Single N-Channel Enhancement Mode MOSFET

Feature

30V/100A

$R_{DS(ON)}$= 2.3 mΩ(typ.) @V_{GS} = 10V

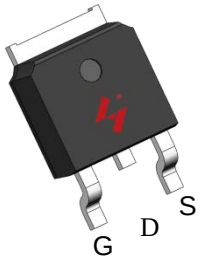
$R_{DS(ON)}$= 3.0 mΩ(typ.) @V_{GS} = 4.5V

100% Avalanche Tested

Reliable and Rugged

Halogen- Free Devices Available

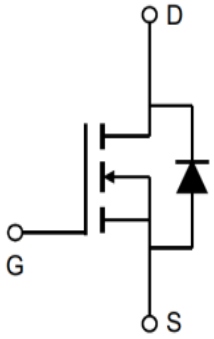
Pin Description



Applications

Battery Protection

DC-DC Converters



Single N-Channel MOSFET

Ordering and Marking Information

D G024N03 XYMXXXXXX	Package Code D: TO-252-2L Date Code XYMXXXXXX

Note: HUAYI lead-free products contain molding compounds/die attach materials and 100% matte tin plate Termi-Nation finish;which are fully compliant with RoHS. HUAYI lead-free products meet or exceed the lead-Free require-ments of IPC/JEDEC J-STD-020 for MSL classification at lead-free peak reflow temperature. HUAYI defines “Green” to mean lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500ppm by weight).

HUAYI reserves the right to make changes, corrections, enhancements, modifications, and improvements to this pr-oduct and/or to this document at any time without notice.

HYG024N03LR1D

2 erc 0 Tw 10.08 0 4.2570Rat-3.85(i)-8(o)2n-3.6o1mgc 0 Tw 10.08

Electrical Characteristics (Cont.) (Tc =25 Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	HYG024N03LR1			Unit
			Min	Typ.	Max	
Dynamic Characteristics						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	-	2.8	-	
C_{iss}	Input Capacitance	V_{GS}=0V,	-	3918	-	pF
C_{oss}	Output Capacitance	V_{DS}=25V,	-	567	-	
C_{rss}	Reverse Transfer Capacitance	Frequency=1.0MHz	-	441	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=24V,R_G=4Ω,	-	10.6	-	ns
T_r	Turn-on Rise Time		-	69.8	-	
$t_{d(OFF)}$	Turn-off Delay Time	I_{DS}=20A,V_{GS}=10V	-	67.2	-	
T_f	Turn-off Fall Time		-	90.5	-	
Gate Charge Characteristics						
Q_g	Total Gate Charge ÄV$_{GS}$=10V Å	V_{DS} =24V, I_D=20A	-	86.8	-	nC
Q_g	Total Gate Charge ÄV$_{GS}$=4.5V)		-	.7	-	
Q_{gs}	Gate-Source Charge		-	12.6	-	
Q_{gd}	Gate-Drain Charge		-	21.7	-	

