

# PGT075N030G

30V 271A 0.75mΩ Si N-channel Enhancement Mode Split gate MOSFET

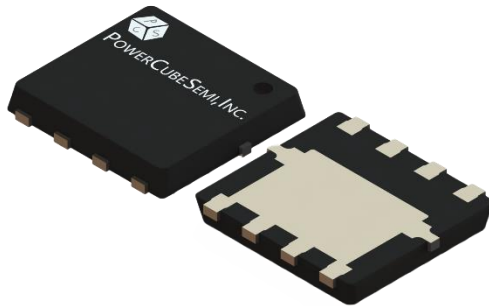
## Features

### Si N channel Enhancement Mode Split gate MOSFET

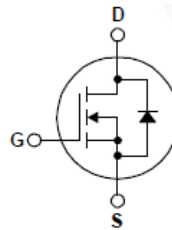
- Rated to 30V at 271Amps @ $T_C = 25^\circ\text{C}$
- Max  $R_{DS(on)} = 0.85\text{ m}\Omega$
- Gate Charge(Typ.  $Q_G=194\text{ nC}$ )
- Advanced Trench Cell Design
- Low Thermal Resistance
- MSL1

## Application

- Motor Drivers
- DC-DC Converter



PKG type : PDFN5060-8L



## Absolute Maximum Ratings

$T_C=25^\circ\text{C}$  Unless Otherwise Noted

Symbol	Parameter	Test Condition	Value	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	V
$I_D^*$	Drain Current	$V_{GS}=10V, T_C=25^\circ\text{C}$	271	A
$I_{DM}^{*,**}$	Pulsed Drain Current	$V_{GS}=10V, T_C=25^\circ\text{C}$	1084	A
$V_{GS}$	Gate-Source Voltage	$T_C=25^\circ\text{C}$	$\pm 20$	V
$E_{AS}^*$	Single Pulsed Avalanche Energy	$V_{DD}=50V, L=1.0\text{mH}$	1058	mJ
$P_D^*$	Power Dissipation	$T_C=25^\circ\text{C}$	113	W
$T_J$	Junction Temperature		175	$^\circ\text{C}$
$T_{stg}$	Storage Temperature		-55 to 175	$^\circ\text{C}$
$R_{\theta JA}^*$	Thermal Resistance – Junction to Ambient		41.4	$^\circ\text{C}/\text{W}$
$R_{\theta JC}^*$	Thermal Resistance – Junction to Case		1.1	$^\circ\text{C}/\text{W}$

### Note :

\* Surface Mounted on 1 in<sup>2</sup> pad area,  $t \leq 10\text{ sec.}$

\*\* Pulse Width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$

\*\*\* Limited by bonding wire

## Electrical Characteristics $T_C=25^\circ\text{C}$ Unless Otherwise Noted

### Static Characteristics

Symbol	Parameter	Test Condition	Numerical			Unit
			Min	Typ.	Max.	
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	30	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.2	-	2.0	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS} = 24V, V_{GS} = 0V$	-	-	1	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	$\pm 100$	nA
$R_{DS(ON)}$	Static Drain-Source on state Resistance	$V_{GS} = 10V, I_D = 50A$	-	0.75	0.85	m $\Omega$

### Dynamic Characteristics

Symbol	Parameter	Test Condition	Numerical			Unit
			Min	Typ.	Max.	
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=15V, f=1\text{MHz}$	-	11055	-	pF
$C_{oss}$	Output Capacitance		-	1276	-	
$C_{rss}$	Reverse Transfer Capacitance		-	476	-	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=15V, V_{GEN}=10V, R_G=4.5\Omega, R_L=0.3\Omega, I_{DS}=50A$	-	27	-	ns
$T_r$	Turn-On Rise Time		-	97	-	
$T_{d(off)}$	Turn-Off Delay Time		-	155	-	
$T_f$	Turn-Off Rise Time		-	106	-	

### Gate Charge Characteristics

Symbol	Parameter	Test Condition	Numerical			Unit
			Min	Typ.	Max.	
$Q_G$	Total Gate Charge	$V_{DS}=15V, V_{GS}=10V, I_{DS}=50A$	-	194	-	nC
$Q_{GS}$	Gate-Source Charge		-	42	-	
$Q_{GD}$	Gate-Drain Charge		-	33	-	

