Features

- Advanced trench cell design
- Low Thermal Resistance

Application

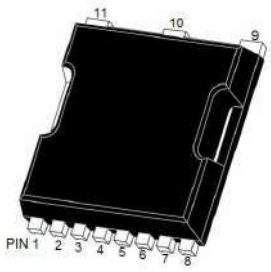
- Motor drives
- Power Tool
- BMS
- DC-DC converters and Off-line UPS

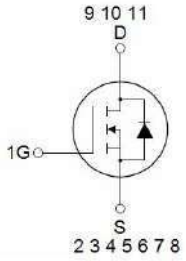
Product Summary

RoHs

V_{DS}	85	V
$R_{DS(on),Typ}$@ V_{GS}=10V	2.4	mΩ
I_D	260	A

TOLL





Absolute Maximum Ratings (at T_a = 25°C unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	85	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Cure	Tc = 25℃	I_D	260	A
	Tc = 100℃		130	
Peak Drain Current, Pulsed [1]		I_{DM}	722	A
Avalanche Current		I_{AS}	41.5	A
Single Pulse Avalanche Energy [2]		E_{AS}	430	mJ
Power Dissipation	Tc = 25°C	P_{tot}	227	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55~150	°C

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.41	°C/W
Thermal Resistance from Junction to Ambient [3]	$R_{\theta JA}$	44	°C/W

[1] Pulse Test: Pulse Width ≤ 100 μs, Duty Cycle ≤ 2%, Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$ = 150°C.

[2] Limited by $T_{J(MAX)}$, starting T_J = 25 °C, L = 0.5 mH, R_g = 25 Ω, I_D = 41.5A.

[3] Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air.

Characteristics at T_a = 25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at I_D = 250 μA	BV_{DSS}	85			V
Drain-Source Leakage Current at V_{DS} = 80 V	I_{DSS}			1	μA
Gate Leakage Current at V_{GS} = ± 20 V	I_{GSS}			± 100	nA
Gate-Source Threshold Voltage at V_{DS} = V_{GS}, I_D = 250 μA	$V_{GS(th)}$	2.0	3.0	4.0	V
Drain-Source On-State Resistance at V_{GS} = 10 V, I_D = 20 A	$R_{DS(on)}$		2.4	2.8	mΩ
DYNAMIC PARAMETERS					
Gate resistance at V_{DS} = 5 V, f = 1 MHz	R_g		1.6		Ω
Input Capacitance at V_{GS} = 0 V, V_{DS} = 43 V, f = 1 KHz	C_{iss}		7234		pF
Output Capacitance at V_{GS} = 0 V, V_{DS} = 43 V, f = 1 KHz	C_{oss}		1044		pF
Reverse Transfer Capacitance at V_{GS} = 0 V, V_{DS} = 43 V, f = 1 KHz	C_{rss}		42		pF
Gate charge total at V_{DS} = 50 V, I_D = 90 A, V_{GS} = 10 V	Q_g		130		nC
Gate to Source Charge at V_{DS} = 68 V, I_D = 60 A, V_{GS} = 10 V	Q_{gs}		40		nC
Gate to Drain Charge at V_{DS} = 68 V, I_D = 60 A, V_{GS} = 10 V	Q_{gd}		39		nC
Turn-On Delay Time at V_{GS} = 10 V,V_{DS} = 43V,R_g = 4.7Ω,R_L = 0.72 Ω, I_{DS} =60 A	$t_{d(on)}$		37		ns
Turn-On Rise Time at V_{GS} =10 V,V_{DS} = 43 V,R_g =4.7Ω,R_L = 0.72 Ω,I_{DS} =60 A	t_r		63		ns
Turn-Off Delay Time at V_{GS} =10 V,V_{DS} = 43V,R_g = 4.7Ω,R_L= 0.72 Ω, I_{DS} =60 A	$t_{d(off)}$		78		ns
Turn-Off Fall Time at V_{GS} =10 V,V_{DS} = 43V,R_g = 4.7Ω,R_L = 0.72Ω, I_{DS} =60 A	t_f		41		ns
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at I_S = 60 A, V_{GS} = 0 V	V_{SD}			1.4	V
Body Diode Reverse Recovery Time at I_F = 60 A, di/dt = 100 A / μs	t_{rr}		56		ns
Body Diode Reverse Recovery Charge at I_F = 60 A, di/dt = 100 A / μs	Q_{rr}		84		nC

