

Product Summary

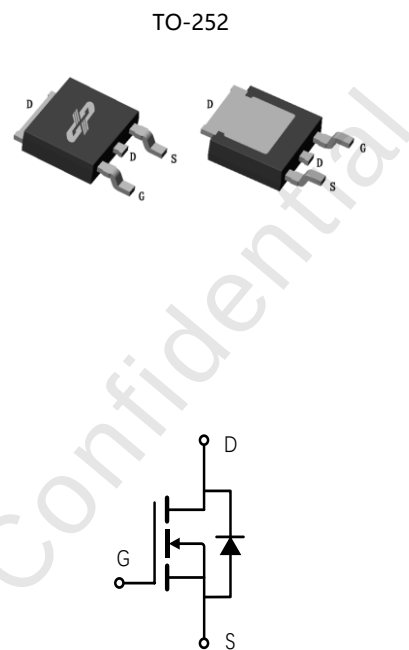
Part #	V_{DS}	$R_{DS(on)}$	I_D ($T_{vj}=25^{\circ}C$)
DPM065R130D3G2	650V	130m Ω	20A

Features

- High Speed Switching with Low Capacitances
- High Blocking Voltage with Low $R_{DS(on)}$
- Easy to parallel
- RoHS Compliant

Applications

- General purpose drives
- Energy storage systems
- String inverter
- Uninterruptible power supplies



Package Marking and Ordering Information

Part #	Marking	Package	Packing
DPM065R130D3G2	M065R130D3	TO-252	Tape/Reel



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	650	V
Continuous drain current	I_D	20	A
$T_C = 25^{\circ}C$		14	
$T_C = 100^{\circ}C$			
Pulsed drain current ($T_C = 25^{\circ}C$, t_p limited by T_{jmax})	$I_{D\ pulse}$	80	A
Gate-source voltage, max. transient voltage	V_{GSmax}	-10/+22	V
Gate-source voltage, max. static voltage	V_{GSop}	0/+15	V
Power dissipation ($T_C = 25^{\circ}C$)	P_{tot}	83	W
Power dissipation ($T_C = 100^{\circ}C$)		42	
Operating junction temperature	T_j	-40...+175	$^{\circ}C$
Storage temperature	T_{stg}	-40...+175	$^{\circ}C$

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – mounting base	R_{thMB}	1.8	$^{\circ}C/W$
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	65	

Electrical Characteristic (at T_j = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Drain-source breakdown voltage	BV_{DSS}	650	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate threshold voltage	$V_{GS(th)}$	2.7	3.3 2.3		V	$V_{DS}=V_{GS}, I_D=3.5mA$ $T_j=25^{\circ}C$ $T_j=175^{\circ}C$
Zero gate voltage drain current	I_{DSS}	-	0.1	20	μA	$V_{DS}=650V, V_{GS}=0V$ $T_j=25^{\circ}C$
Gate-source leakage current	I_{GSS}	-	-	250	nA	$V_{GS}=22V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	160 164	208	m Ω	$V_{GS}=15V, I_D=10A$ $T_j=25^{\circ}C$ $T_j=175^{\circ}C$
		-	130 135	162	m Ω	$V_{GS}=18V, I_D=10A$ $T_j=25^{\circ}C$ $T_j=175^{\circ}C$
Gate resistance	R_g	-	28	-	Ω	$V_{GS}=0V, V_{DS}=0V,$ $f=1MHz$

Dynamic Characteristic^[2]

Input Capacitance	C _{iss}	-	430	-	pF	V _{GS} =0V, V _{DS} =400V, f=1MHz
Output Capacitance	C _{oss}	-	30	-		
Reverse Transfer Capacitance	C _{rss}	-	2.7	-		
Gate Total Charge	Q _g	-	15	-	nC	V _{GS} =0/15V, V _{DS} =400V, I _D =10A, f=1MHz
Gate-Source charge	Q _{gs}	-	5.5	-		
Gate-Drain charge	Q _{gd}	-	2.2	-		
Turn-on delay time	t _{d(on)}	-	22	-	ns	V _{GS} =0/15V, V _{DD} =400V, R _{G_ext} =2.2Ω L=600μH
Rise time	t _r	-	14	-		
Turn-off delay time	t _{d(off)}	-	25	-		
Fall time	t _f	-	14	-		
Turn-On Energy	E _{on}	-	105	-	μJ	
Turn-Off Energy	E _{off}	-	24	-		

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	3.5 3.1		V	$V_{GS}=0V, I_{SD}=5A$ $T_j=25^{\circ}C$ $T_j=175^{\circ}C$
Diode continuous forward current	I_s		17 14	- -	A	$V_{GS}=-4V$ $T_C = 25^{\circ}C$ $T_C = 100^{\circ}C$
Diode Peak reverse recovery Current	I_{rrm}	-	4.8	-	A	
Body Diode Reverse Recovery Time ^[2]	t_{rr}	-	7	-	ns	$V_{GS}=0V, V_R=400V$ $I_{SD}=5A, di/dt=1500A/\mu s$
Body Diode Reverse Recovery Charge ^[2]	Q_{rr}	-	25	-	μC	

