

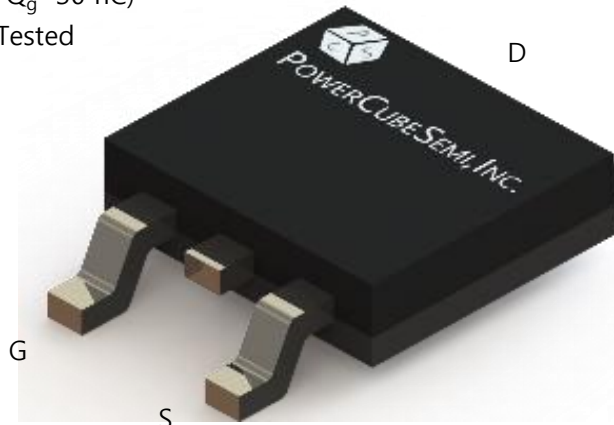
# PM054P100CG

-100V -30A 54mΩ Si Single P-ch Enhancement Mode MOSFET with Normal Diode

## Features

### Si P-Ch Enhancement Mode Power MOSFET

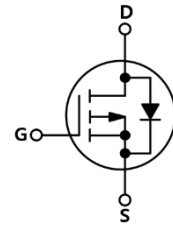
- Rated to -100V at -30Amps @ $T_j = 25^\circ\text{C}$
- Max  $R_{DS(on)} = 54\text{ m}\Omega$
- Typ  $R_{DS(on)} = 45\text{ m}\Omega$
- Gate Charge(Typ.  $Q_g=36\text{ nC}$ )
- 100% Avalanche Tested



PKG type : TO-252 (DPAK)

## Application

- Power switch
- DC/DC converters



## Description

The PM054P100CG 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	$T_c=25^\circ\text{C}$	-30	A
$I_{DM}$	Drain current	Pulse width limited by junction temperature	-120	A
$V_{GS}$	Gate-source voltage		$\pm 20$	V
$E_{AS}$	Single pulsed avalanche energy	$V_{GS}=-10V, R_G=25\Omega$ $V_{DD}=-50V, L=0.5mH$	64	mJ
$P_d$	Power dissipation	$T_c=25^\circ\text{C}$	98	W
$T_j$	Operating junction		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
PM054P100CG	PM054P100	TO-252	REEL	-	2500

## 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	$V_{GS} = \pm 20V$	-	-	$\pm 100$	nA
$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.5	-2.0	-2.5	V
$R_{DS(on)}$	Static drain-source on state resistance	$V_{GS} = -10V, I_D = -10A$	-	45	54	m $\Omega$
		$V_{GS} = -4.5V, I_D = -10A$	-	54	64	
$g_{FS}$	Forward transconductance	$V_{DS} = -5V, I_D = -10A$	-	32	-	S
$t_{d(on)}$	Turn-on Delay time	$V_{DD} = -50V, I_D = -10A, R_G = 6\Omega$	-	12	-	ns
$t_r$	Turn-on Rise time		-	35	-	
$t_{d(off)}$	Turn-off Delay time		-	89	-	
$t_f$	Turn-off Fall time		-	94	-	

## Electrical Characteristics of Si MOSFET

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
$R_{\theta JC}$	Thermal resistance, Junction to case		1.27	-	$^{\circ}\text{C}/\text{W}$
$C_{iss}$	Input capacitance	$V_{DS} = -50\text{V}, V_{GS} = 0\text{V},$ $f = 1.0\text{MHz}$	1861	-	pF
$C_{oss}$	Output capacitance		170	-	
$C_{rss}$	Reverse transfer capacitance		12	-	
$Q_{g(\text{tot})}$	Total gate charge at 10V	$V_{DD} = -50\text{V}, I_D = -10\text{A}$ $V_{GS} = -10\text{V}$	36	-	nC
$Q_{gs}$	Gate to source gate charge		17	-	
$Q_{gd}$	Gate to drain "Miller" charge		7	-	