Electrical Characteristics Curves

Fig.1: On-state characteristics（note f）

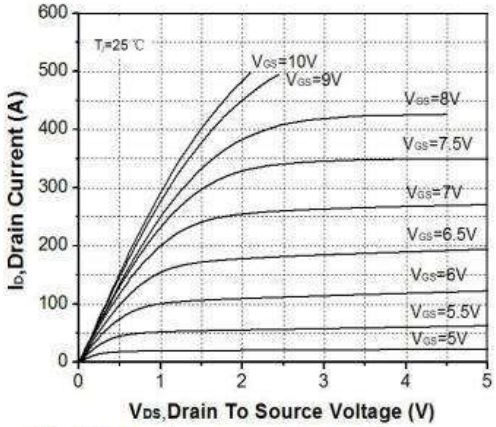


Fig.2:Transfer Characteristics（note f）

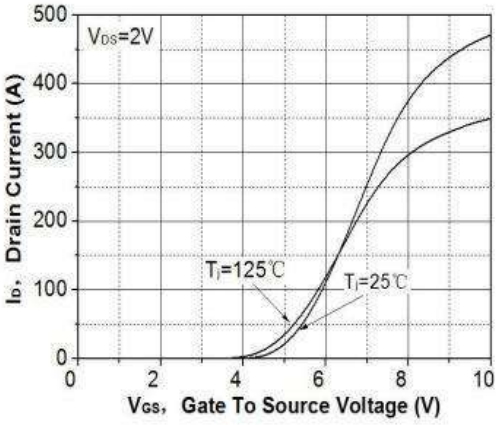


Fig.3:On-resistance variation vs.drain current and gate voltage（note f）

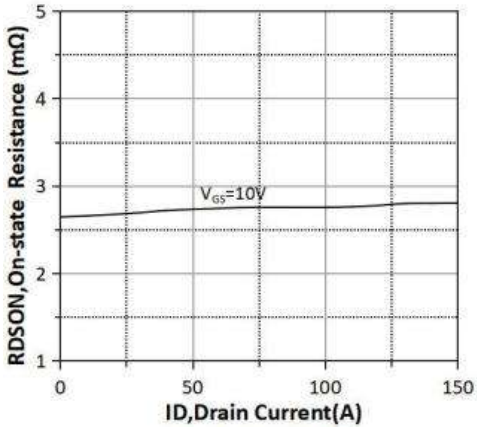


Fig.4:On-state current vs. diode forward voltage（note f）

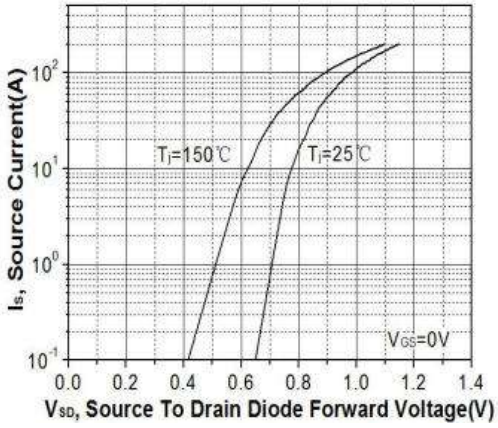


Fig.5:Breakdown voltage variation vs. junction temperature

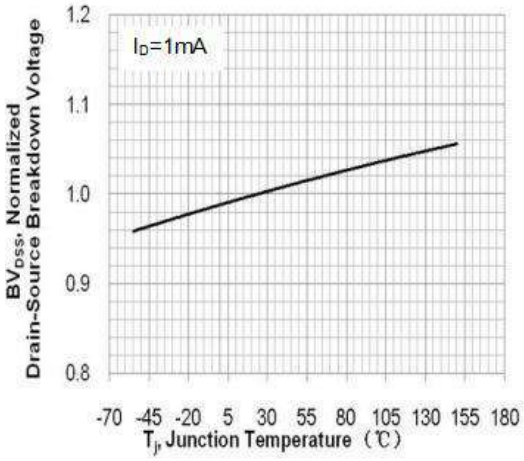
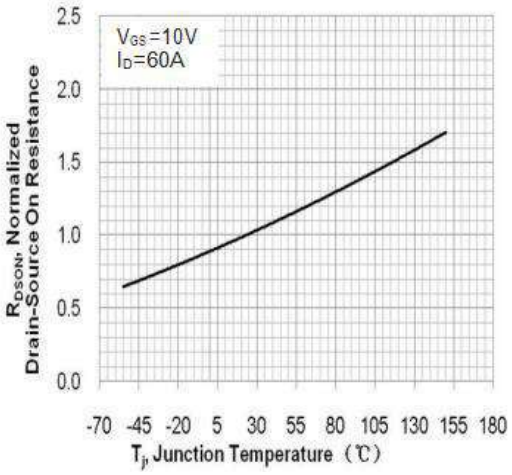


