

# PM007N100DG

100V 140A 4.4mΩ Si Single N-ch Enhancement Mode Power MOSFET with Normal Diode

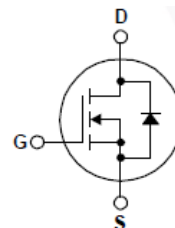
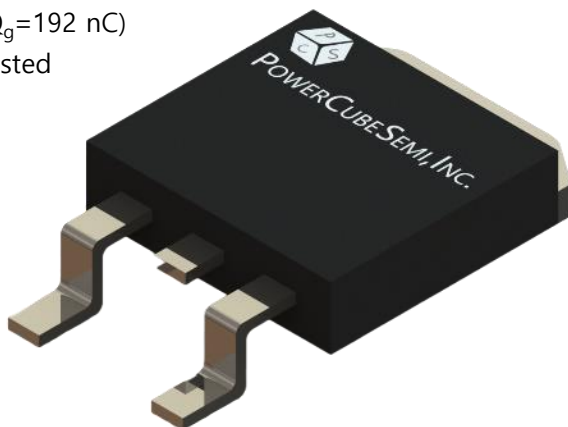
## Features

### Si Single N-ch Enhancement Mode Power MOSFET

- Rated to 100V at 140Amps @ $T_j = 25^{\circ}\text{C}$
- Max  $R_{DS(on)} = 7.5\text{ m}\Omega$
- Typ  $R_{DS(on)} = 5.6\text{ m}\Omega$
- Gate Charge(Typ.  $Q_g=192\text{ nC}$ )
- 100% Avalanche Tested

## Application

- Power Switch
- DC/DC Converter



PKG type : TO-263 (D2PAK)

## Description

The PM007N100DG uses advanced trench Technology to provide excellent  $R_{DS(ON)}$ , low gate charge. it can be used in a wide variety of applications.

## Absolute Maximum Ratings

Symbol	Parameter	Test Condition	Value	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	V
$I_D$	Drain Current	$T_c=25^{\circ}\text{C}$	140	A
$I_{DM}$	Pulsed Drain Current	Pulse width limited by junction temperature	560	A
$V_{GS}$	Gate-Source Voltage		$\pm 20$	V
$E_{AS}$	Single Pulsed Avalanche Energy	$V_{DD}=50V, V_{GS}=10V, L=0.5mH, R_G=25\Omega$	361	mJ
$P_d$	Power Dissipation	$T_c=25^{\circ}\text{C}$	236	W
$T_j$	Operating Junction Temperature		150	$^{\circ}\text{C}$
$T_{stg}$	Storage Temperature		-55 to 150	$^{\circ}\text{C}$

## Package Marking and Ordering Information

Device Marking	Device	Package	Packing Method	Tape width	Quantity
PM007N100DG	PM007N100	TO-263	REEL	-	800

## Electrical Characteristics of Si MOSFET

Symbol	Parameter	Test Condition	Numerical			Unit
			Min	Typ.	Max.	
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A, T_J = 25^\circ C$	100	-	-	V
$I_{DSS}$	Zero gate voltage drain current	$V_{DS} = 100V, V_{GS} = 0V$	-	-	1	$\mu A$
$I_{GSS}$	Gate-source leakage current	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	$\pm 100$	nA
$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	1.7	2.5	V
$R_{DS(ON)}$	Static drain-source on state resistance	$V_{GS} = 10V, I_D = 30A$	-	5.6	7.5	m $\Omega$
$g_{FS}$	Forward transconductance	$V_{DS} = 5V, I_D = 30A$	-	59	-	S
$t_{d(on)}$	Turn-on Delay time	$V_{DS} = 50V, I_D = 30A, R_G = 4.7\Omega$	-	32	-	ns
$T_r$	Turn-on Rise time		-	118	-	
$t_{d(off)}$	Turn-off Delay time		-	80	-	
$T_f$	Turn-off Fall time		-	27	-	



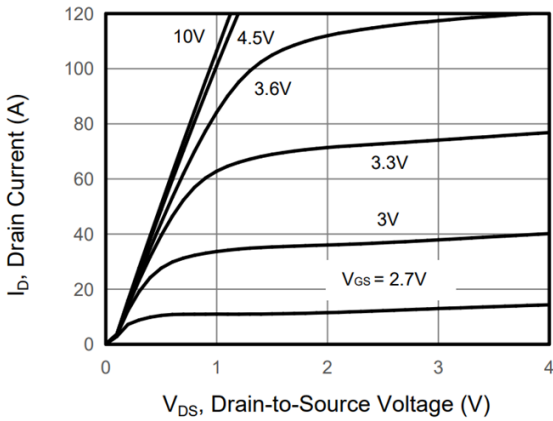
## Electrical Characteristics of Si MOSFET