Note: *Pulse test Èpulse width ≤ 300us Èduty cycle ≤ 2%

Typical Operating Characteristics

Figure 1: Power Dissipation

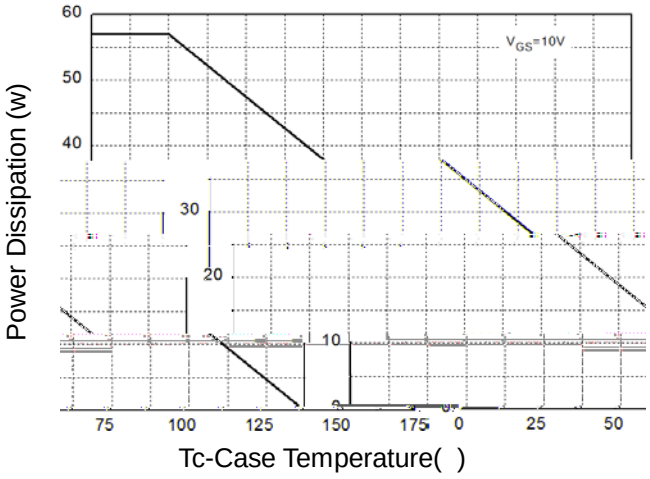


Figure 2: Drain Current

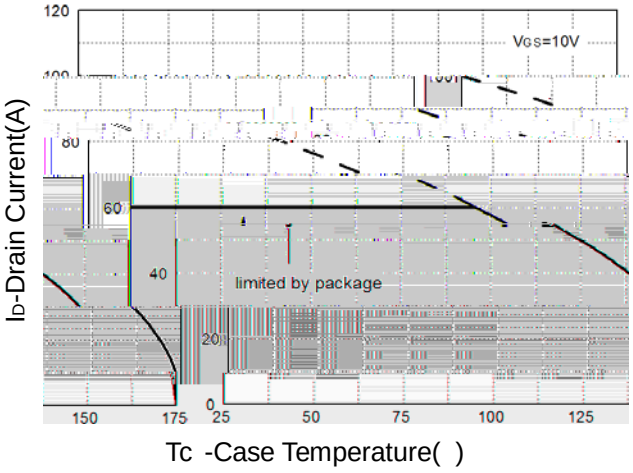


Figure 3: Safe Operation Area

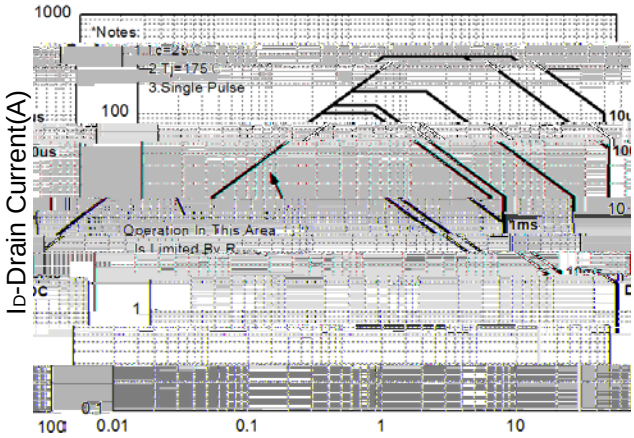


Figure 4: Thermal Transient Impedance

Figure 5: Output Characteristics

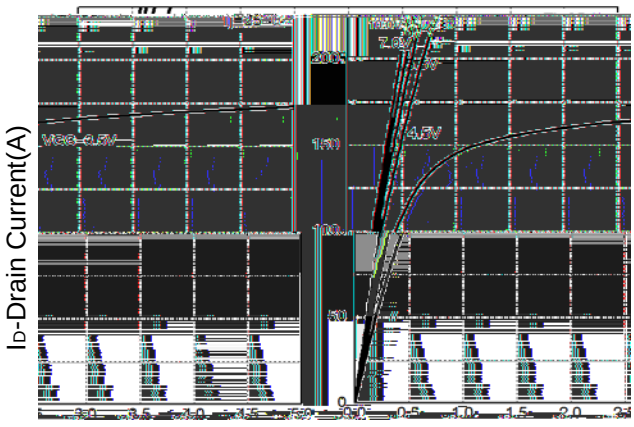
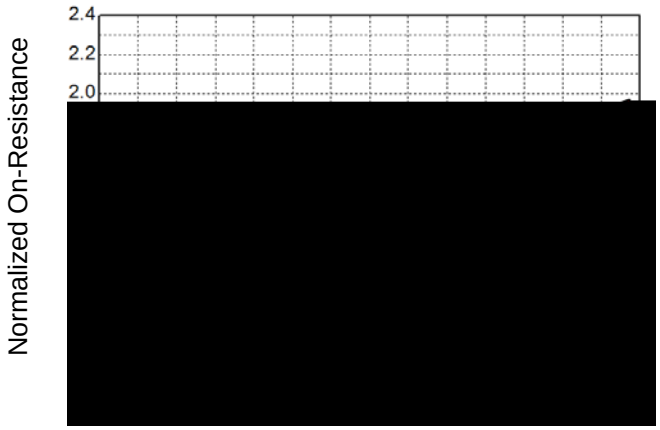


Figure 6: Drain-Source On Resistance

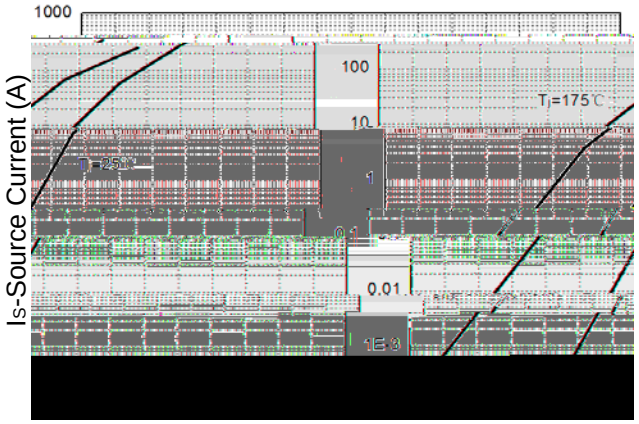
Typical Operating Characteristics(Cont.)