Fig.6:On-resistance variation vs. junction temperature（note f）



Electrical Characteristics Curves

Fig.7:Gate charge characteristics

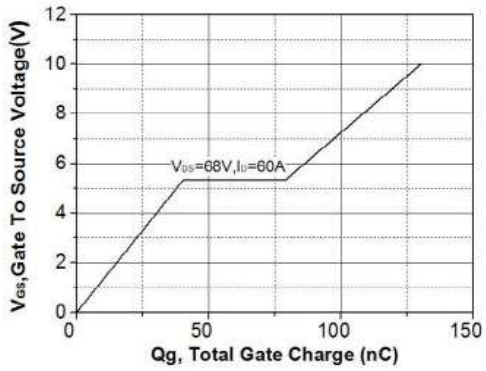


Fig.8:Capacitance characteristics

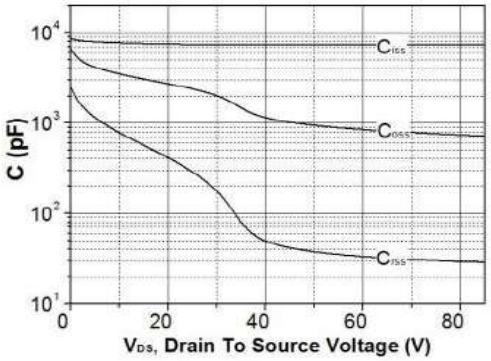


Fig.9:Maximum safe operating area

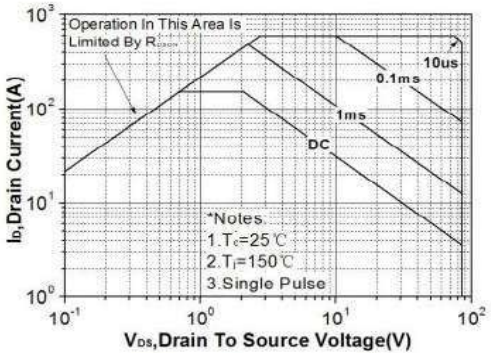
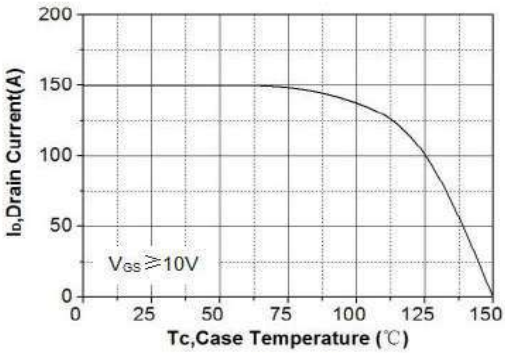
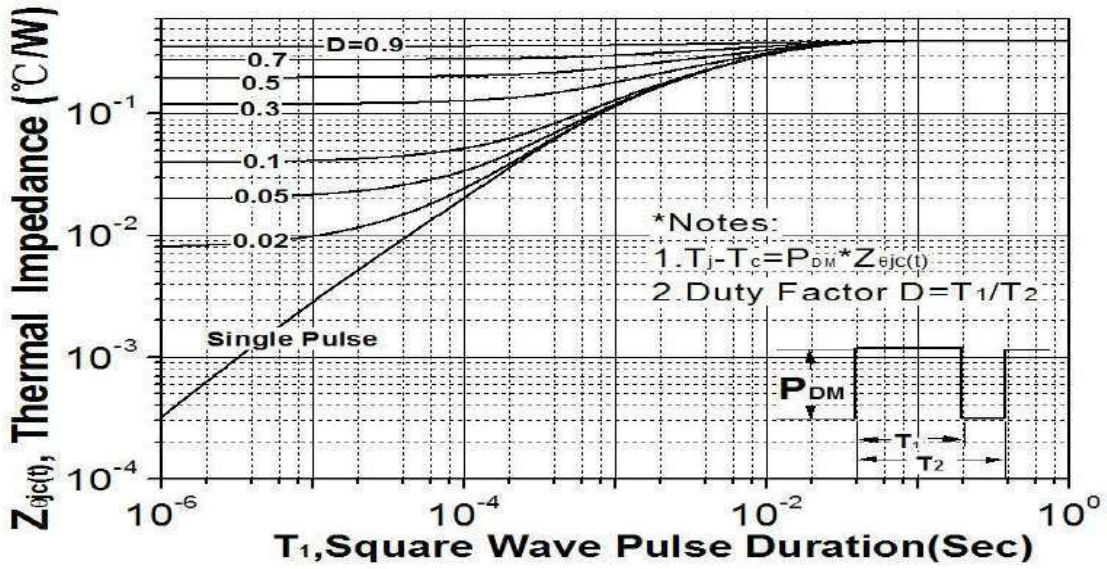