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
$R_{\theta JC}$	Thermal resistance, Junction to case		0.53	-	$^{\circ}\text{C}/\text{W}$
$C_{iss}$	Input capacitance	$V_{DS} = 50\text{V}, V_{GS} = 0\text{V},$ $f = 1.0\text{MHz}$	13950	-	pF
$C_{oss}$	Output capacitance		432	-	
$C_{rss}$	Reverse transfer capacitance		362	-	
$Q_{g(\text{tot})}$	Total gate charge at 10V	$V_{DS} = 50\text{V}, I_D = 30\text{A}$ $V_{GS(\text{on})} = 10\text{V}$	192	-	nC
$Q_{gs}$	Gate to source gate charge		49	-	
$Q_{gd}$	Gate to drain "Miller" charge		23	-	

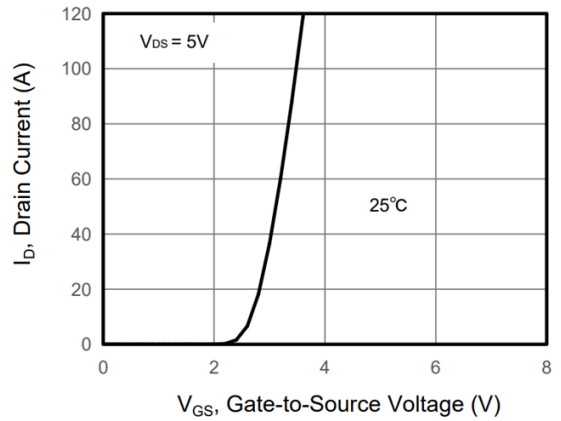
## Electrical Characteristics of Si Diode

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
$I_S$	Maximum continuous drain to source diode forward current		-	140	A
$V_{SD}$	Drain to source diode forward voltage	$I_S = 30\text{A}, V_{GS} = 0\text{V}$	-	1.2	V
$T_{rr}$	Reverse recovery time	$I_F = 30\text{A}, V_{GS} = 0\text{V},$ $dI_F/dt = 100\text{A}/\mu\text{s}$	96	-	ns
$Q_{rr}$	Reverse recovery charge		212	-	nC

