

V_{DS} , 100V $R_{DS(ON)}$, 9.6m Ω (max.) @ $V_{GS}=10V$ $R_{DS(ON)}$, 12.5m Ω (max.) @ $V_{GS}=4.5V$ I_D , 71A	T0-252	

Description	Features
The DG100N03D uses advanced DG-FET™ technology and designs to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in PWM, load switching and general purpose applications.	<ul style="list-style-type: none"> Low On-Resistance Low Input Capacitance Low Miller Charge Low Input/Output Leakage
	Applications
	<ul style="list-style-type: none"> Lithium-Ion Secondary Batteries Load Switch DC-DC converters and Off-line UPS

Ordering Information

Ordering Code	RoHS Status	Package	Package Code	Packing	Quantity
DG100N03D	Halogen-Free	T0-252	D	Tape & Reel	3,000

Absolute Maximum Ratings ($T_A=25^{\circ}C$ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 25	V
Drain Current-Continuous	$T_C=25^{\circ}C$	I_D	71	A
	$T_C=100^{\circ}C$		45	A
Drain Current-Pulsed ^{Note 1}		I_{DM}	170	A
Avalanche Current		I_{AS}	18	A
Avalanche Energy, L=0.1mH		E_{AS}	16.2	mJ
Maximum Power Dissipation	$T_C=25^{\circ}C$	P_D	104	W
	$T_C=100^{\circ}C$		41	W
Storage Temperature Range		T_{STG}	-55 to +150	$^{\circ}C$
Operating Junction Temperature Range		T_J	-55 to +150	$^{\circ}C$

Thermal Resistance Ratings

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Maximum Junction-to-Ambient ^{Note 2}	$R_{\theta JA}$	Steady State	-	-	50	$^{\circ}C/W$
Maximum Junction-to-Case	$R_{\theta JC}$	Steady State	-	-	1.2	$^{\circ}C/W$

Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise noted)

OFF CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_{DS} = 250\mu A$	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80V, V_{GS} = 0V$	-	-	1	μA
Gate-Body Leakage	I_{GSS}	$V_{GS} = \pm 25V, V_{DS} = 0V$	-	-	± 100	nA

ON CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_{DS} = 250\mu A$	1.0	-	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_{DS} = 18A$	-	7.8	9.6	m Ω
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS} = 4.5V, I_{DS} = 10A$	-	9.5	12.5	m Ω

DYNAMIC CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Capacitance	C_{iss}	$V_{DS} = 50V, V_{GS} = 0V, f = 1MHz$	-	2048	-	pF
Output Capacitance	C_{oss}		-	684	-	
Reverse Transfer Capacitance	C_{rss}		-	7	-	
Gate Resistance	R_g	$V_{GS} = 0V, V_{DS} = 0V, f = 1MHz$	-	0.5	0.9	Ω

SWITCHING CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-On Delay Time	$T_{d(on)}$	$V_{DS} = 50V, V_{GS} = 10V, R_{GEN} = 3\Omega$	-	7.6	-	ns
Rise Time	t_r		-	2.7	-	
Turn-Off Delay Time	$T_{d(off)}$		-	23.5	-	
Fall Time	t_f		-	3.5	-	
Total Gate Charge at 4.5V	Q_g	$V_{DS} = 50V, I_{DS} = 13A, V_{GS} = 4.5V$	-	13	-	nC
Gate to Source Gate Charge	Q_{gs}		-	6	-	
Gate to Drain "Miller" Charge	Q_{gd}		-	3	-	

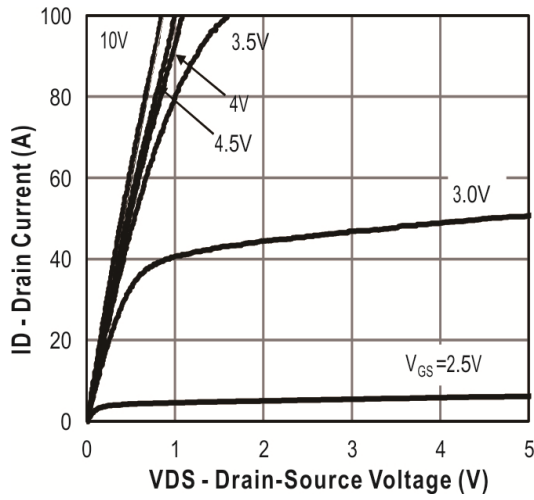
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 1A$	-	-	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 13A, di/dt = 500A/\mu s, T_J = 25^\circ C$	-	-	23	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	-	105	nC

