



### FEATURES

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

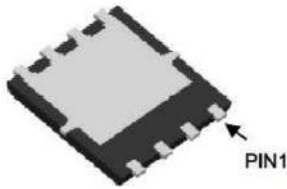
### APPLICATIONS

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

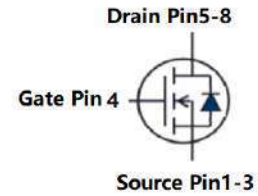
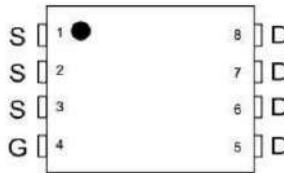
### Product Summary

$V_{DSS}$	60	V
$R_{DS(ON)-Typ@VGS=10V}$	6.5	m $\Omega$
$I_D$	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	$V_{GSS}$	$\pm 20$	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	

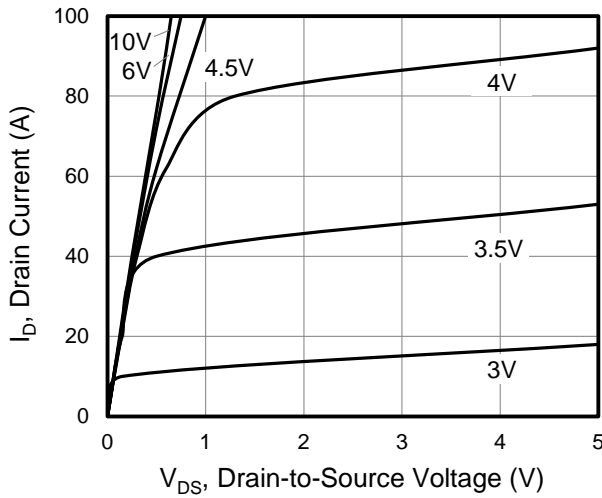
Specifications $T_J = 25^\circ\text{C}$ , unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	60	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 60V, V_{GS} = 0V, T_J = 25^\circ\text{C}$	--	--	1	$\mu A$
		$V_{DS} = 60V, V_{GS} = 0V, T_J = 150^\circ\text{C}$	--	--	100	
Gate-Source Leakage	$I_{GSS}$	$V_{GS} = \pm 20V$	--	--	$\pm 100$	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.5	--	4	V
Drain-Source On-Resistance (Note3)	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$	--	6.5	9	$m\Omega$
Forward Transconductance (Note3)	$g_{fs}$	$V_{DS} = 5V, I_D = 20A$	--	85	--	S
<b>Dynamic</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0V,$ $V_{DS} = 30V,$ $f = 1.0\text{MHz}$	--	2455	--	$\mu F$
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	--	
<b>Drain-Source Body Diode Characteristics</b>						
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	$t_{rr}$	$I_F = 20A,$ $di_F/dt = 500A/\mu s$	--	25	--	ns
Reverse Recovery Charge	$Q_{rr}$		--	110	--	nC

### Notes

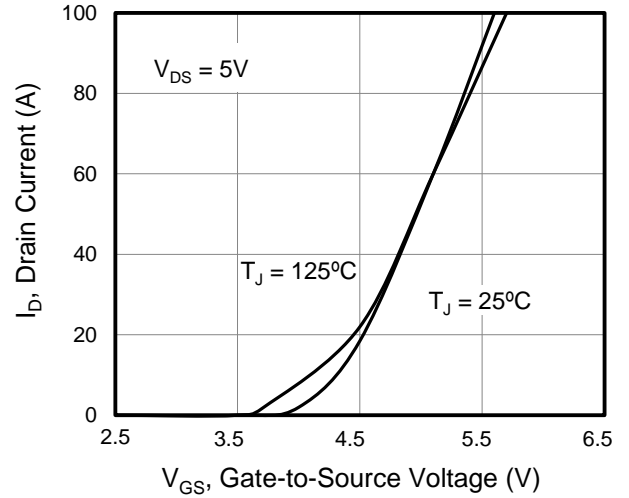
1. Repetitive Rating: Pulse Width limited by maximum junction temperature
2.  $I_{AS} = 36A, V_{DD} = 50V, R_G = 25\Omega, \text{Starting } T_J = 25^\circ\text{C}$
3. Pulse Test: Pulse Width  $\leq 300\mu s, \text{Duty Cycle } \leq 1\%$