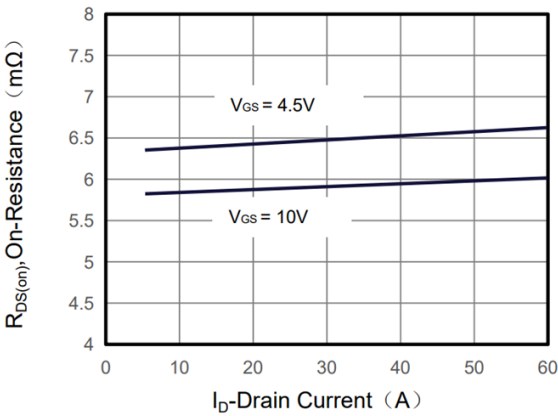
# Typical Characteristics



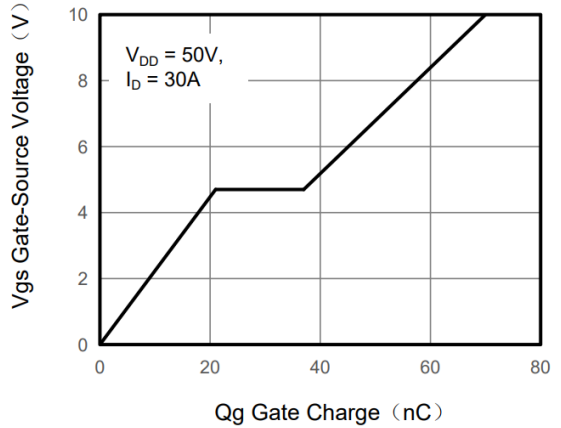
**Figure 1. Output Characteristics**



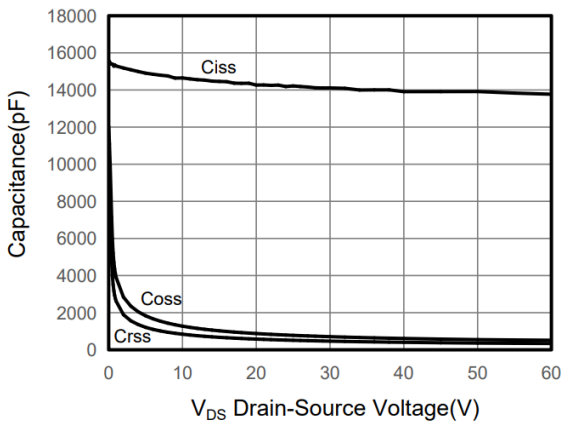
**Figure 2. Transfer Characteristics**



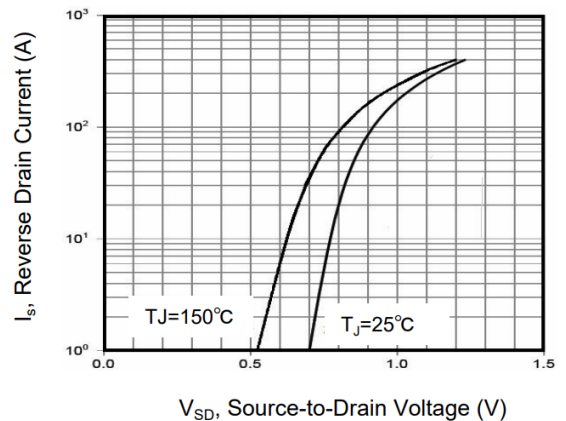
**Figure 3. Drain to Source On-Resistance**