[2]. Defined by design. Not subject to production test

Typical Performance Characteristics

Fig 1: Output Characteristics $T_j = -55^\circ\text{C}$

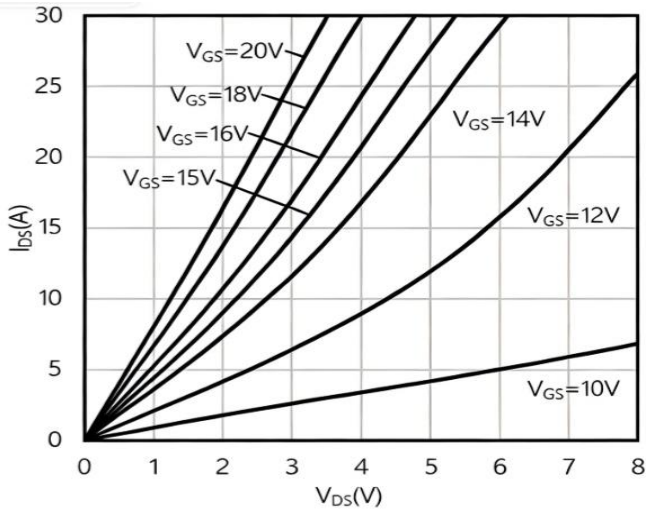


Fig 2: Output Characteristics $T_j = 25^\circ\text{C}$

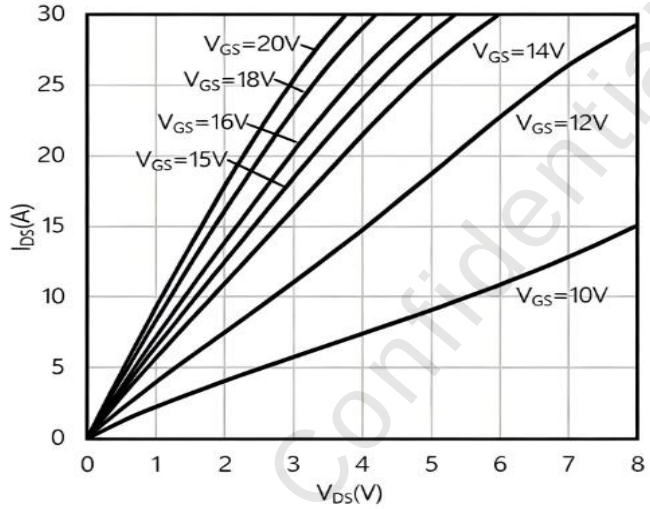


Fig 3: Output Characteristics $T_j = 175^\circ\text{C}$

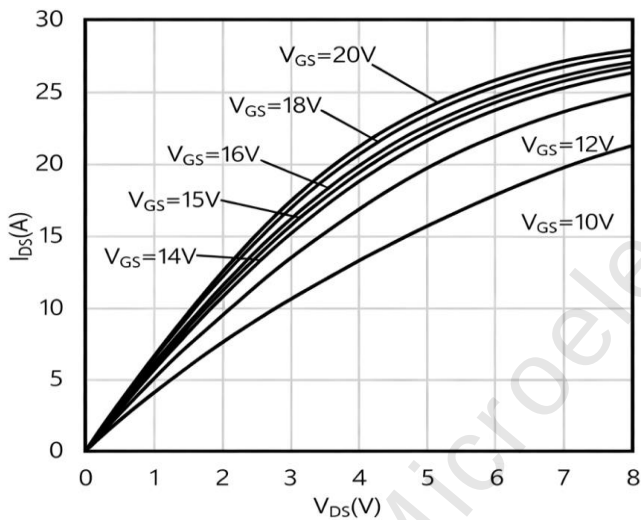


Fig 4: $R_{ds(on)}$ vs Drain Current for various Temperature