Fig.10:Maximum drain current vs. case temperature



Electrical Characteristics Curves



Test Circuits

Fig.1-1 Switching times test circuit

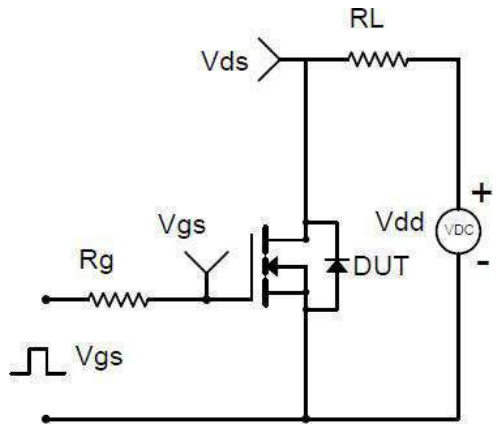


Fig.1-2 Switching Waveform

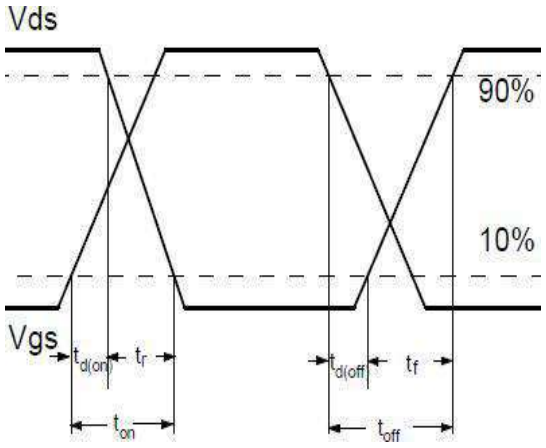


Fig.2-1 Gate charge test circuit

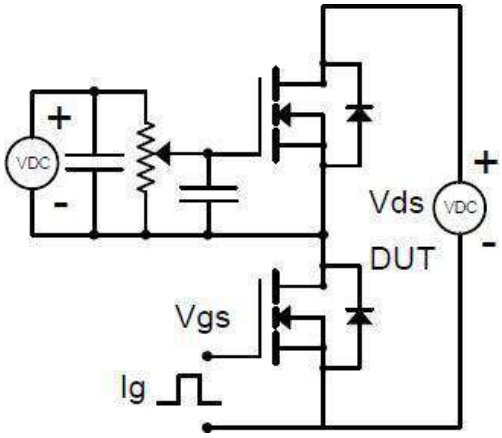


Fig.2-2 Gate charge waveform

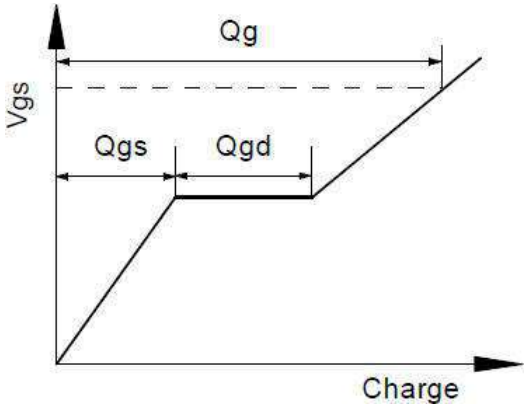


Fig.3-1 Avalanche test circuit

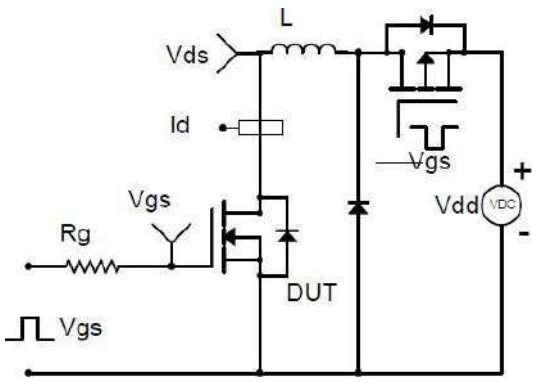
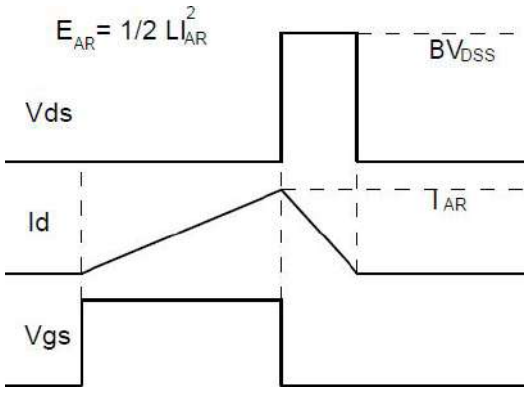
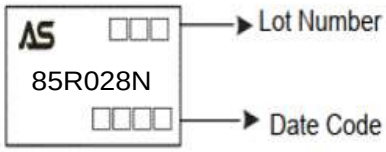


