

P-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ Surface-mounted package
- ☒ Low gate charge

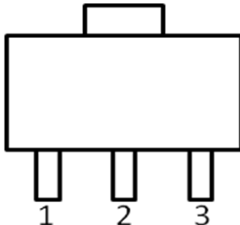
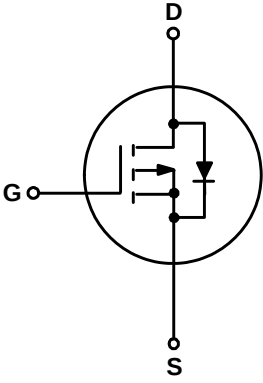
1.2 Applications

- ☒ Motor driver appliances
- ☒ Adapter appliances
- ☒ High power inverter system

1.3 Quick reference

- ☒ $BV \leq -60\text{ V}$
- ☒ $P_{tot} \leq 1.56\text{ W}$
- ☒ $I_D \leq -5\text{ A}$
- ☒ $R_{DS(ON)} \leq 90\text{ m}\Omega @ V_{GS} = -10\text{ V}$
- ☒ $R_{DS(ON)} \leq 120\text{ m}\Omega @ V_{GS} = -4.5\text{ V}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate(G)	 Top View SOT-89 -3L	
2	Drain(D)		
3	Source(S)		

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_A = 25\text{ }^{\circ}\text{C}$	-60	-	V
V_{GS}	Gate-Source Voltage	$T_A = 25\text{ }^{\circ}\text{C}$	-	± 20	V
I_D	Drain Current (DC)	$T_A = 25\text{ }^{\circ}\text{C}$, $V_{GS} = -10\text{ V}$	-	- 5	A
I_{DM}^*	Drain Current (Pulsed) *	$T_A = 25\text{ }^{\circ}\text{C}$, $V_{GS} = -10\text{ V}$	-	- 12.8	A
P_{tot}	Drain power dissipation	$T_A = 25\text{ }^{\circ}\text{C}$	-	1.56	W
T_{stg}	Storage Temperature		-55	150	$^{\circ}\text{C}$
T_J	Junction Temperature		-	150	$^{\circ}\text{C}$
I_S	Diode Forward Current	$T_A = 25\text{ }^{\circ}\text{C}$	-	- 5	A
$R_{\theta JA}^{**}$	Thermal Resistance- Junction to Ambient		-	80	$^{\circ}\text{C/W}$
$R_{\theta JC}^{***}$	Thermal Resistance- Junction to Case		-	2.5	

Notes :

- * Pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
- ** Mounted on PCB of 1 in^2 pad area
- *** Mounted on Large Heat Sink

