

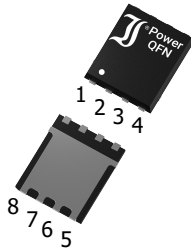
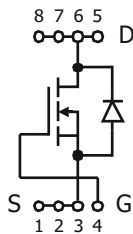
**DI080N06PQ**  
**N-Channel Power MOSFET**  
**N-Kanal Leistungs-MOSFET**

$I_{D25^{\circ}\text{C}}$  = 80 A  
 $R_{DS(\text{on})}$  ~ 3 m $\Omega$   
 $T_{j\text{max}}$  = 150°C

$V_{DSS}$  = 65 V  
 $P_D$  = 80 W  
 $E_{AS}$  = 240 mJ

Version 2020-07-05

**QFN5x6**  
 ~TDSO8-8

SPICE Model & STEP File <sup>1)</sup>

**Marking Code**  
 5E6N030

HS Code 85412100

**Typical Applications**

DC/DC Converters  
 Power Supplies  
 DC Drives  
 Power Tools  
 Synchronous Rectifiers  
 Commercial grade  
 Suffix -Q: AEC-Q101 compliant <sup>1)</sup>  
 Suffix -AQ: in AEC-Q101 qualification <sup>1)</sup>

**Features**

Low profile, space saving package  
 Low on state resistance  
 Fast switching times  
 Low gate charge  
 Avalanche rated  
 Compliant to RoHS (exemp. 7a),  
 REACH, Conflict Minerals <sup>1)</sup>

**Mechanical Data <sup>1)</sup>**

Taped and reeled 5000 / 13"  
 Weight approx. 0.1 g  
 Case material UL 94V-0  
 Solder & assembly conditions 260°C/10s  
 MSL = 1

**Typische Anwendungen**

Gleichstrom-Wandler  
 Stromversorgungen  
 Gleichstrom-Antriebe  
 Elektrowerkzeuge  
 Synchrongleichrichter  
 Standardausführung  
 Suffix -Q: AEC-Q101 konform <sup>1)</sup>  
 Suffix -AQ: in AEC-Q101 Qualifikation <sup>1)</sup>

**Besonderheiten**

Flache, platzsparende Bauform  
 Niedriger Einschaltwiderstand  
 Schnelle Schaltzeiten  
 Niedrige Gate-Ladung  
 Avalanche-Charakteristik  
 Konform zu RoHS (Ausn. 7a),  
 REACH, Konfliktmineralien <sup>1)</sup>

**Mechanische Daten <sup>1)</sup>**

Gegurtet auf Rolle  
 Gewicht ca.  
 Gehäusematerial  
 Löt- und Einbaubedingungen

**Maximum ratings <sup>1)</sup>****Grenzwerte <sup>2)</sup>**

			<b>DI080N06PQ/-AQ</b>
Drain-Source voltage – Drain-Source-Spannung	$V_{GS} = 0 \text{ V (short)}$	$V_{DSS}$	65 V
Gate-Source-voltage continuous – Gate-Source-Spannung dauernd		$V_{GSS}$	$\pm 20 \text{ V}$
Power dissipation – Verlustleistung	$T_C = 25^{\circ}\text{C}^2)$	$P_{\text{tot}}$	80 W
Drain current continuous – Drainstrom dauernd	$T_C = 25^{\circ}\text{C}^3)$	$I_D$	80 A
Drain current continuous – Drainstrom dauernd	$T_C = 100^{\circ}\text{C}^3)$	$I_D$	73 A
Peak Drain current – Drain-Spitzenstrom	<sup>3)</sup>	$I_{DM}$	300 A
Source current continuous – Sourcestrom dauernd	$T_C = 25^{\circ}\text{C}^3)$	$I_S$	55 A
Peak Source current – Source-Spitzenstrom	$V_{GS} = 0 \text{ V}, t_p = 10 \text{ ms}$	$I_{SM}$	150 A
Single pulse avalanche energy Einzelpuls Avalanche-Energie (Fig. 1)	$V_{DD} = 30 \text{ V}, V_G = 10 \text{ V}$ $L = 0.5 \text{ mH}, R_G = 25 \Omega$	$E_{AS}$	240 mJ
Junction temperature – Sperrschichttemperatur		$T_J$	-55...+150°C
Storage temperature – Lagerungstemperatur		$T_S$	-55...+150°C