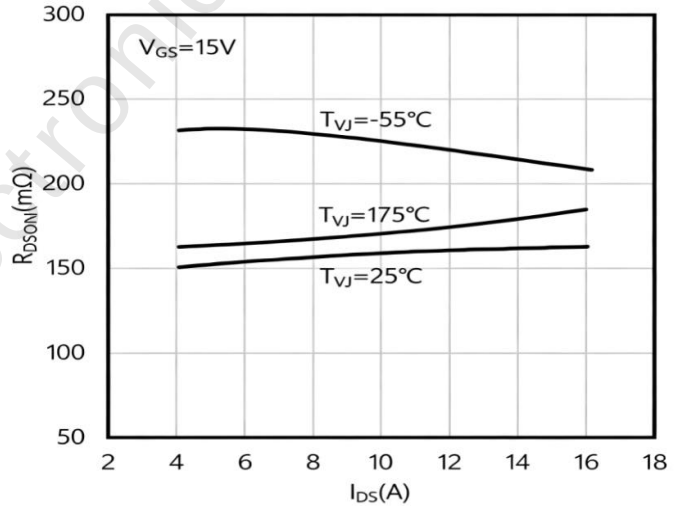


Fig 5: $R_{ds(on)}$ vs. Temperature

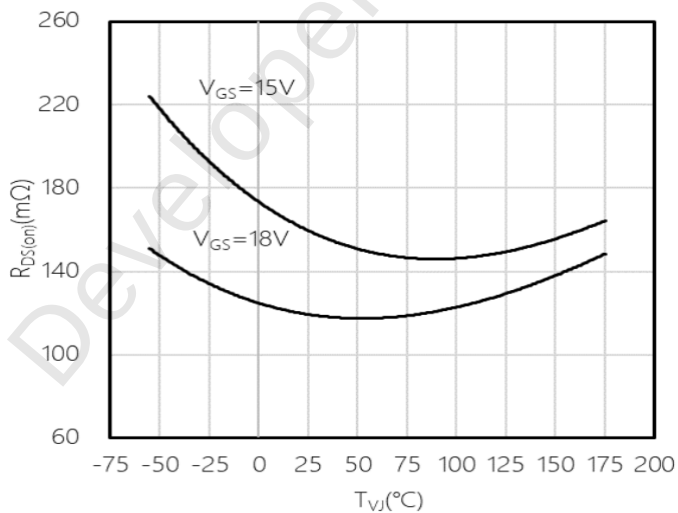
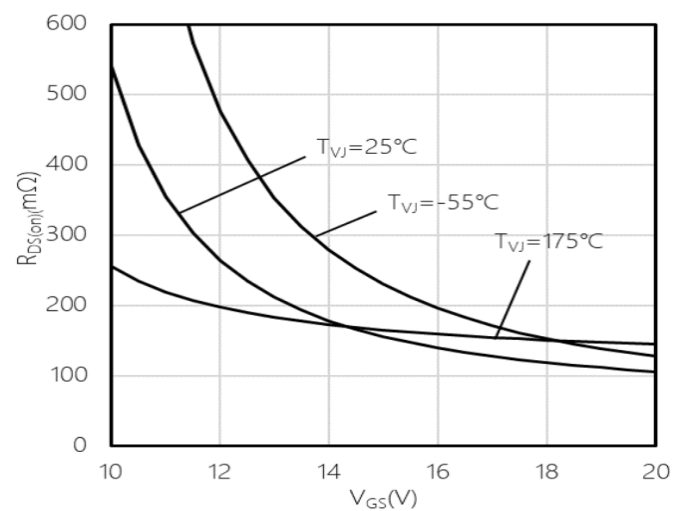


Fig 6: $R_{ds(on)}$ vs. Gate Voltage at Temperature



Typical Performance Characteristics

Fig 7: Transfer Characteristics

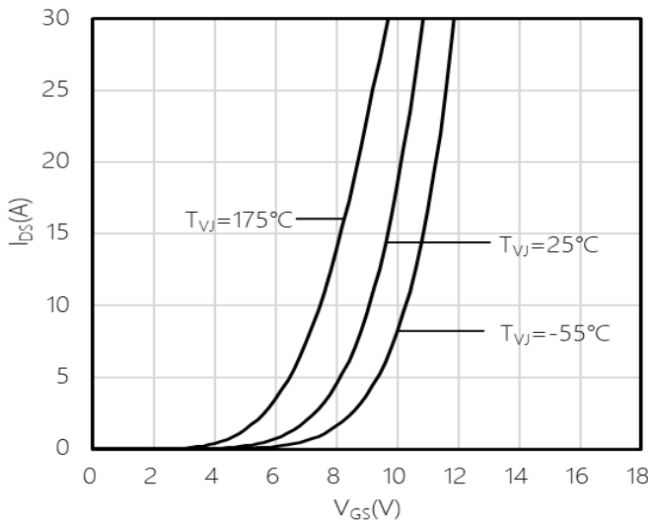


Fig 8: Typical reverse drain current as function of reverse drain voltage. $T_{vj} = -55^{\circ}\text{C}$