Figure 7: On-Resistance vs. Temperature



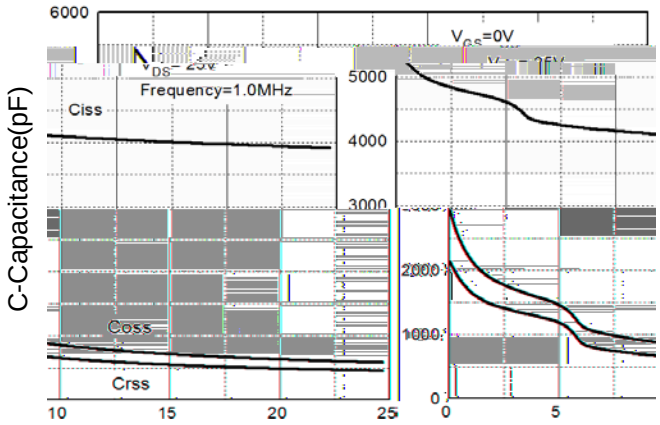
Tj-Junction Temperature ( )

Figure 8: Source-Drain Diode Forward



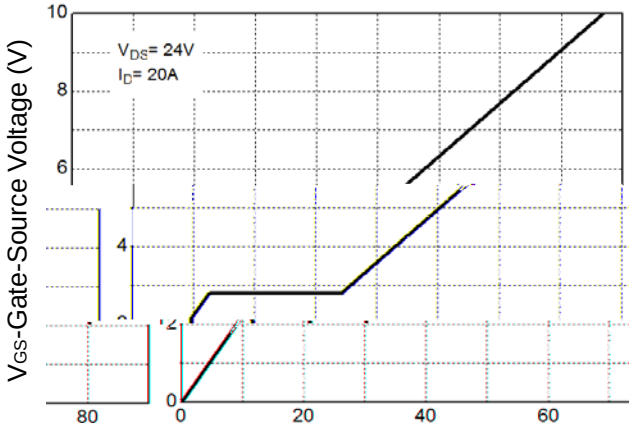
VSD-Source-Drain Voltage(V)

Figure 9: Capacitance Characteristics



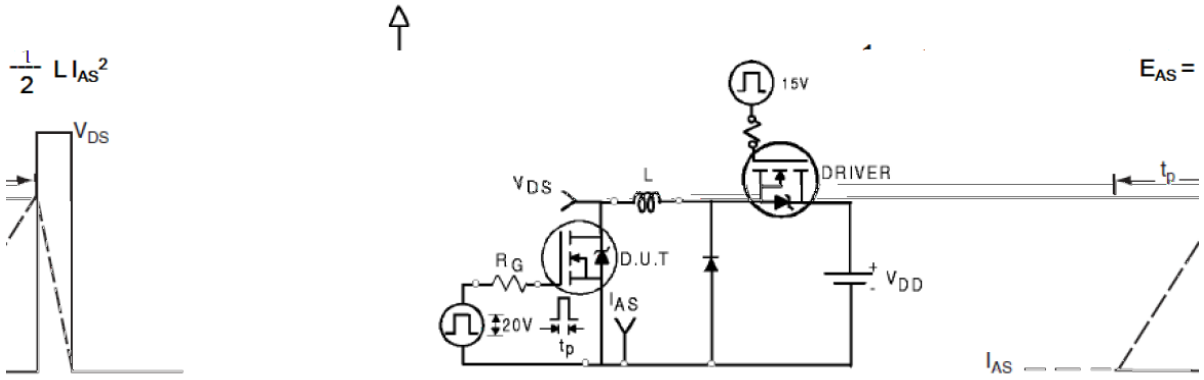
VDS-Drain-Source Voltage (V)