<sup>1</sup> Please note the [detailed information on our website](#) or at the beginning of the data book  
 Bitte beachten Sie die [detaillierten Hinweise auf unserer Internetseite](#) bzw. am Anfang des Datenbuches

<sup>1</sup>  $T_A = 25^{\circ}\text{C}$ , unless otherwise specified –  $T_A = 25^{\circ}\text{C}$ , wenn nicht anders angegeben

<sup>2</sup> Measured at heat flange – Gemessen an der Kühlfahne

<sup>3</sup> Pulse width refer to SOA diagram – Pulsbreite siehe SOA-Diagramm

**Characteristics (static)**
**Kennwerte (statisch)**

		$T_j = 25^\circ\text{C}$	Min.	Typ.	Max.
Drain-Source breakdown voltage – Drain-Source-Durchbruchspannung $I_D = 250 \mu\text{A}$ $V_{GS} = 0 \text{ V}$ (short)		$V_{(BR)DSS}$	65 V	–	–
Drain-Source leakage current – Drain-Source Leckstrom $V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$ (short)		$I_{DSS}$	–	–	1 $\mu\text{A}$
Gate-Body leakage current – Gate-Substrat Leckstrom $V_{GS} = \pm 20 \text{ V}$ $V_{DS} = 0 \text{ V}$ (short)		$I_{GSS}$	–	–	$\pm 100 \text{ nA}$
Gate-Source threshold voltage – Gate-Source Schwellspannung $V_{GS} = V_{DS}$ $I_D = 250 \mu\text{A}$		$V_{GS(th)}$	1 V	2 V	3 V
Drain-Source on-state resistance – Drain-Source Einschaltwiderstand $V_{GS} = 10 \text{ V}$ $I_D = 30 \text{ A}$ $V_{GS} = 4.5 \text{ V}$ $I_D = 20 \text{ A}$		$R_{DS(on)}$	–	3 m $\Omega$ –	4 m $\Omega$ 6.5 m $\Omega$

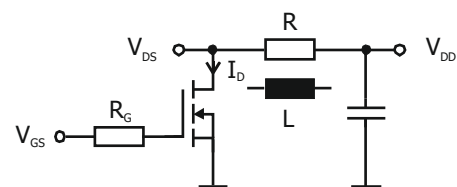
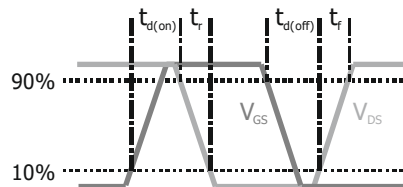
**Characteristics (dynamic)**
**Kennwerte (dynamisch)**