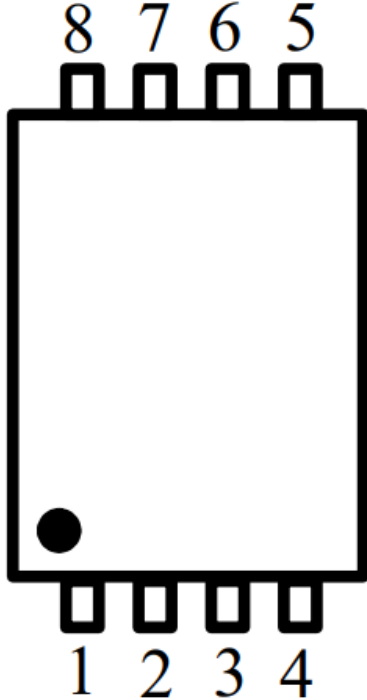
### Diode Characteristics

Symbol	Parameter	Test Condition	Numerical			Unit
			Min	Typ.	Max.	
$V_{SD}$	Diode Forward Voltage	$I_{SD}=50A, V_{GS}=0V$	-	-	1.3	V
$T_{rr}$	Reverse Recovery Time	$I_{DS}=40A, V_{GS}=0V, di_{SD}/dt=100A/\mu s$	-	34	-	ns
$Q_{rr}$	Reverse Recovery Charge		-	22	-	nC

## Package Marking and Ordering Information

Device Marking	Device	Package	Packing Method	Tape width	Quantity
PGT075N030G	PGT075N030	PDFN5060	-	-	5000 unit

## Pin Description

Pin	Description	Simplified Outline
1, 2, 3	Source (S)	
4	Gate (G)	
5, 6, 7, 8	Drain (D)	