Notes:

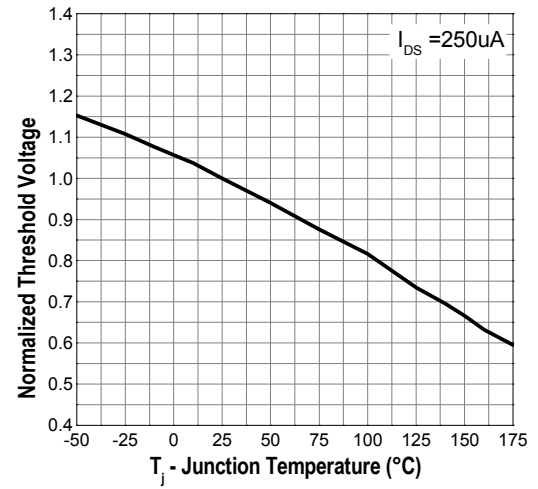
- Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design. $R_{\theta JA}$ shown below for single device operation on FR-4 in still air.

Typical Operating Characteristics

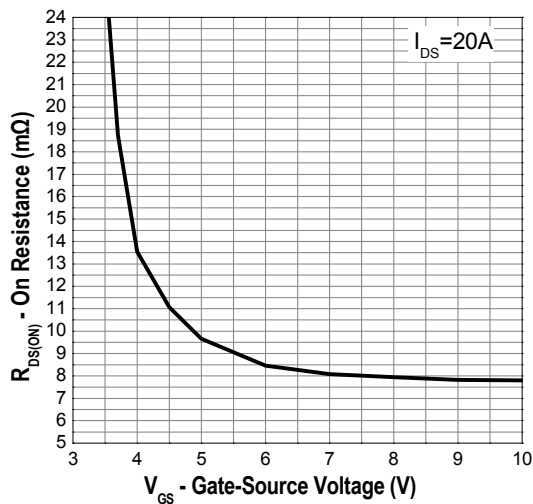
Output Characteristics



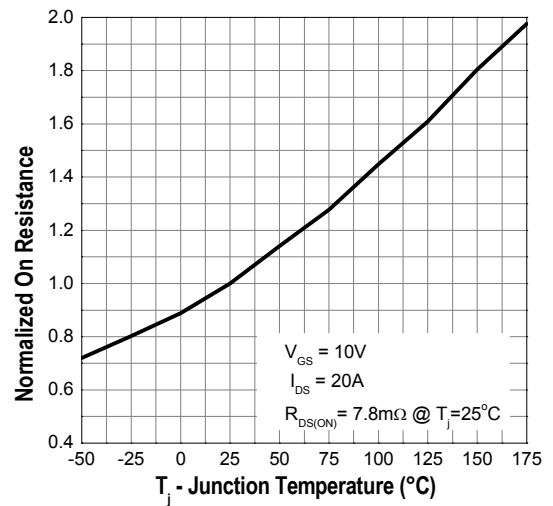