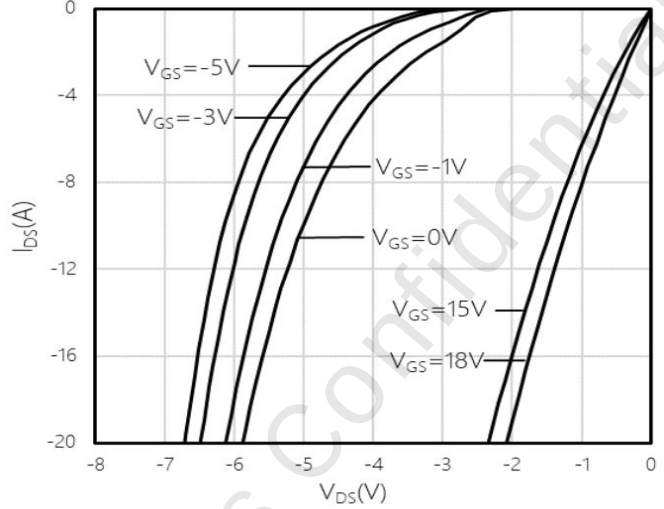


Fig 9: Typical reverse drain current as function of reverse drain voltage. $T_{vj} = 25^{\circ}\text{C}$

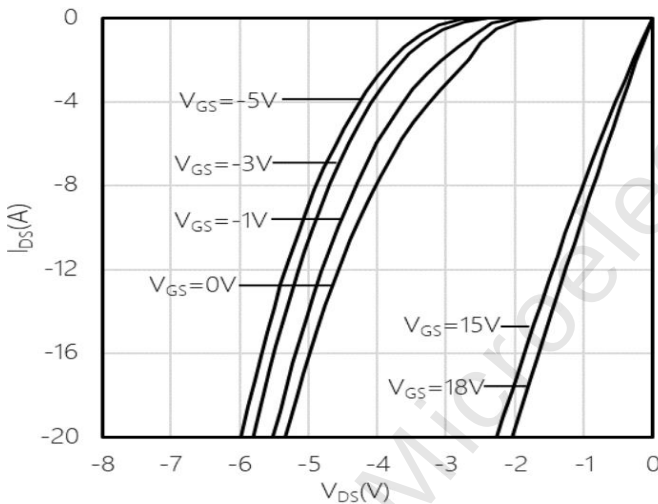


Fig 10: Typical reverse drain current as function of reverse drain voltage. $T_{vj} = 175^{\circ}\text{C}$