# Typical Characteristics

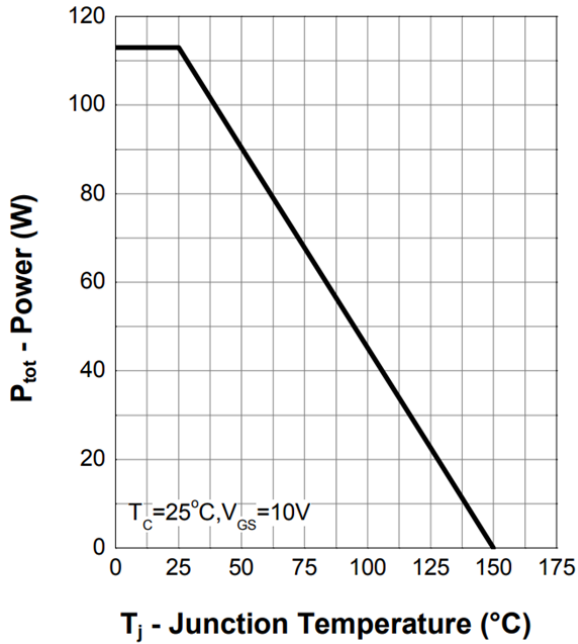


Figure 1. Power Capability

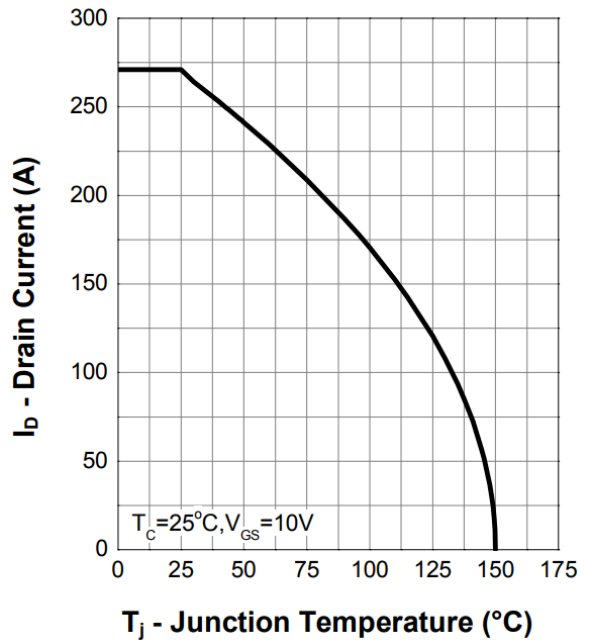


Figure 2. Current Capability

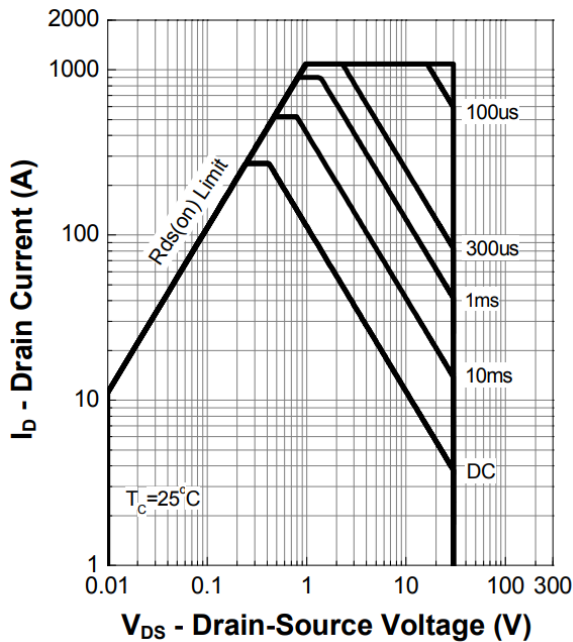


Figure 3. Safe Operating Area

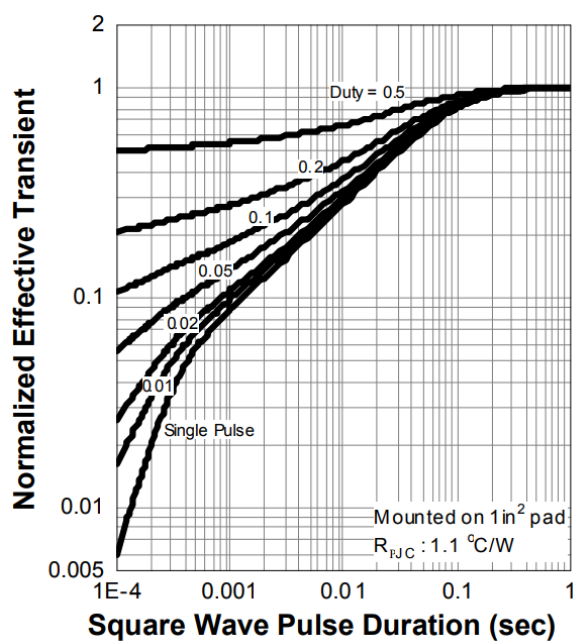


Figure 4. Transient Thermal Impedance