Gate Threshold Voltage



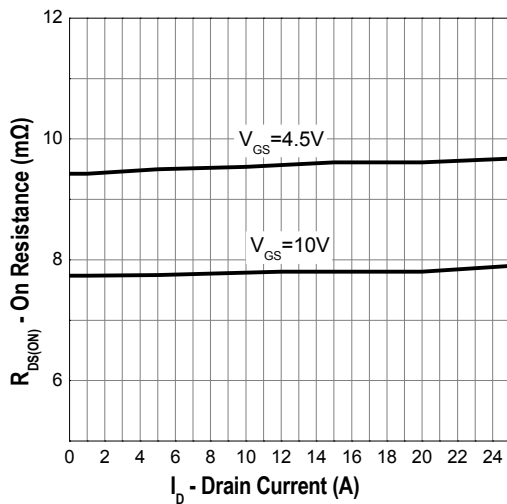
Gate-Source On Resistance



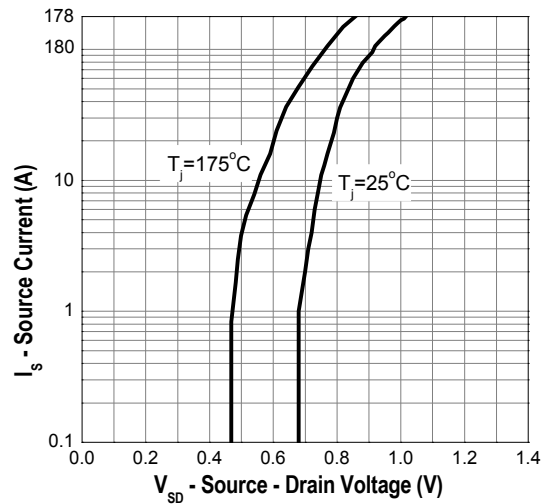
Drain-Source On Resistance



Drain-Source On Resistance

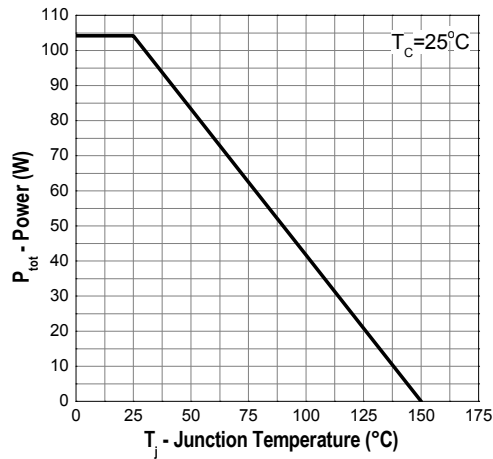


Source-Drain Diode Forward

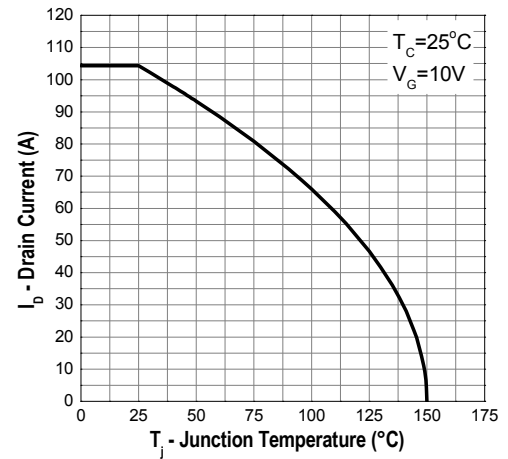


Typical Operating Characteristics (Cont.)