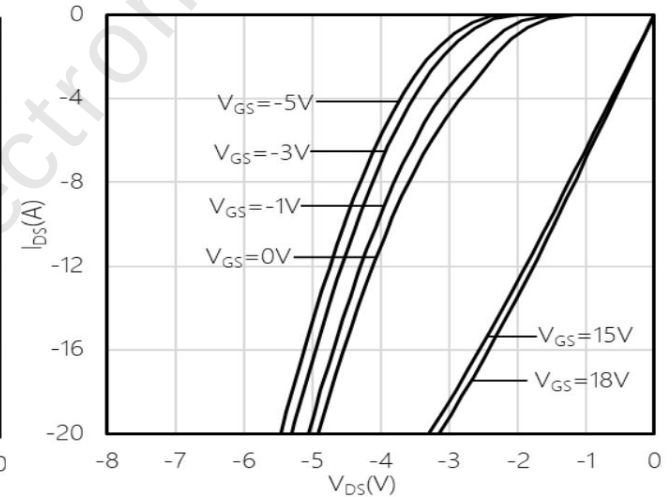


Fig 11: Threshold Voltage vs. Temperature

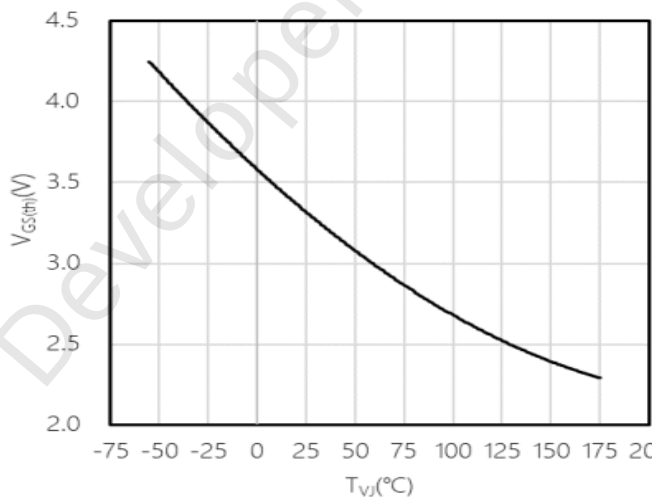


Fig 12: Capacitance Characteristics

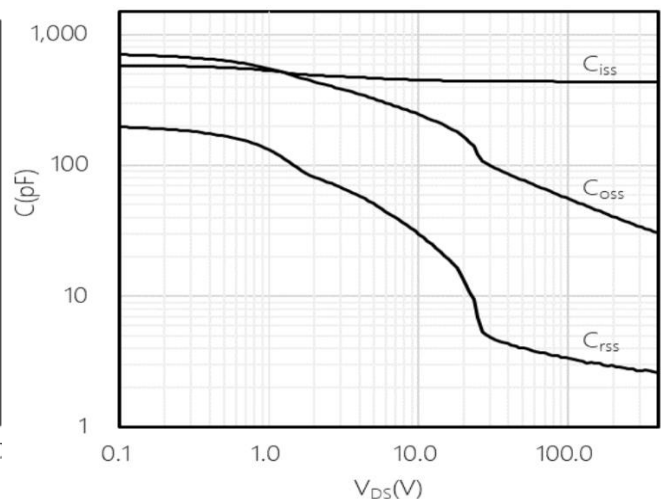


Fig 13: Gate Charge Characteristics

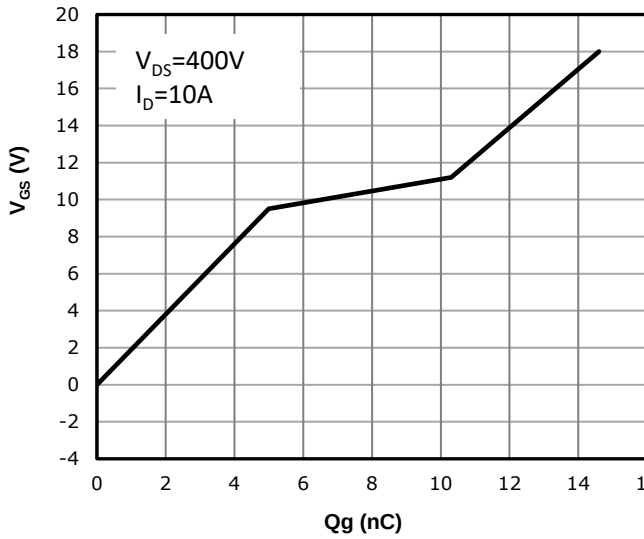


Fig 14: Clamped Inductive Switching energy vs R_g