4. Marking Information

Product Name	Marking
SN06P05Q	SN06P05Q YWWXXX YWWXXX: Date Code

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
SN06P05Q	SOT89-3L			1000	

6. Electrical Characteristics ($T_C=25\text{ }^{\circ}\text{C}$ Unless Otherwise Noted)

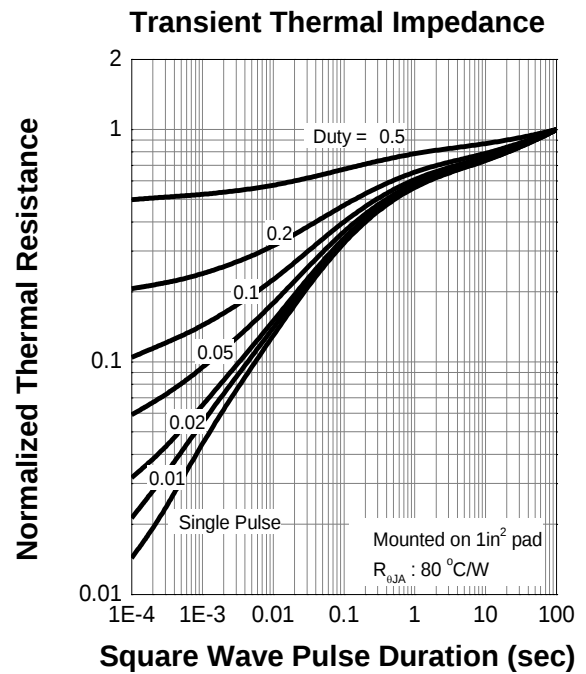
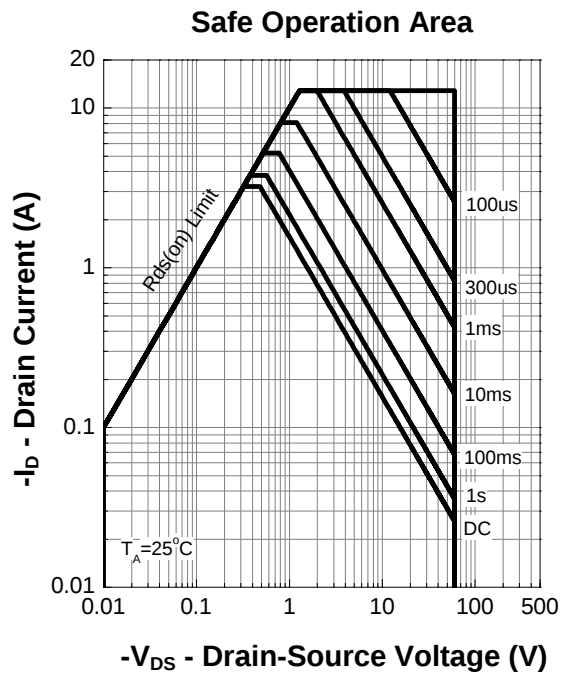
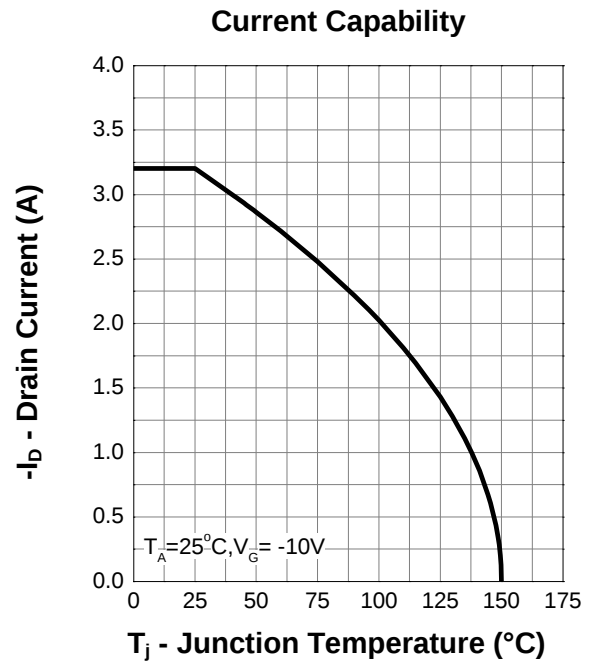
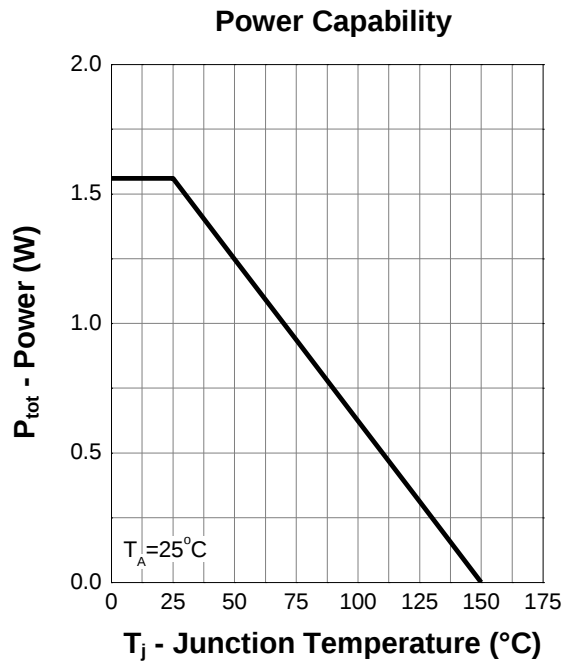
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _{DS} = - 250 μA	- 60	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _{DS} = - 250 μA	- 1.0	-	- 2.5	V
I _{DSS}	Drain Leakage Current	V _{DS} = - 48V , V _{GS} = 0 V	-	-	- 1.0	μA
I _{GSS}	Gate Leakage Current	V _{GS} = 0 V, V _{GS} = ± 20 V	-	-	±100	nA
R _{DS(ON)} ^a	On-State Resistance	V _{GS} = - 10 V, I _{DS} = - 2 A	-	80	90	mΩ
		V _{GS} = - 4.5 V, I _{DS} = - 1 A	-	105	120	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} = - 2 A, V _{GS} = 0 V	-	-	- 1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} = - 2 A, dI _{SD} / dt = 100 A / μs	-	15	-	nS
Q _{rr}	Reverse Recovery Charge		-	13	-	nC
Dynamic Characteristics ^b						
C _{iSS}	Input Capacitance	V _{GS} = 0 V, V _{DS} = - 30 V Frequency = 1 MHz	-	934	-	pF
C _{oSS}	Output Capacitance		-	44	-	
C _{rSS}	Reverse Transfer Capacitance		-	37	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} = - 30 V, V _{GEN} = - 10 V, R _G = 4.5 Ω, R _L = 15 Ω, I _{DS} = - 2 A	-	8.4	-	nS
t _r	Turn-on Rise Time		-	23	-	
t _{d(off)}	Turn-off Delay Time		-	109	-	
t _f	Turn-off Fall Time		-	48	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} = - 30 V, V _{GS} = - 10 V, I _{DS} = - 2 A	-	16	-	nC
Q _{gs}	Gate-Source Charge		-	3.8	-	
Q _{gd}	Gate-Drain Charge		-	1.8	-	