## Electrical Characteristics of Si Diode

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
$I_S$	Maximum continuous drain to source diode forward current	$T_c = 25^{\circ}\text{C}$	-	-30	A
$V_{SD}$	Drain to source diode forward voltage	$I_{SD} = -10\text{A}, V_{GS} = 0\text{V}$	-	-1.2	V
$T_{rr}$	Reverse recovery time	$I_F = -10\text{A}, V_{GS} = 0\text{V},$ $di_F/dt = -100\text{A}/\mu\text{s}$	93	-	ns
$Q_{rr}$	Reverse recovery charge		249	-	nC

# Typical Characteristics

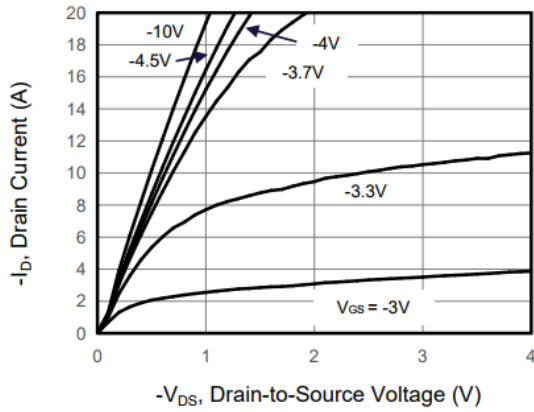


Figure 1. Output Characteristics