**Figure 4. Gate Charge**



**Figure 5. Capacitance Characteristics**



**Figure 6. Source to Drain Diode Forward**

# Typical Characteristics

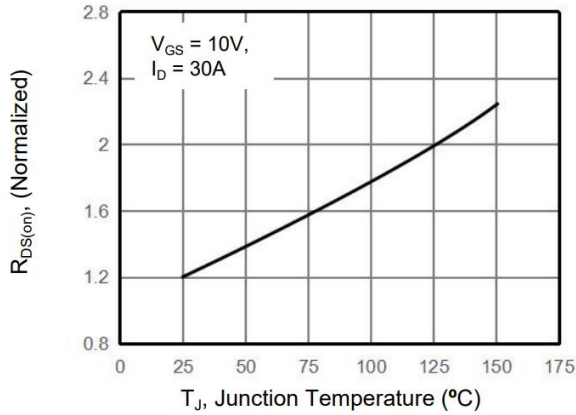


Figure 7. Drain to Source On-Resistance

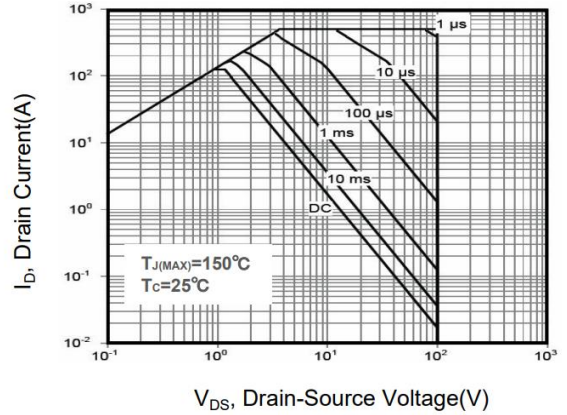


Figure 8. Safe Operation Area

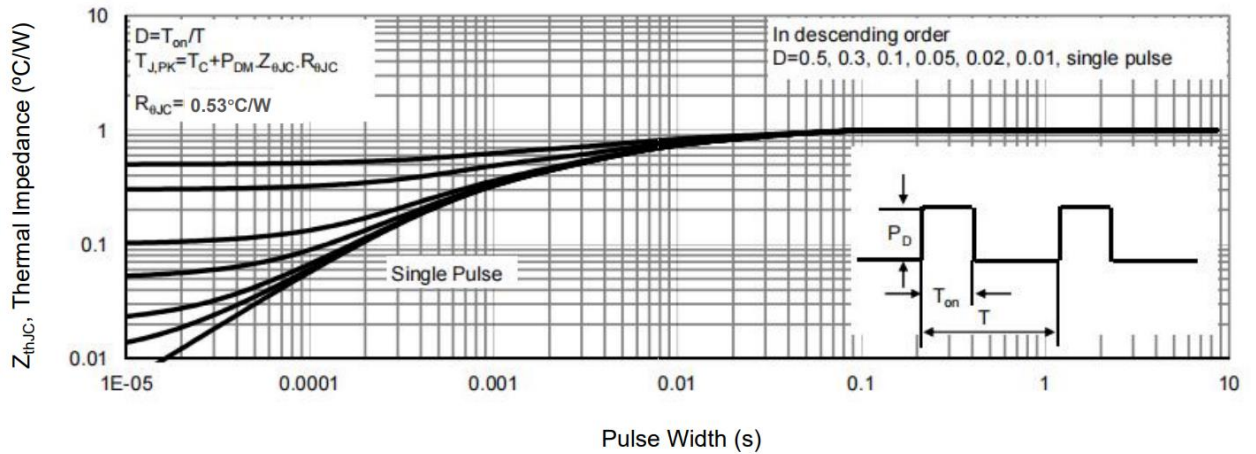
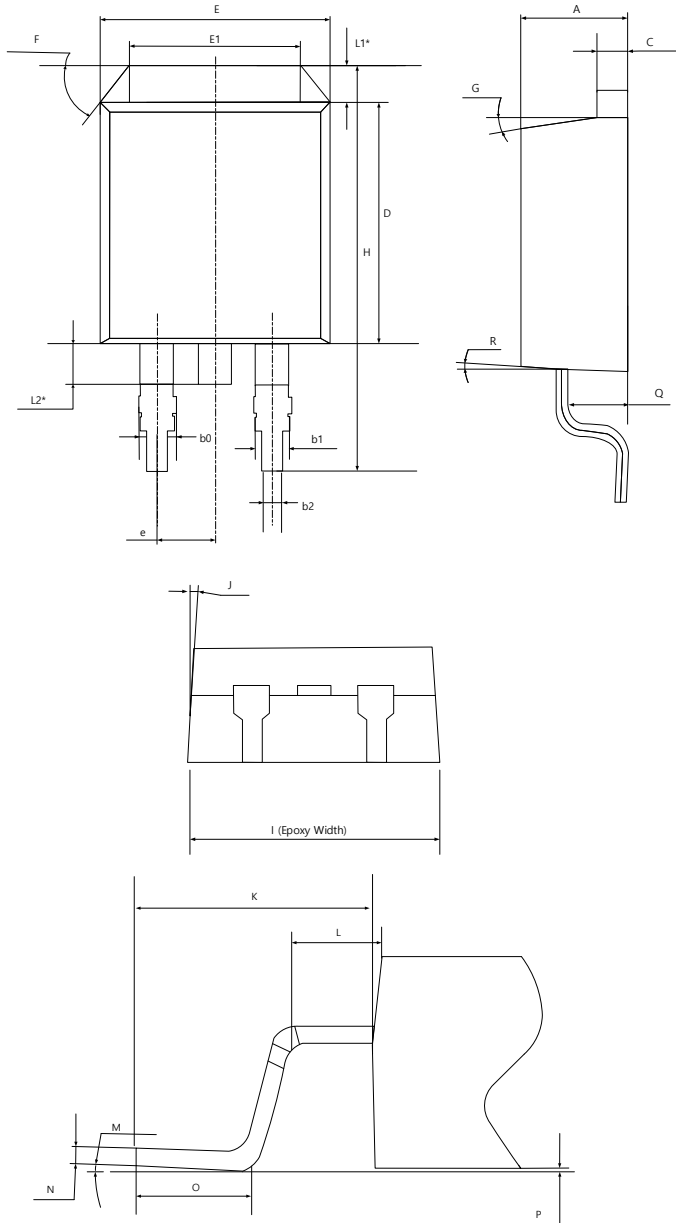


Figure 9. Normalized Maximum Transient Thermal Impedance

## Package Outline

Unit : mm



SYMBOL	DIMENSIONS		
	MIN	NOM	MAX
A	4.40	4.60	4.80
b0	1.17	1.37	1.57
b1	1.17	1.27	1.37
b2	0.70	0.80	0.90
C	1.17	1.27	1.37
D	8.50	8.70	8.90
E	9.80	10.00	10.20
E1	6.50	-	-
e	2.44	2.54	2.64
F	-	30° (Ref)	-
G	-	7.0°	-
H	15.00	15.30	15.60
I	9.80	10.00	10.20
J	-	3.0°	-
K	5.00	5.30	5.60
L	1.80	2.00	2.20
L1	1.07	1.27	1.47
L2	1.20	1.50	1.80
M	0.0°	-	8.0°
N	0.30	0.45	0.60
O	2.34	2.54	2.74
P	0	-	0.25
Q	2.37	2.67	2.97
R	-	7.0°	-