Notes :

a : Pulse test ; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

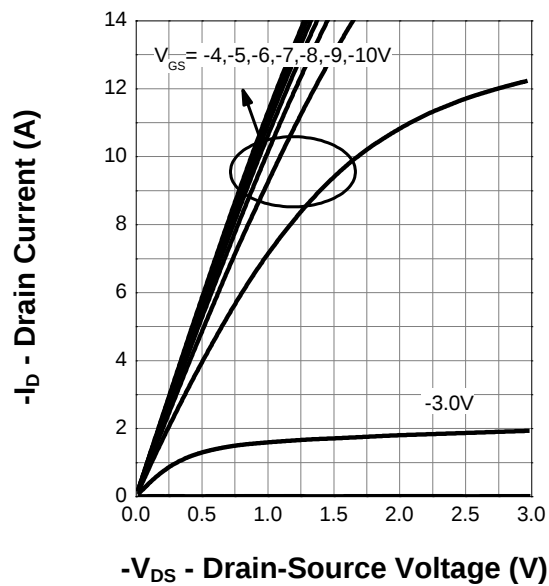
b : Guaranteed by design, not subject to production testing

7. Typical Characteristics (Cont.)

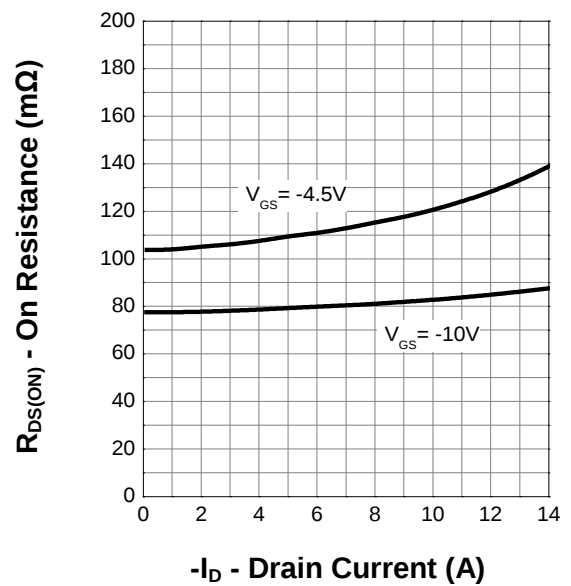


7. Typical Characteristics (Cont.)