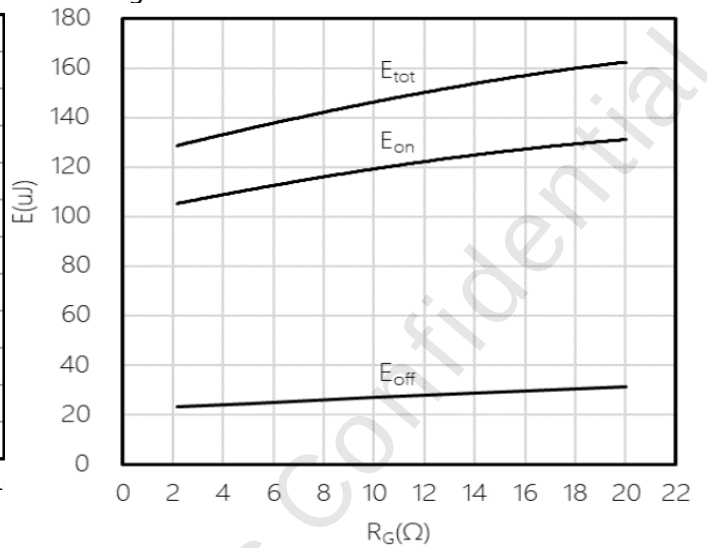


Fig 15: Power Dissipation

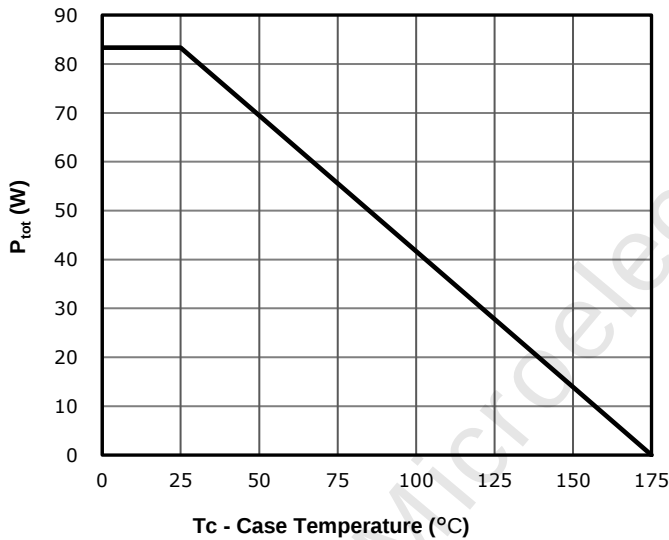


Fig 16: Drain Current Derating

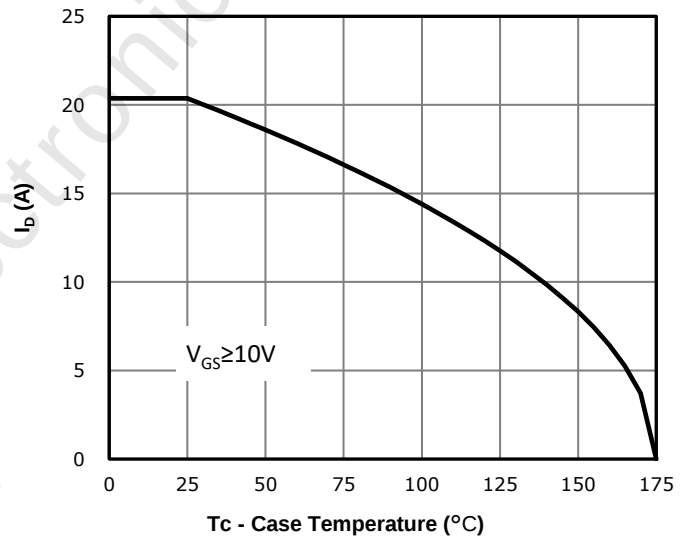


Fig 17: Safe Operating Area

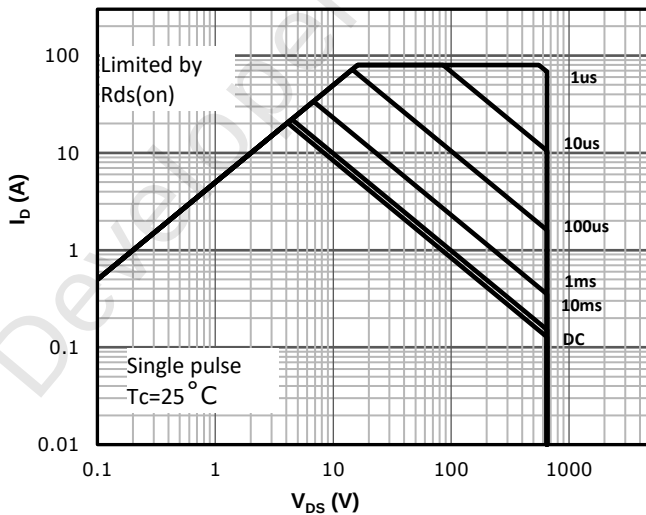
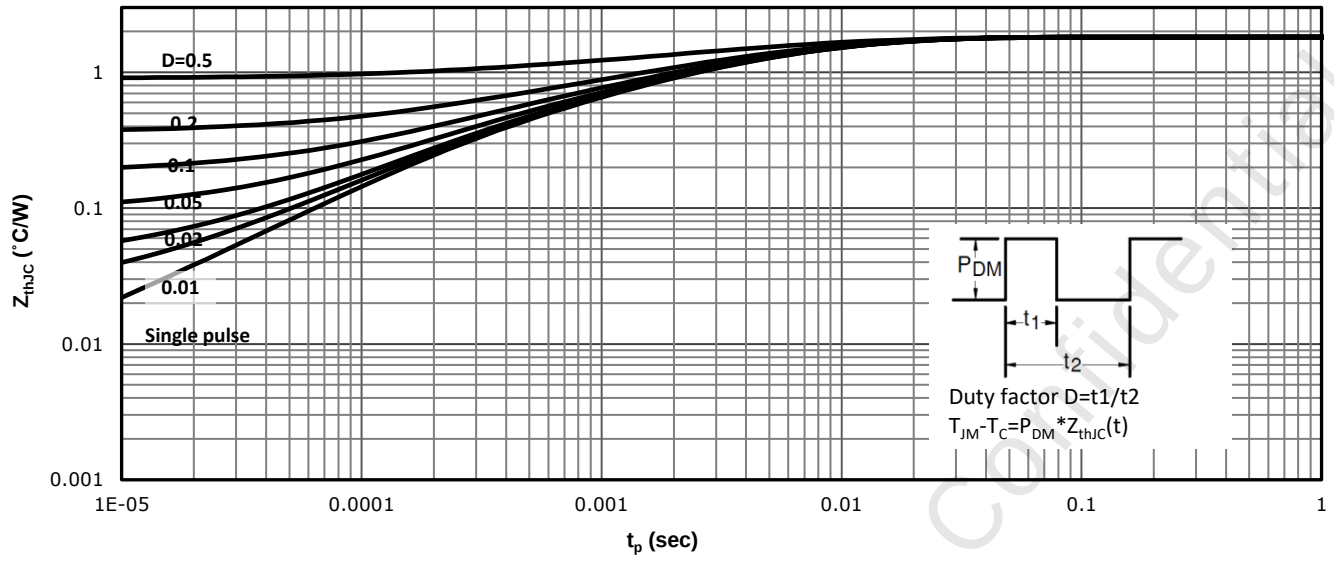
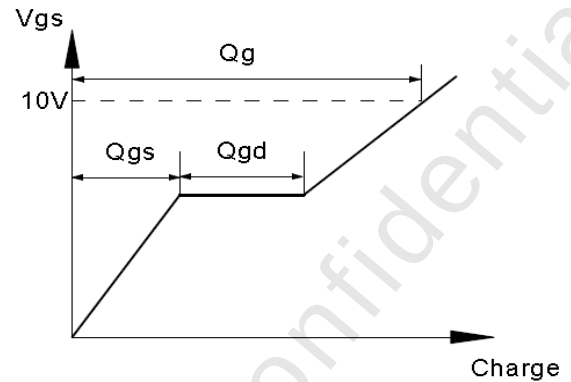
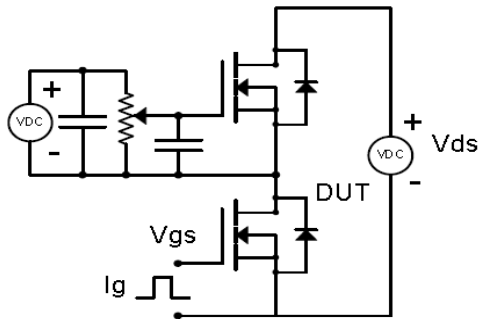