Fig.3-2 Avalanche waveform



Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASDM85R028NT-R	85R028N	TOLL	Tape&Reel	2000/ Reel

PACKAGE	MARKING
TOLL	

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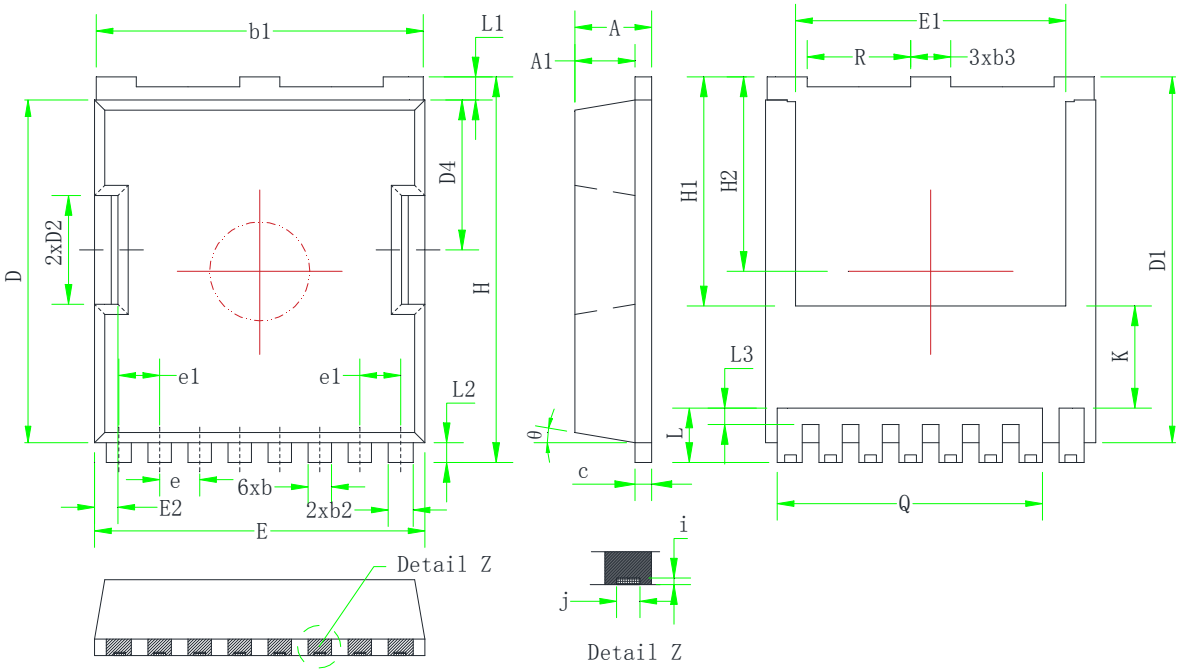

Symbol	Min	Typ	Max		Symbol	Min	Typ	Max
A	2.25	2.30	2.35		E2	0.65	0.70	0.75
A1	1.75	1.80	1.85		H	11.60	11.70	11.80
b	0.65	0.70	0.75		H1	6.95 BSC		
b1	9.75	9.80	9.85		H2	5.90 BSC		
b2	0.70	0.75	0.80		i	0.10 REF		
b3	1.15	1.20	1.25		j	0.35 REF		
c	0.45	0.50	0.55		K	3.10 REF		
D	10.35	10.40	10.45		L	1.55	1.65	1.75
D1	11.00	11.10	11.20		L1	0.65	0.70	0.75
D2	3.25	3.30	3.35		L2	0.50	0.60	0.70
D4	4.50	4.55	4.60		L3	0.40	0.50	0.60
e	1.20 BSC				Q	7.95 REF		
e1	1.225 BSC				R	3.05	3.10	3.15
E	9.85	9.90	9.95		θ	10°REF		
E1	8.00	8.10	8.20					

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