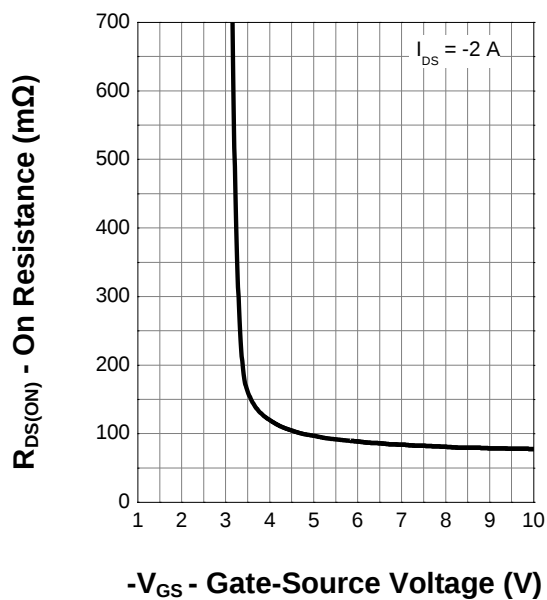
Output Characteristics



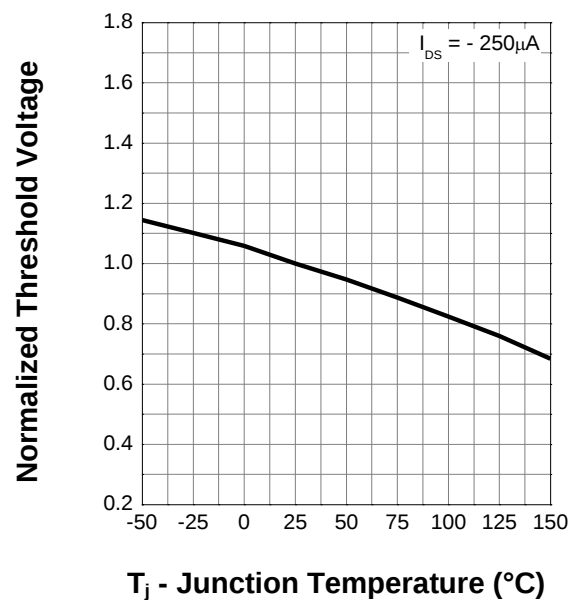
Drain-Source On Resistance



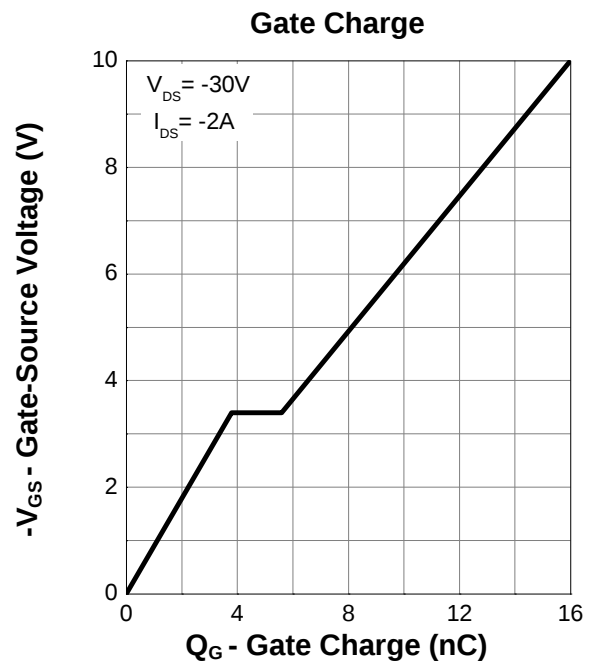
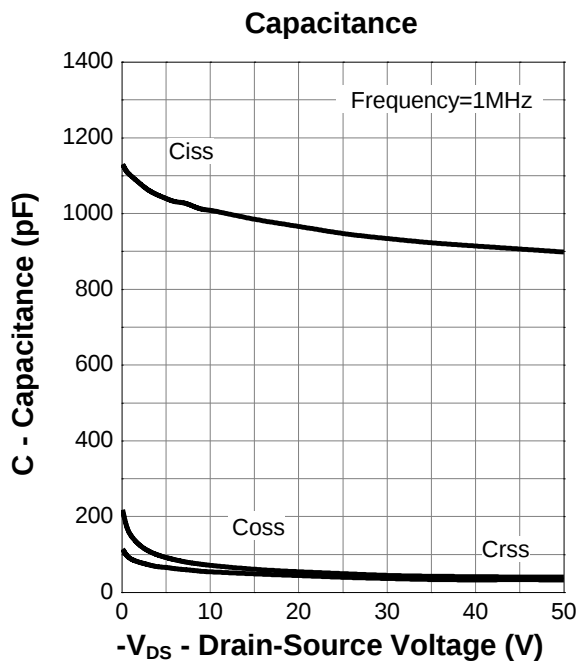
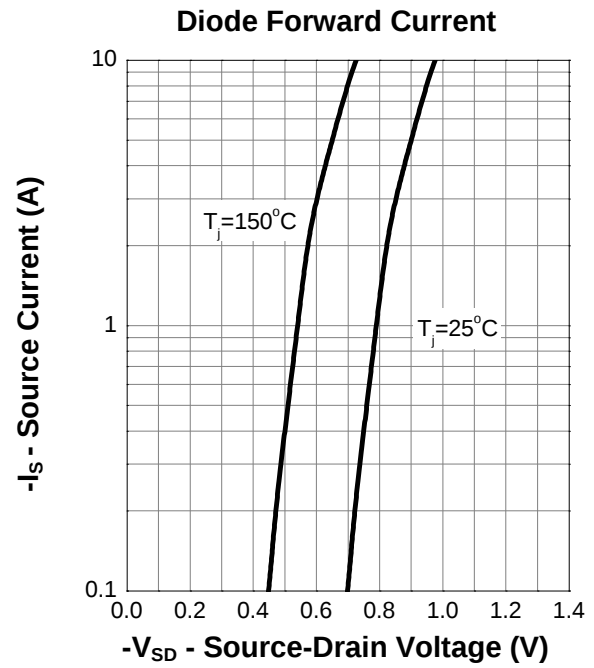
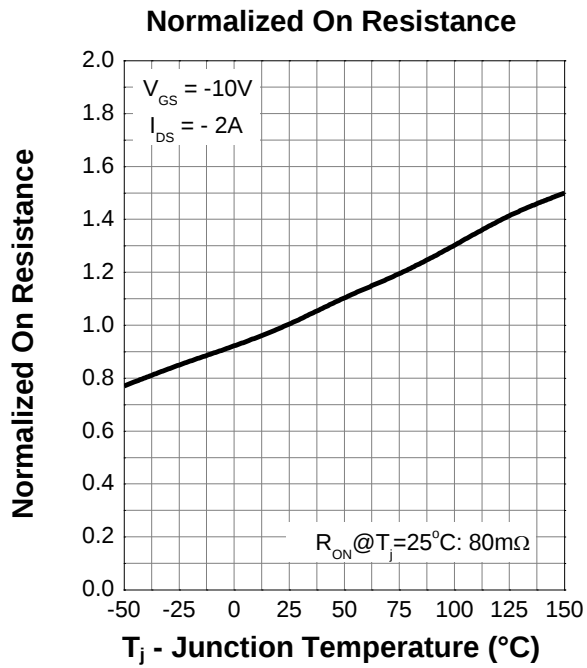
Transfer Characteristics