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

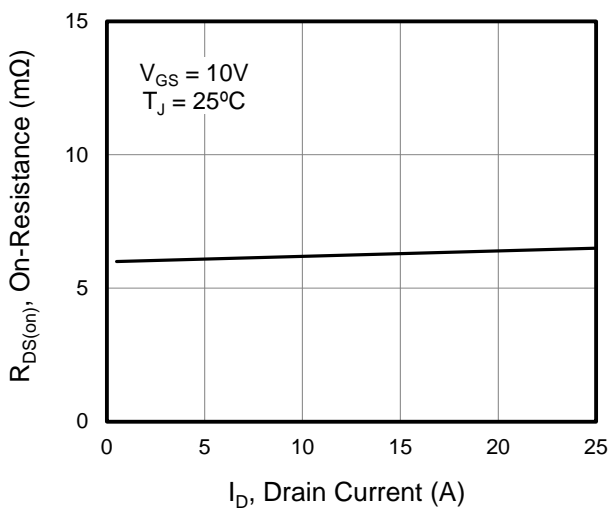
**Figure 1. Output Characteristics**



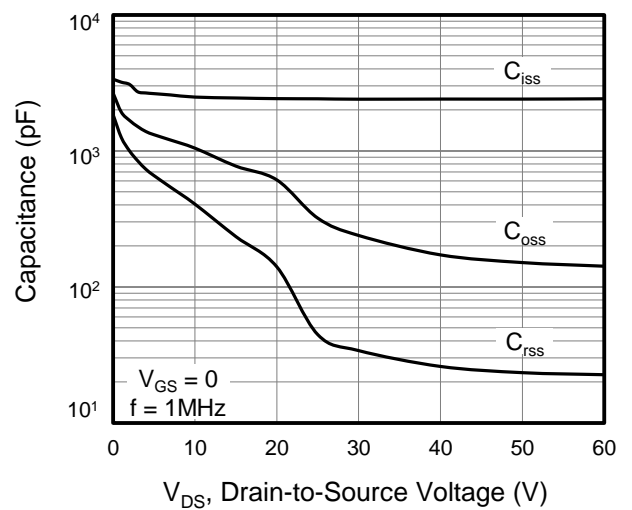
**Figure 2. Transfer Characteristics**



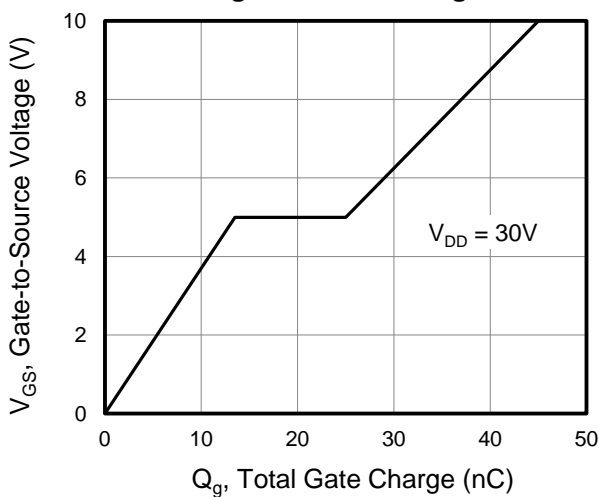
**Figure 3. On-Resistance vs. Drain Current**