# Typical Characteristics

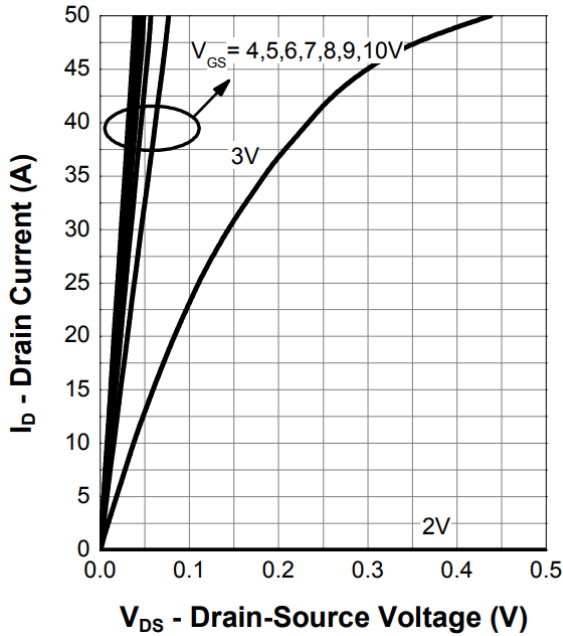


Figure 5. Output Characteristics

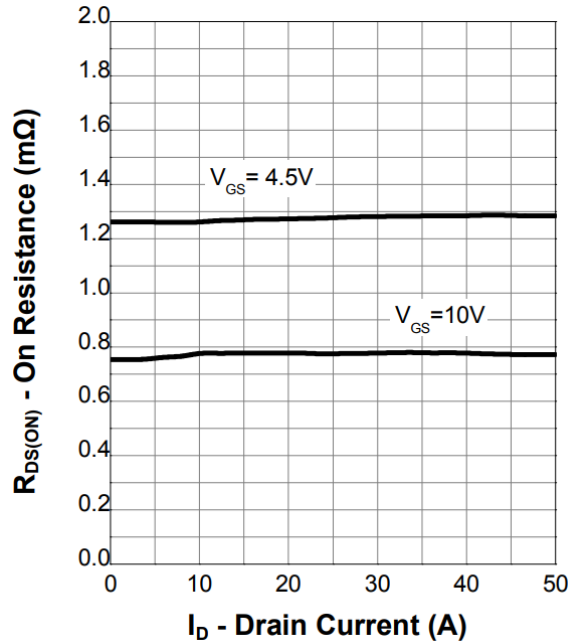


Figure 6. On-Resistance

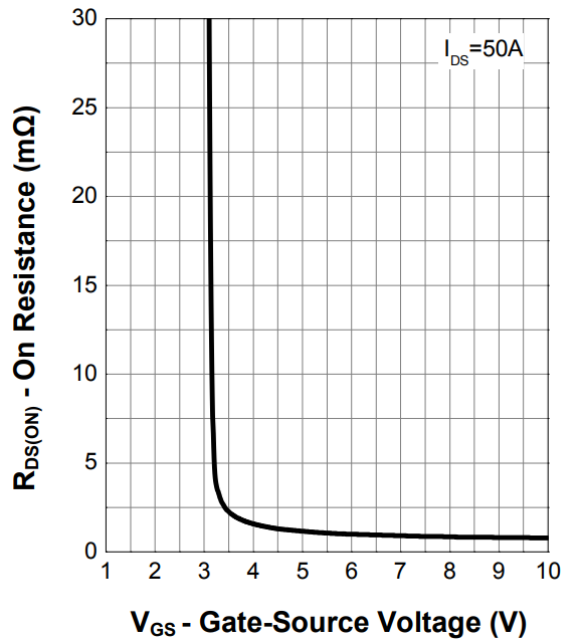


Figure 7. Transfer Characteristics

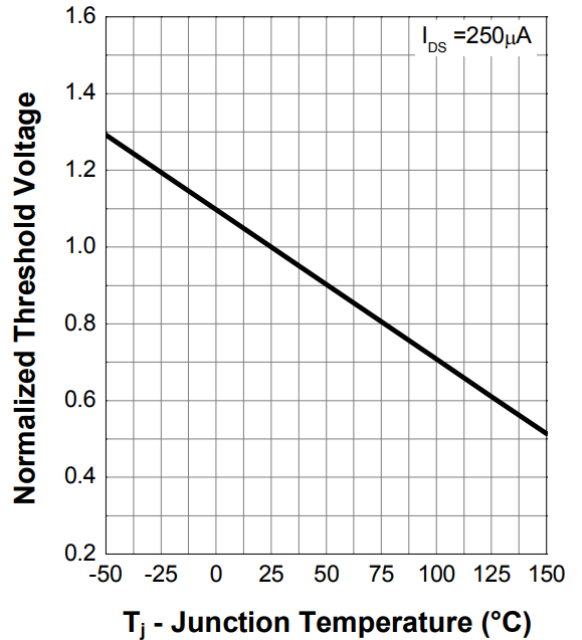
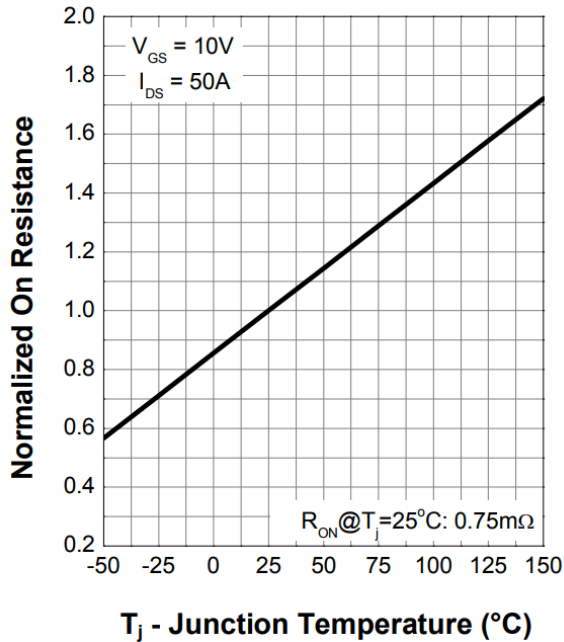
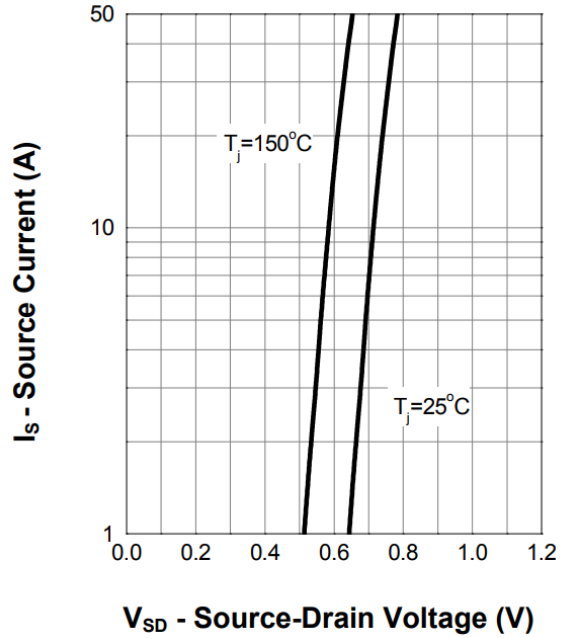