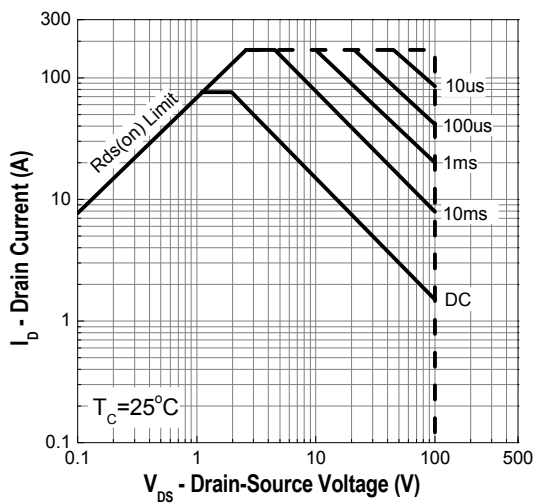
Power Dissipation



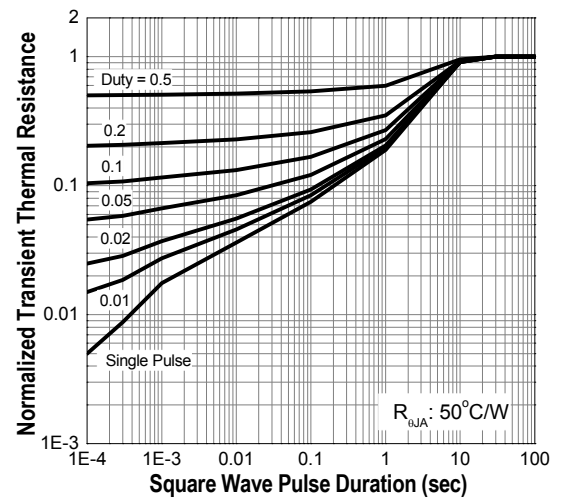
Drain Current



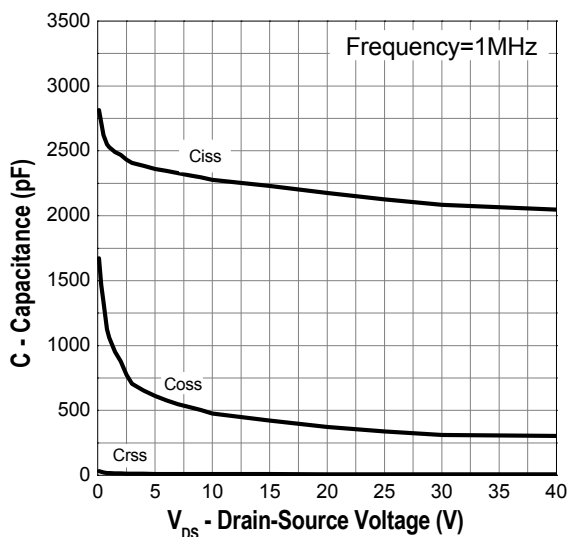
Safe Operation Area



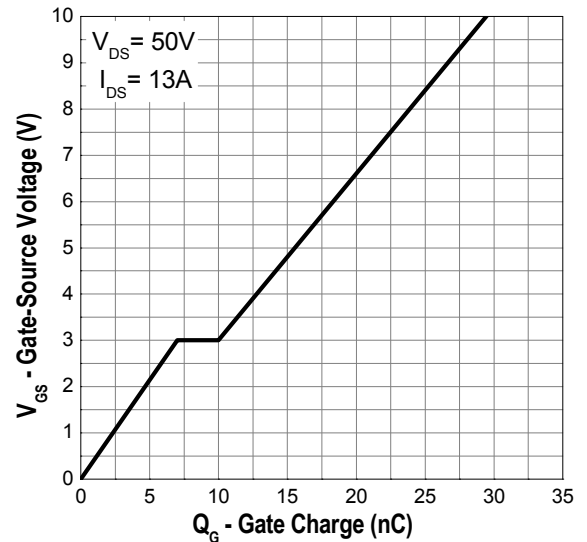
Transient Thermal Impedance



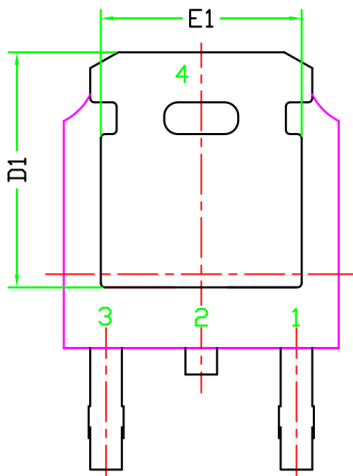
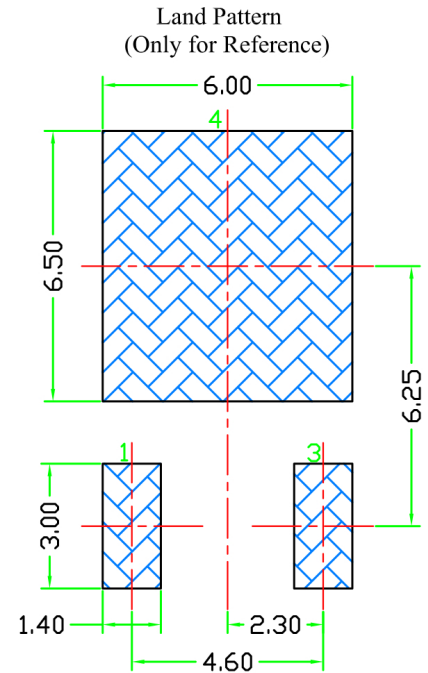
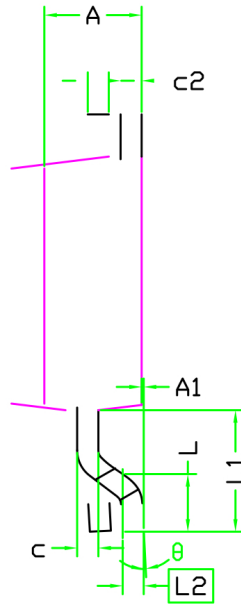
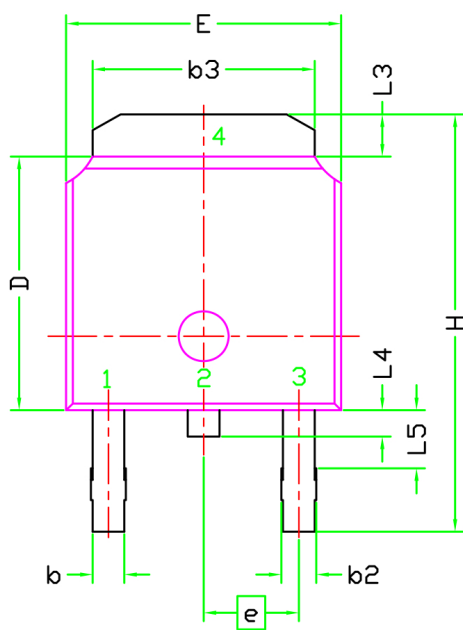
Capacitance



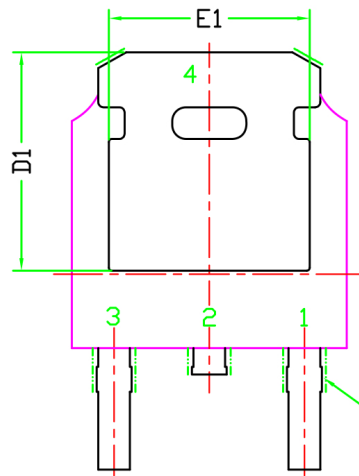
Gate Charge



Outline Dimension



SINGLE ROW(NEW)



MATRIX L/F

COPPER
EXPOSITION
AREA

SYMBOL	DIMENSIONAL REQMTS		
	MIN	NOM	MAX
E	6.40	6.60	6.731
L	1.40	1.52	1.77
L1	2.743 REF		
L2	0.508 BSC		
L3	0.89	--	1.27
L4	0.64	--	1.01
L5	--	--	--
D	6.00	6.10	6.223
H	9.40	10.00	10.40
b	0.64	0.76	0.88
b2	0.77	0.84	1.14
b3	5.21	5.34	5.46
e	2.286 BSC		
A	2.20	2.30	2.38
A1	0	--	0.127
c	0.46	0.50	0.60
c2	0.46	0.50	0.58
D1	5.21	--	--
E1	4.40	--	--
θ	0°	--	10°

Note:

1. All Dimension Are In mm.
2. Package Body Sizes Exclude Mold Flash, Protrusion Or Gate Burrs.
Mold Flash, Protrusion Or Gate Burrs Shall Not Exceed 0.10 mm Per Side.
3. Package Body Sizes Determined At The Outmost Extremes Of The Plastic Body Exclusive Of Mold Flash, Gate Burrs And Interlead Flash, But Including Any Mismatch Between The Top And Bottom Of The Plastic Body.
4. The Package Top May Be Smaller Than The Package Bottom.
5. Dimension "b" Does Not Include Dambar Protrusion. Allowable Dambar Protrusion Shall Be 0.10 mm Total In Excess Of "b" Dimension At Maximum Material Condition. The Dambar Cannot Be Located On The Lower Radius Of The Foot.

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