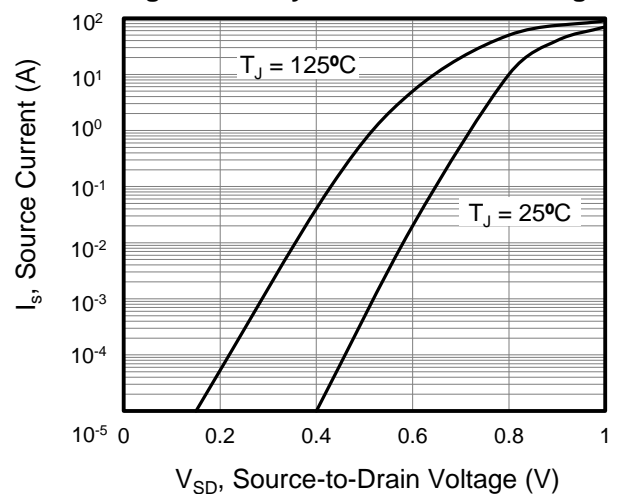
**Figure 4. Capacitance**



**Figure 5. Gate Charge**



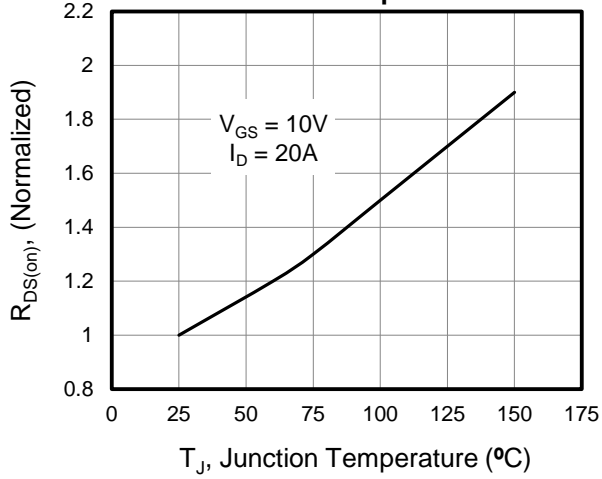
**Figure 6. Body Diode Forward Voltage**



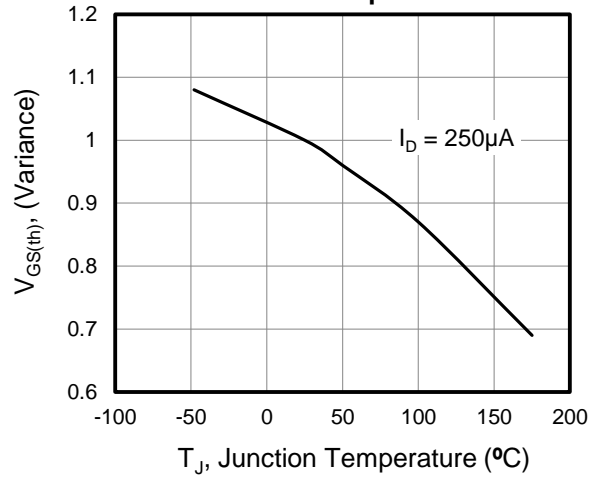


### Typical Characteristics $T_J = 25^\circ\text{C}$ , unless otherwise noted

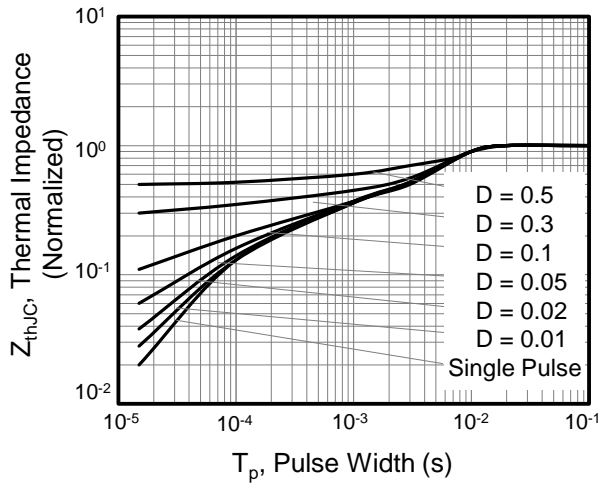
**Figure 7. On-Resistance vs. Junction Temperature**