Figure 8. Normalized Threshold Voltage

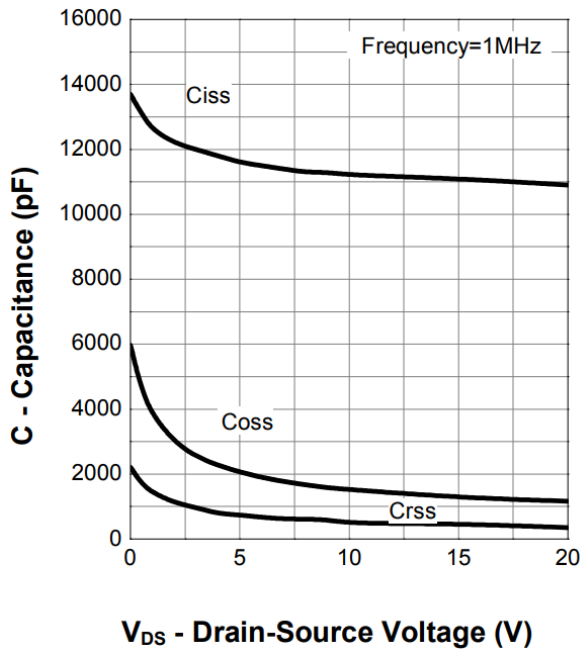
# Typical Characteristics



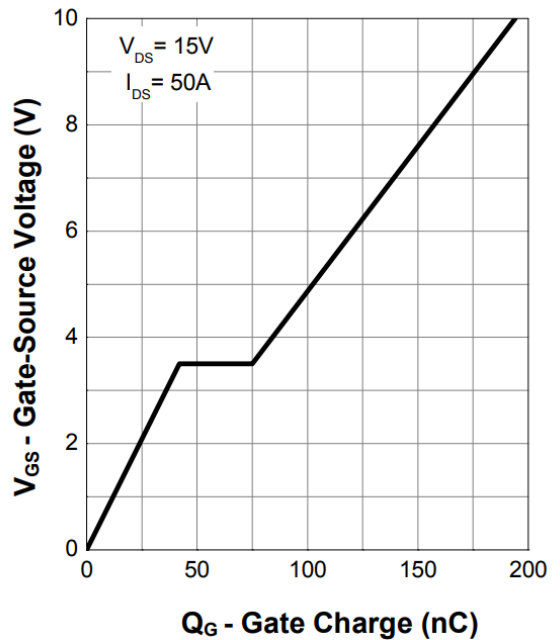
**T<sub>J</sub> - Junction Temperature (°C)**  
 Figure 9. Normalized On-Resistance