Fig 18: Max. Transient Thermal Impedance

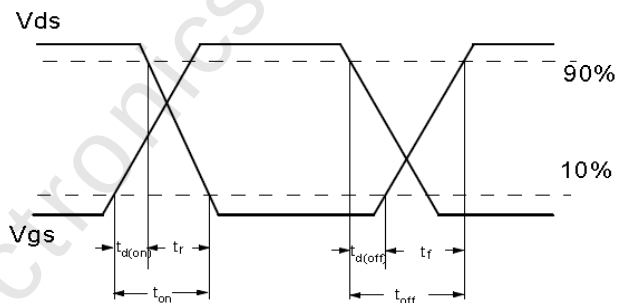
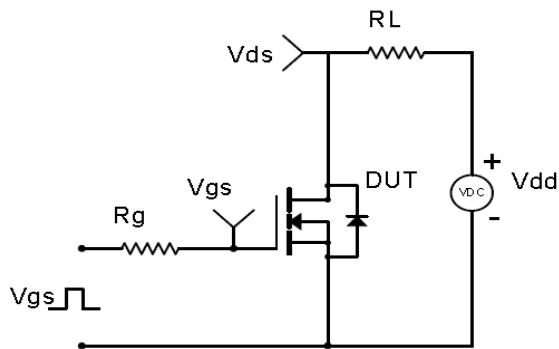


Test Circuit & Waveform

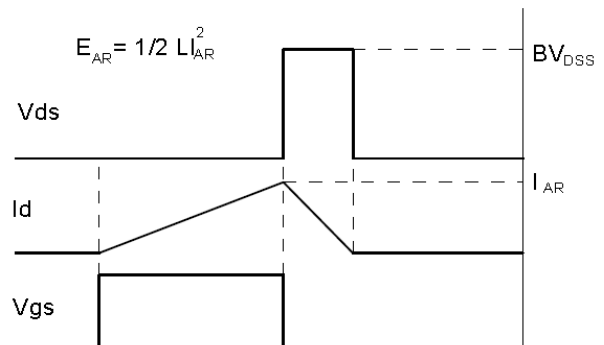
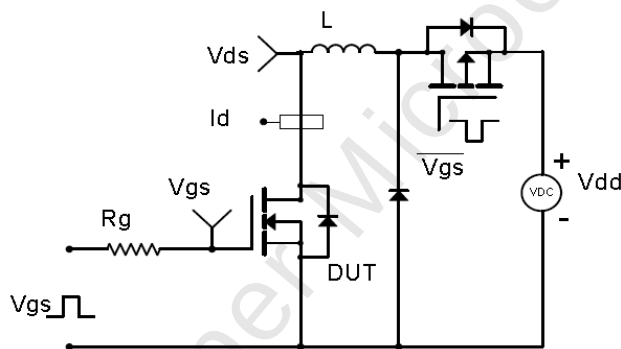
Gate Charge Test Circuit & Waveform



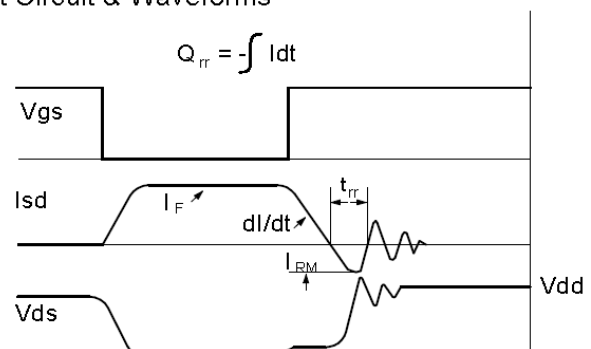
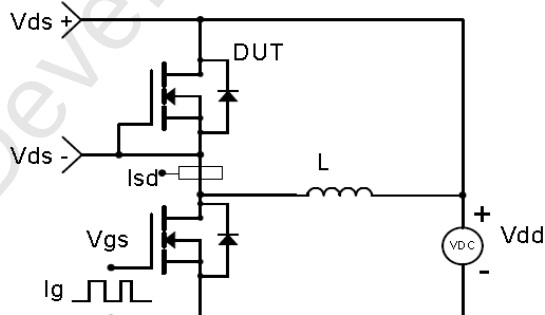
Resistive Switching Test Circuit & Waveforms