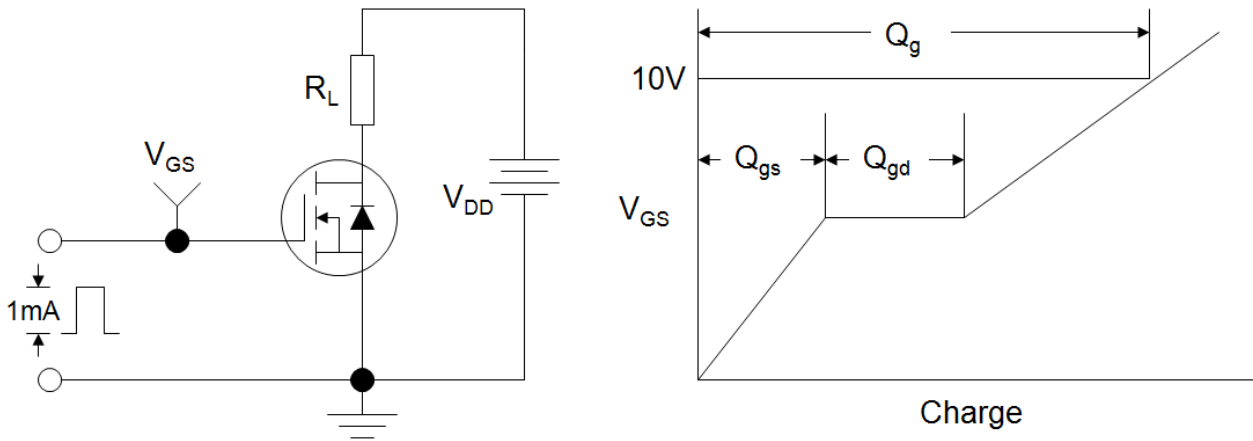
**Figure 8. Threshold Voltage vs. Junction Temperature**



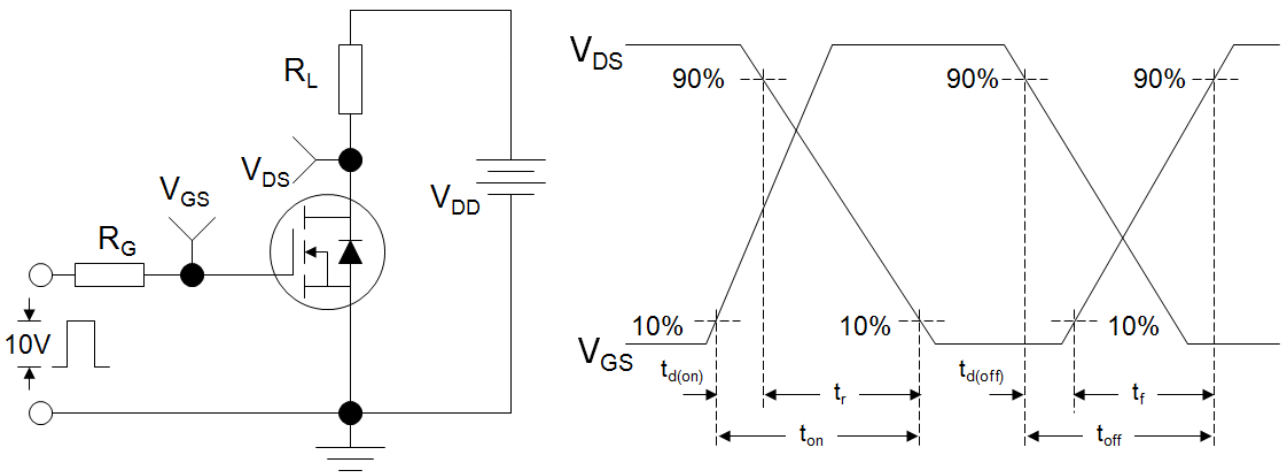
**Figure 9. Transient Thermal Impedance**