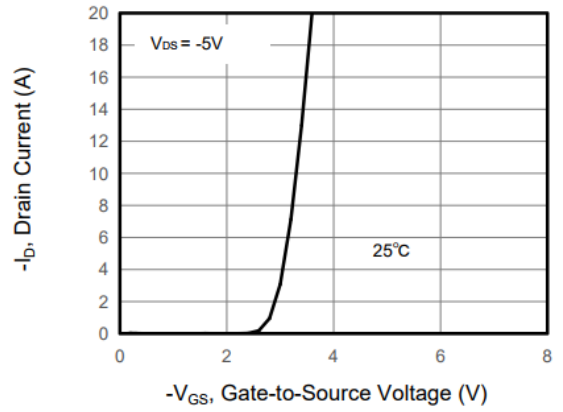


Figure 2. Transfer Characteristics

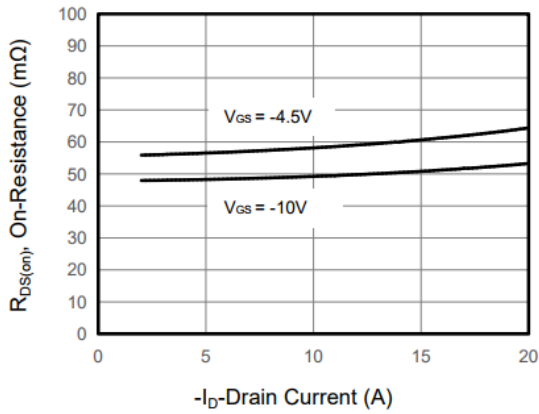


Figure 3. Drain Source On Resistance

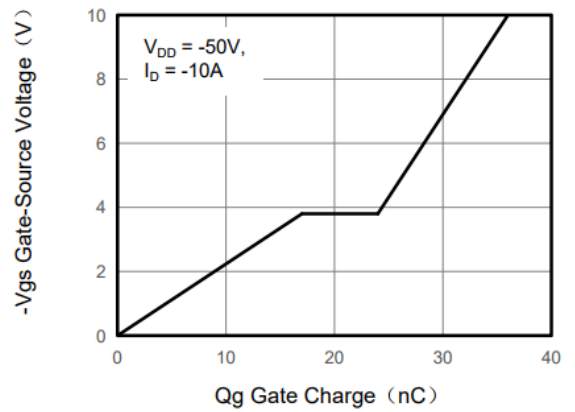


Figure 4. Gate Charge

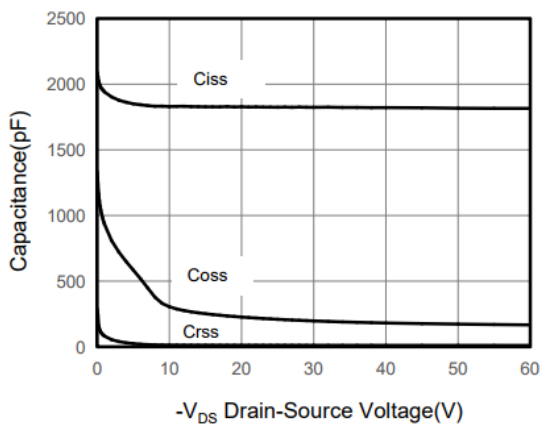


Figure 5. Capacitance

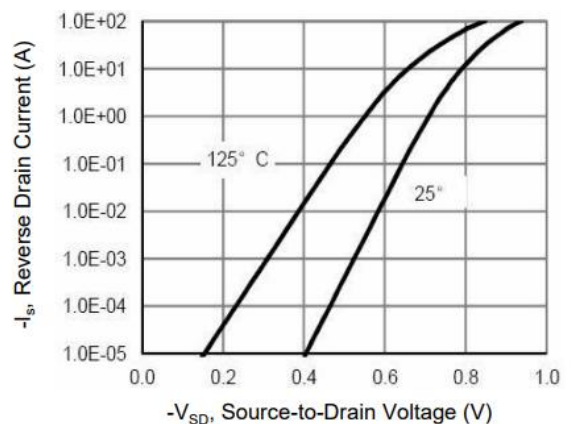


Figure 6. Source-Drain Diode Forward

# Typical Characteristics

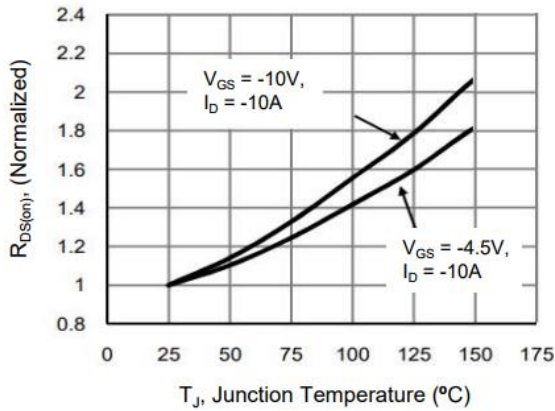


Figure 7. Drain-Source On-Resistance

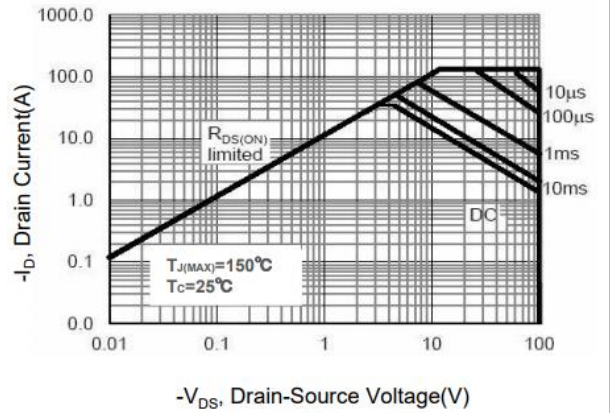


Figure 8. Safe Operation Area