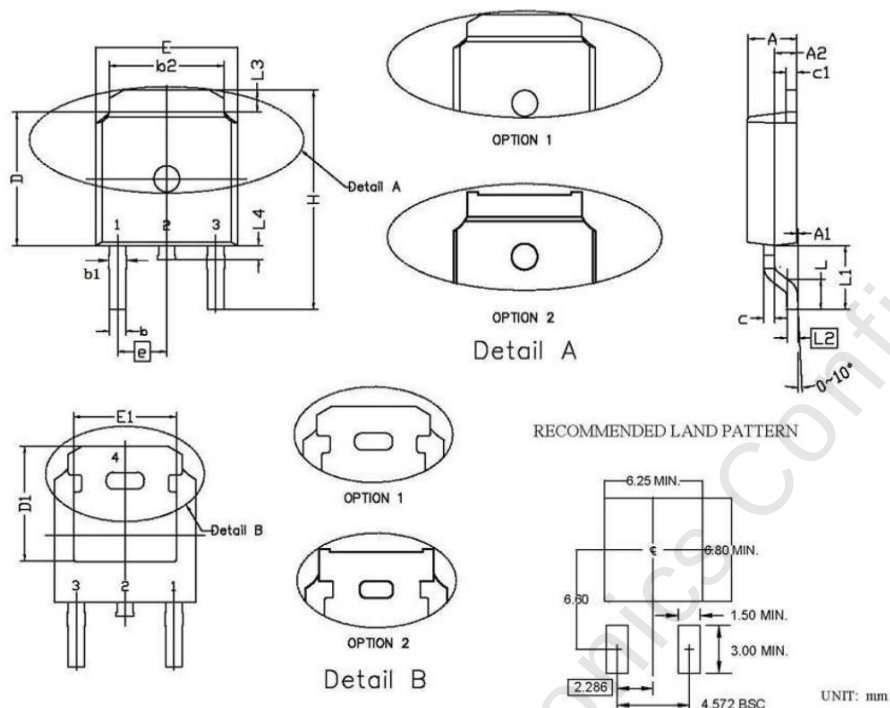
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

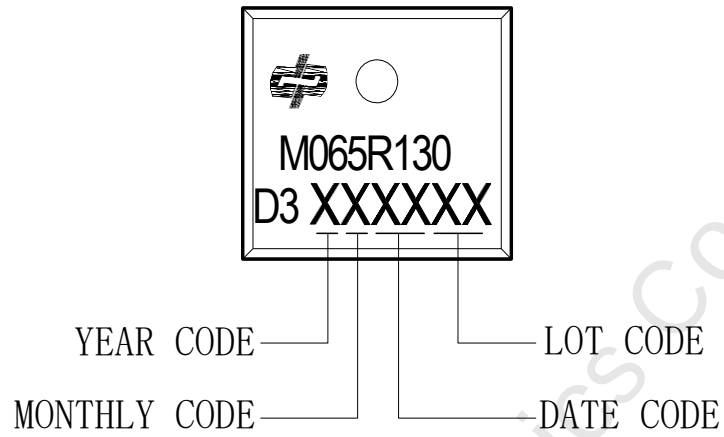


Package Outline: TO252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.15	2.45	0.085	0.096
A1	0.00	0.15	0.000	0.006
A2	0.76	1.36	0.030	0.054
b	0.60	0.91	0.024	0.036
b1	0.65	1.15	0.026	0.045
b2	5.00	5.64	0.197	0.222
c	0.45	0.61	0.018	0.024
c1	0.36	0.66	0.014	0.026
D	5.80	6.30	0.228	0.248
D1	5.00	6.00	0.197	0.236
e	2.29 BSC.		0.090 BSC.	
E	6.30	6.90	0.248	0.272
E1	4.55	5.30	0.179	0.209
H	9.40	10.48	0.370	0.413
L	1.18	1.70	0.046	0.067
L1	2.92 REF		0.115 REF	
L2	0.36	0.66	0.014	0.026
L3	0.72	1.35	0.028	0.053
L4	0.60	1.20	0.024	0.047

Part Marking Information



Revision History

Revision	Major changes
1.1	Release for formal version1.1

重要声明Important Notice

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