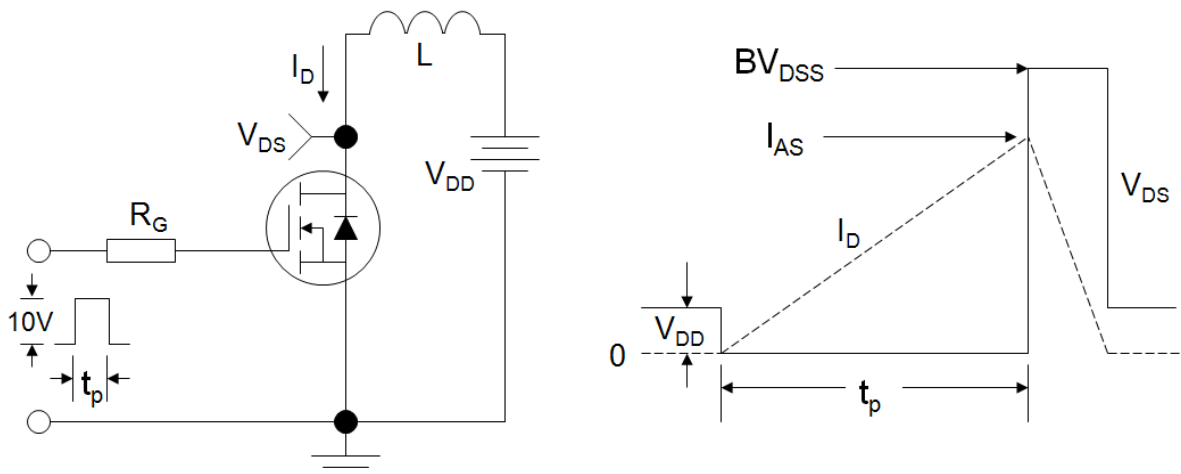
**Figure A: Gate Charge Test Circuit and Waveform**



**Figure B: Resistive Switching Test Circuit and Waveform**

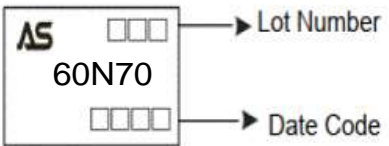


**Figure C: Unclamped Inductive Switching Test Circuit and Waveform**

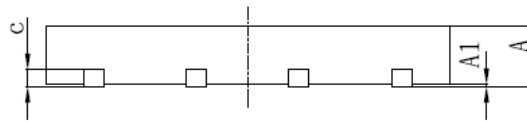
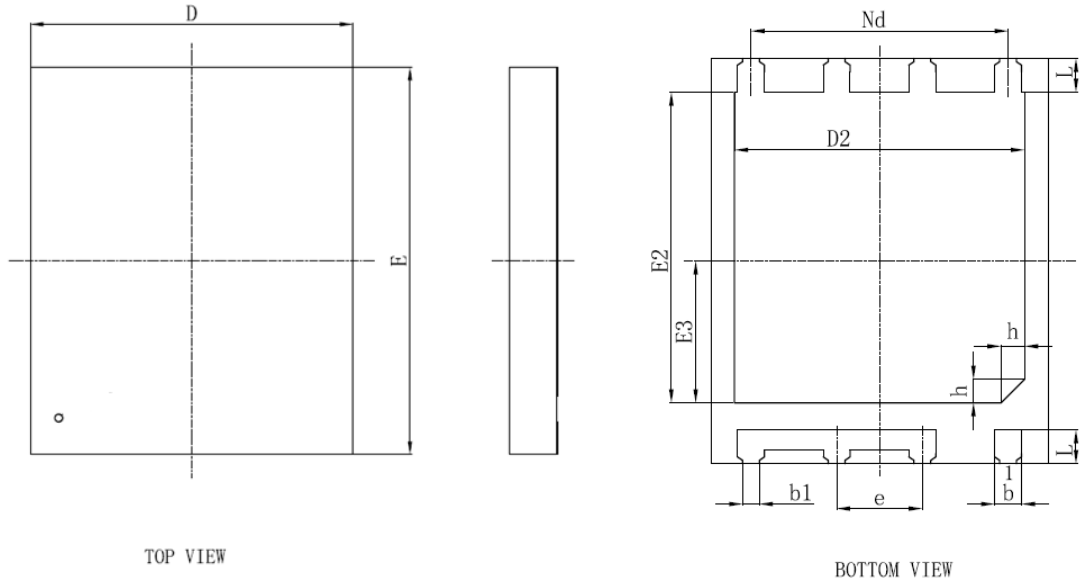


### Ordering and Marking Information

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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