Figure 10: Gate Charge Characteristics

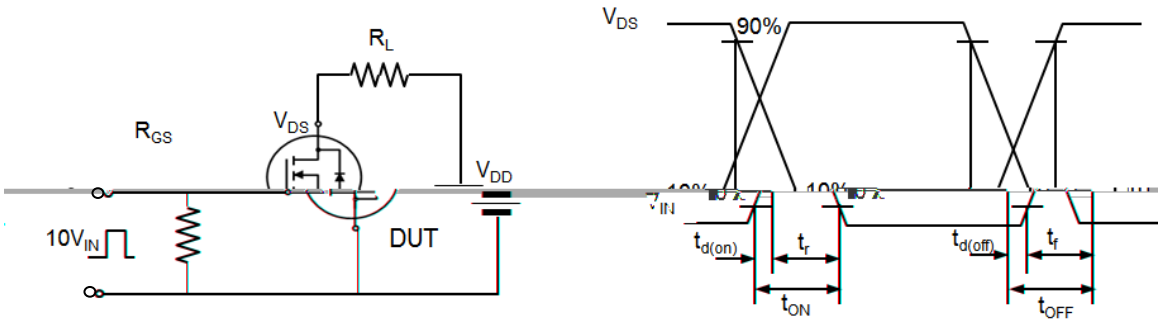


QG-Gate Charge (nC)

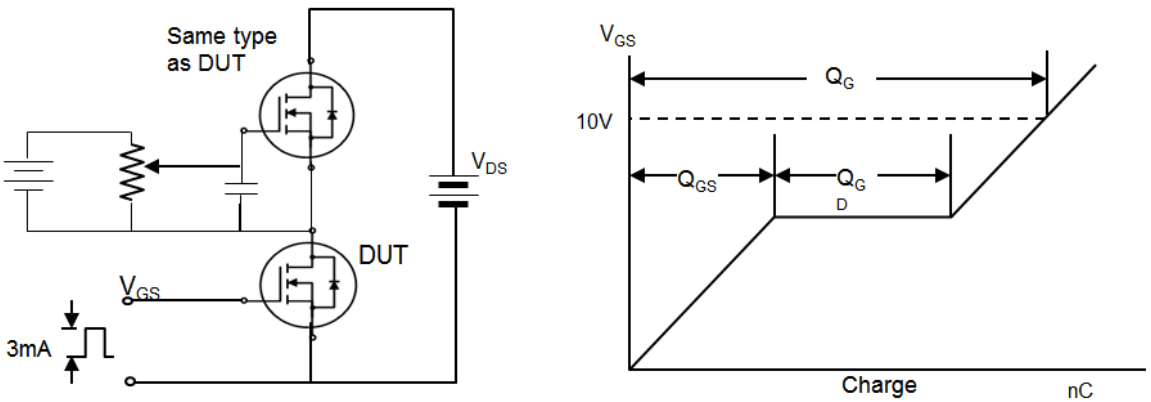
Avalanche Test Circuit



Switching Time Test Circuit



Gate Charge Test Circuit

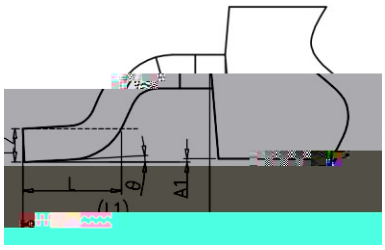


Device Per Unit

Package Type	Unit	Quantity
TO-252-2L	Tube	75
TO-252-2L	Reel	2500

PackageInformation

TO-252-2L



COMMONDIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
A	2.20	2.30	2.40
A1	0.00	-	0.20
A2	0.97	1.07	1.17
b	0.68	0.78	0.90
b3	5.20	5.33	5.50
c	0.43	0.53	0.63
D	5.98	6.10	6.22
D1	5.30REF		
E	6.40	6.60	6.80
E1	4.63	-	-
e	2.286BSC		
H	9.40	10.10	10.50
L	1.38	1.50	1.75
L1	2.90REF		
L2	0.51BSC		
L3	0.88	-	1.28
L4	-	-	1.00
L5	1.65	1.80	1.95
θ	0°	-	8°

Classification Profile

[redacted]ofiles		
Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly

Table 1.SnPb Eutectic Process – Classification Temperatures (Tc)

Package Thickness	Volume mm³ <350	Volume mm³ 1 350
Ø2.5 mm	235	220
≥2.5 mm	220	220

Table 2.Pb-free Process – Classification Temperatures (Tc)

Package Thickness	Volume mm³ <350	Volume mm³ 350-2000	Volume mm³ 1 2000
<1.6 mm	260	260	260
1.6 mm – 2.5 mm	260	250	245
12.5 mm	250	245	245

Reliability Test Program

Test item	Method	Description
SOLDERABILITY	JESD-22, B102	5 Sec, 245
HTRB	JESD-22, A108	168 Hrs /500 Hrs /1000 Hrs, Bias @ 150
PCT	JESD-22, A102	96 Hrs, 100%RH, 2atm, 121
TCT	JESD-22, A104	500 Cycles, -55 ~150

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