**V<sub>SD</sub> - Source-Drain Voltage (V)**  
 Figure 10. Diode Forward Current



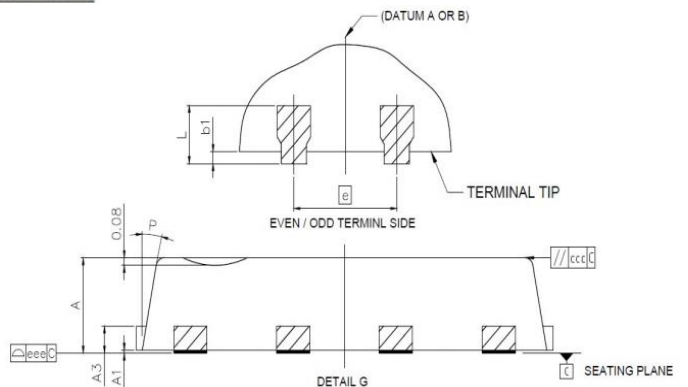
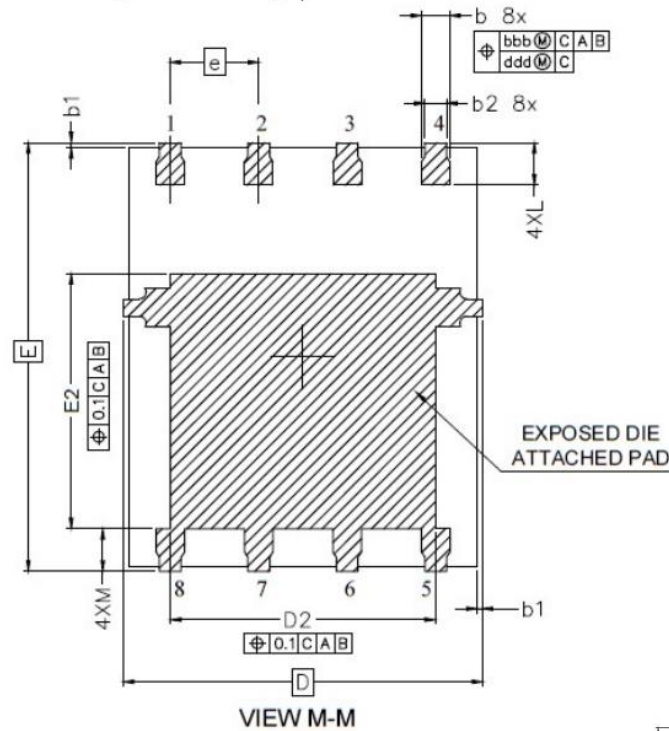
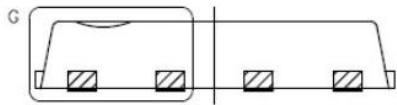
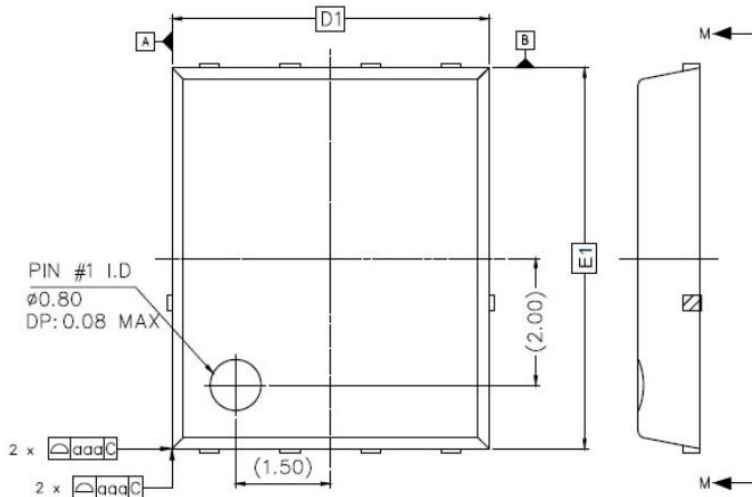
**V<sub>DS</sub> - Drain-Source Voltage (V)**  
 Figure 11. Capacitance



**Q<sub>G</sub> - Gate Charge (nC)**  
 Figure 12. Gate Charge

## Package Outline

Unit : mm



SYMBOL	DIMENSION		NOTES
	MIN	MAX	
A	0.95	1.05	
A1	0.00	0.05	
A3	0.254 REF		
b	0.31	0.51	
b1	0.03	0.13	
b2	0.21	0.41	
D	5.15 BSC		
D1	5.00 BSC		
D2	3.70	3.90	
E	6.15 BSC		
E1	6.00 BSC		
E2	3.56	3.76	
e	1.27 BSC		
L	0.51	0.71	
M	0.51	0.71	
P	10°	12°	
aaa	0.10		
bbb	0.10		
ccc	0.10		
ddd	0.05		
eee	0.08		