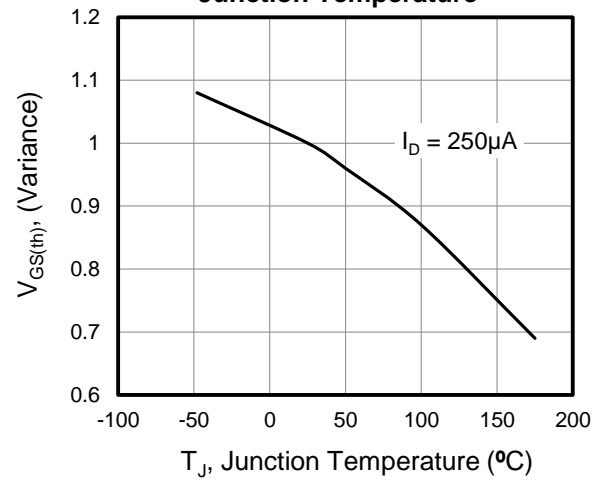


Figure 9. Transient Thermal Impedance

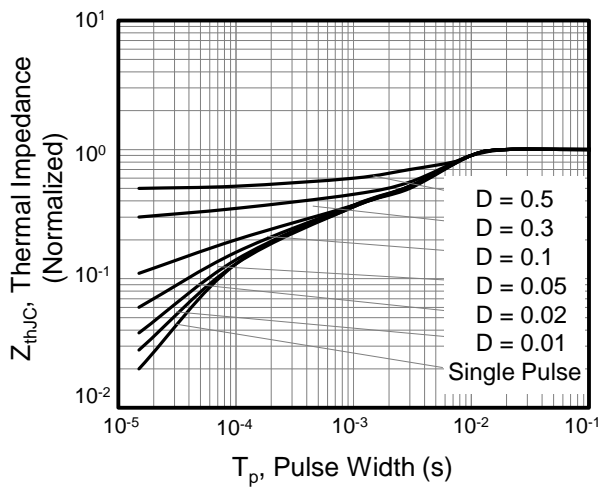


Figure A: Gate Charge Test Circuit and Waveform

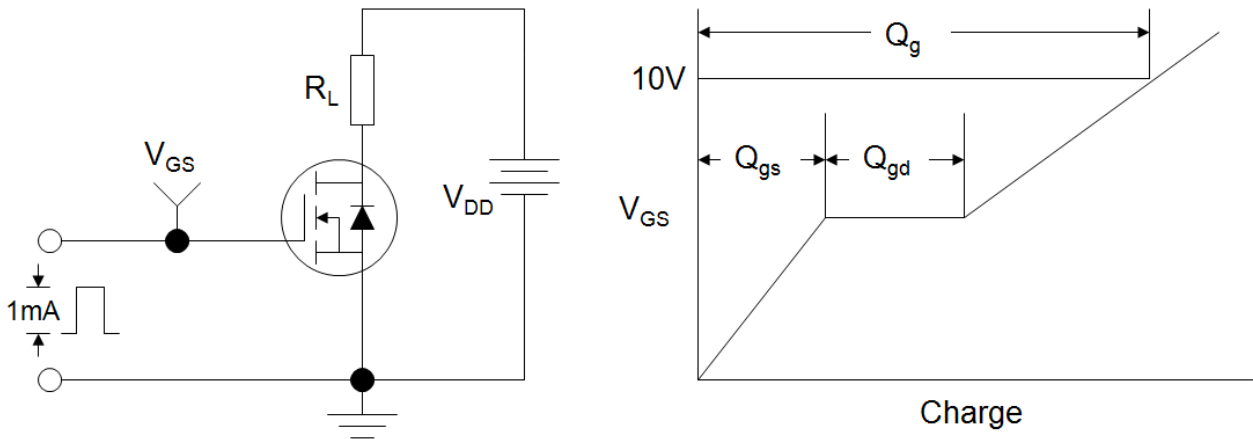


Figure B: Resistive Switching Test Circuit and Waveform

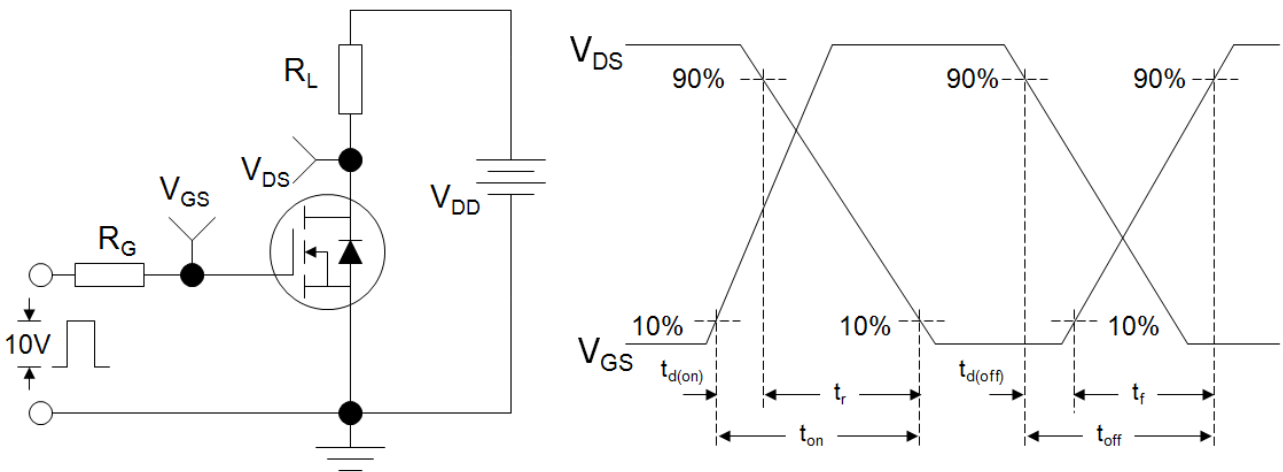
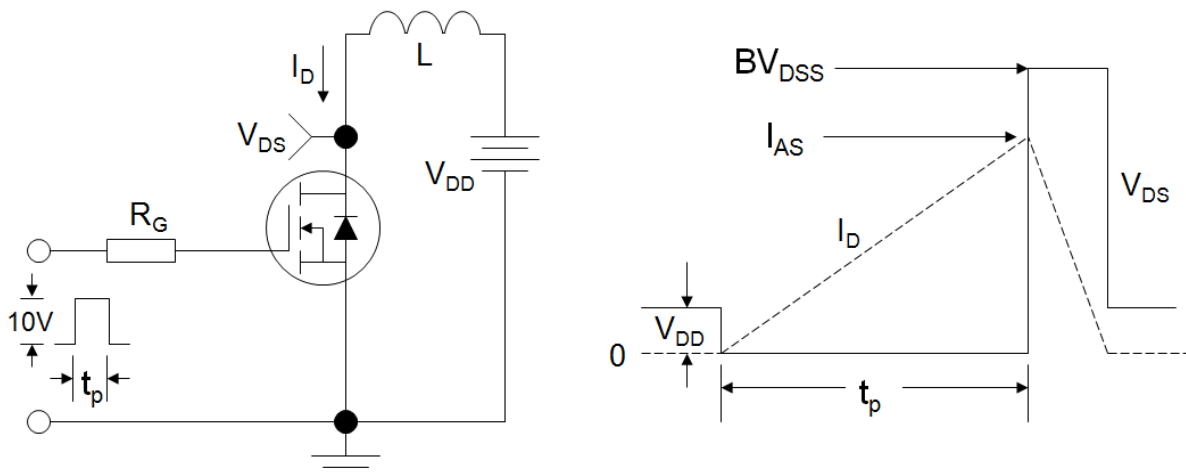
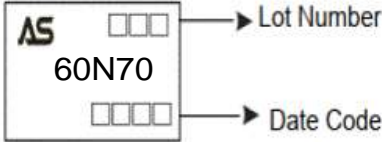


Figure C: Unclamped Inductive Switching Test Circuit and Waveform

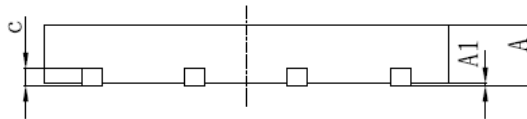
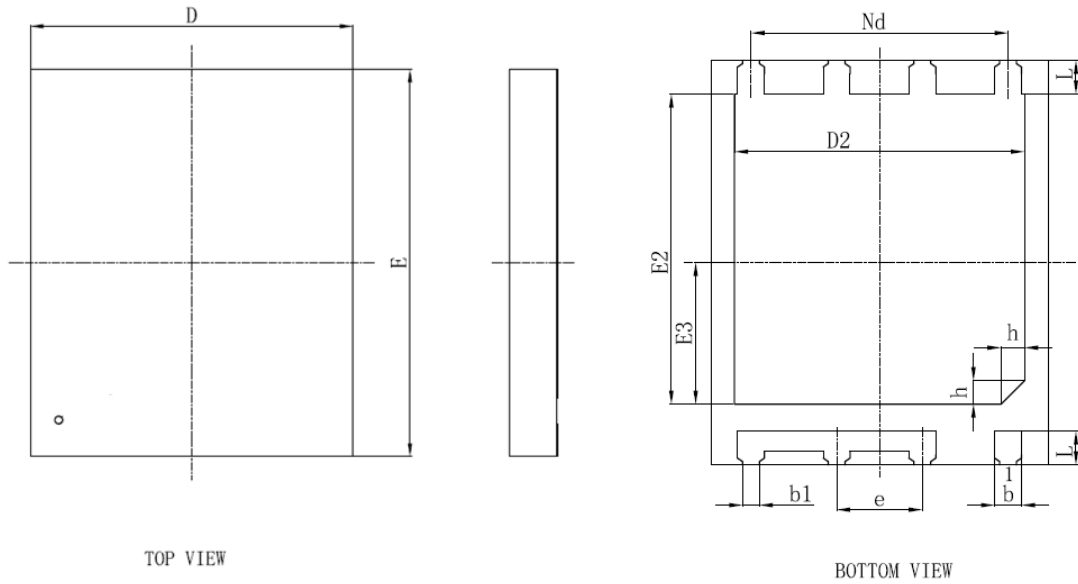


Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASDM60N70Q-R	60N70	DFN5*6-8	Tape&Reel	4000/Reel

PACKAGE	MARKING
DFN5*6-8	 <p>AS □□□ → Lot Number 60N70 □□□□ → Date Code</p>

DFN5*6-8



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0	0.02	0.05
b	0.35	0.40	0.45
b1	0.25REF		
c	0.18	0.203	0.25
D	4.90	5.00	5.10
D2	4.20	4.30	4.40

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
Nd	3.81BSC		
e	1.27BSC		
E	5.90	6.00	6.10
E2	4.50	4.60	4.70
E3	2.00	2.10	2.20
L	0.45	0.50	0.55
h	0.30	0.35	0.40

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