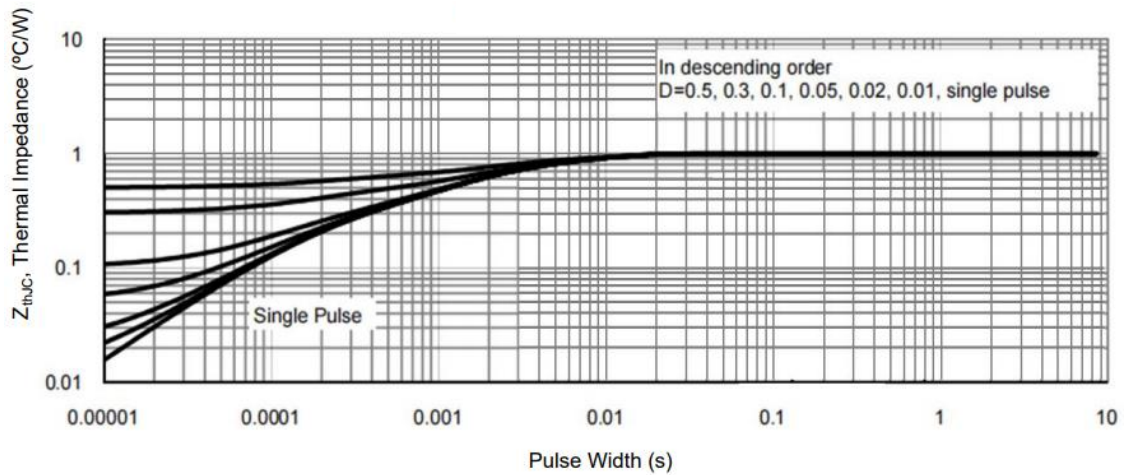
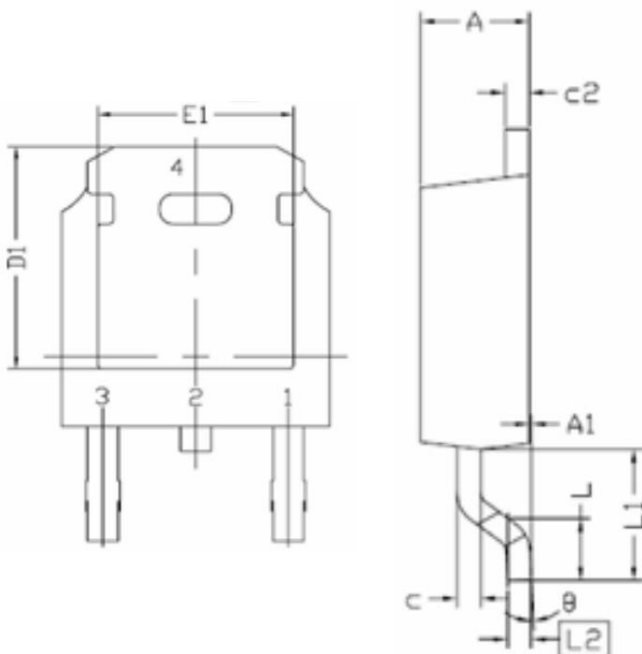
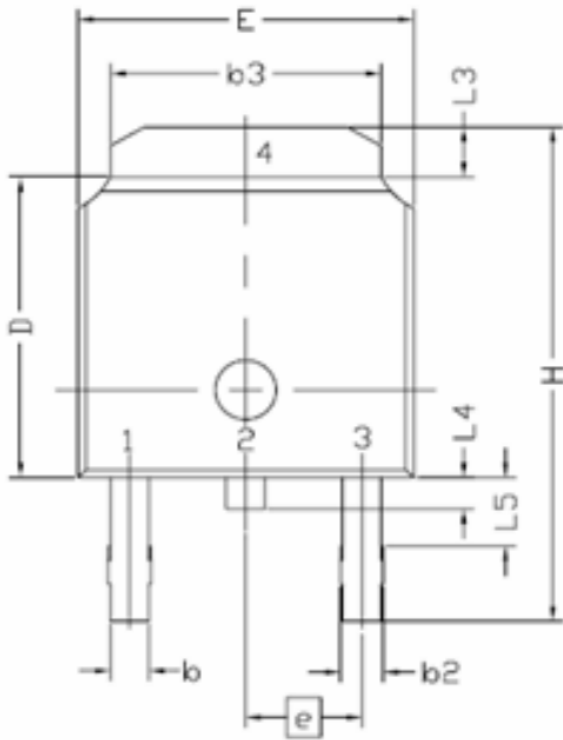


Figure 9. Normalized Maximum Transient Thermal Impedance

**Package Outline**

Unit : mm



SYMBOL	DIMENSIONS		
	MIN	NOM	MAX
E	6.34	6.54	6.74
L	1.30	1.60	1.90
L1	2.60	2.90	3.20
L2	0.5 BSC		
L3	0.82	1.02	1.22
L4	0.80	1.00	1.20
L5	2.60	2.90	3.20
D	5.80	6.10	6.40
H	8.40	9.00	9.60
b	1.42	1.52	1.62
b2	2.35	2.55	2.75
b3	5.20	5.30	5.40
e	4.58 BSC		
A	2.08	2.28	2.48
A1	0.00	0.15	-
c	0.40	0.50	0.60
c2	0.40	0.50	0.60
D1	-	5.25	-
E1	-	4.8	-
$\theta$	0.00°	10.00°	