Normalized Threshold Voltage

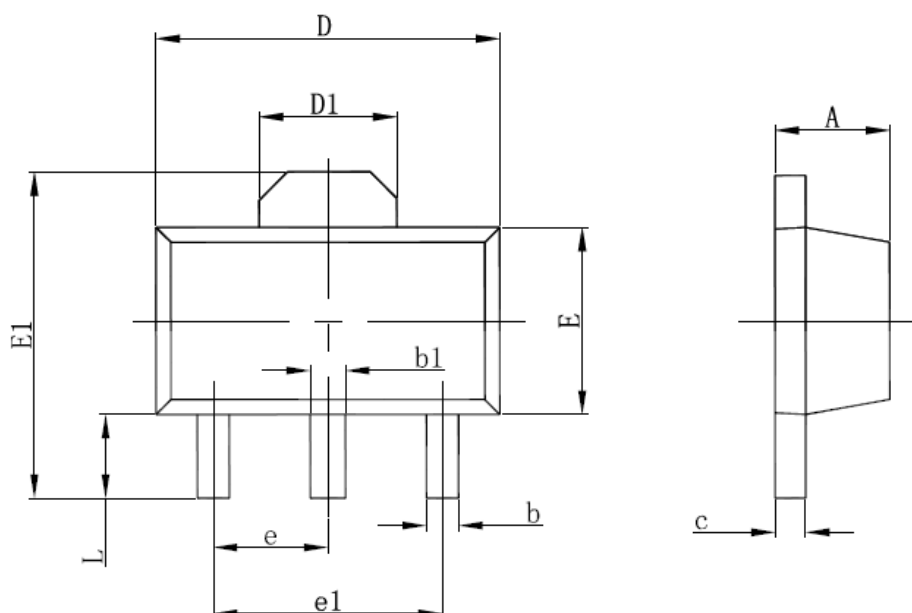


7. Typical Characteristics (Cont.)



8.Package Dimensions

SOT89-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047

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