		$T_j = 25^\circ\text{C}$	Min.	Typ.	Max.
Forward Transconductance – Übertragungsteilheit $V_{DS} = 5 \text{ V}$ $I_D = 20 \text{ A}$		$g_{FS}$	–	140 S	–
Input Capacitance – Eingangskapazität $V_{DS} = 30 \text{ V}$ $V_{GS} = 0 \text{ V}$ $f = 1 \text{ MHz}$		$C_{iss}$	–	3500 pF	–
Output Capacitance – Ausgangskapazität $V_{DS} = 30 \text{ V}$ $V_{GS} = 0 \text{ V}$ $f = 1 \text{ MHz}$		$C_{oss}$	–	700 pF	–
Reverse Transfer Capacitance – Rückwirkungskapazität $V_{DS} = 30 \text{ V}$ $V_{GS} = 0 \text{ V}$ $f = 1 \text{ MHz}$		$C_{rss}$	–	100 pF	–
Turn-On Delay & Rise Time – Einschaltverzögerung und Anstiegszeit $V_{DD} = 30 \text{ V}$ $I_D = 1 \text{ A}$ $V_{GS} = 10 \text{ V}$ $R_G = (1.6) 6 \Omega$ (Fig. 1)		$t_{d(on)}$ $t_r$	–	(10) 22 ns (6) 9 ns	–
Turn-Off Delay & Fall Time – Ausschaltverzögerung und Abfallzeit $V_{DD} = 30 \text{ V}$ $I_D = 1 \text{ A}$ $V_{GS} = 0 \text{ V}$ $R_G = (1.6) 6 \Omega$ (Fig. 1)		$t_{d(off)}$ $t_f$	–	(30) 64 ns (7) 74 ns	–
Total Gate Charge – Gesamte Gate-Ladung $V_{DD} = 30 \text{ V}$ $I_D = 40 \text{ A}$ $V_{GS} = 10 \text{ V}$		$Q_g$	–	56 nC	–
Gate-Source Charge – Gate-Source-Ladung $V_{DD} = 30 \text{ V}$ $I_D = 40 \text{ A}$ $V_{GS} = 10 \text{ V}$		$Q_{gs}$	–	13 nC	–
Gate-Drain Charge – Gate-Drain-Ladung $V_{DD} = 30 \text{ V}$ $I_D = 40 \text{ A}$ $V_{GS} = 10 \text{ V}$		$Q_{gd}$	–	8 nC	–
Intrinsic Gate resistance – Innerer Gatewiderstand $f = 1 \text{ MHz}$ D open		$R_{Gi}$	–	1 $\Omega$	–

**Fig. 1**

Test circuit for switching times (R) and avalanche energy (L)  
("rise" and "fall" refer to  $I_D$ )

Testaufbau für Schaltzeiten (R) und Avalanche-Energie (L)  
("rise" und "fall" beziehen sich auf  $I_D$ )



**Characteristics (diode)**

**Kennwerte (Diode)**

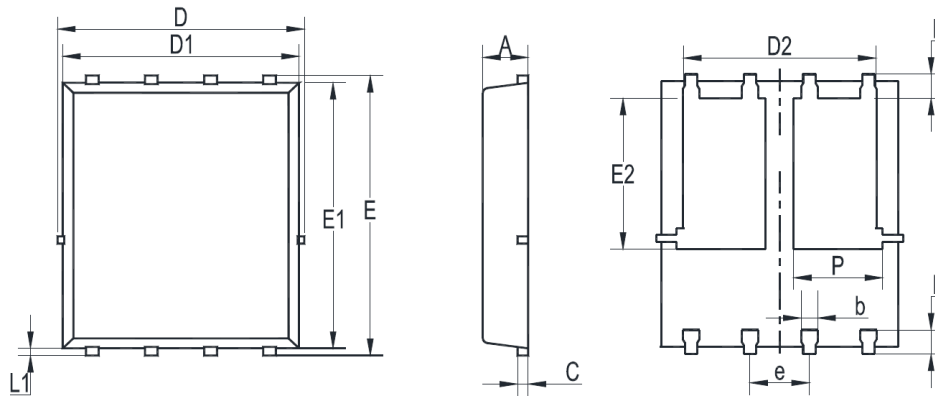
		$T_j = 25^\circ\text{C}$	Min.	Typ.	Max.
Forward voltage – Durchlass-Spannung $V_{GS} = 0\text{ V}$ $I_S = 20\text{ A}$		$V_{SD}$	–	0.8 V	1.3 V
Reverse recovery time – Sperrverzugszeit $I_S = 40\text{ A}$ , $di/dt = -100\text{ A}/\mu\text{s}$		$t_{rr}$	–	42 ns	–
Reverse recovery charge – Sperrverzugsladung $I_S = 40\text{ A}$ , $di/dt = -100\text{ A}/\mu\text{s}$		$Q_{rr}$	–	48 nC	–

**Characteristics (thermal)**

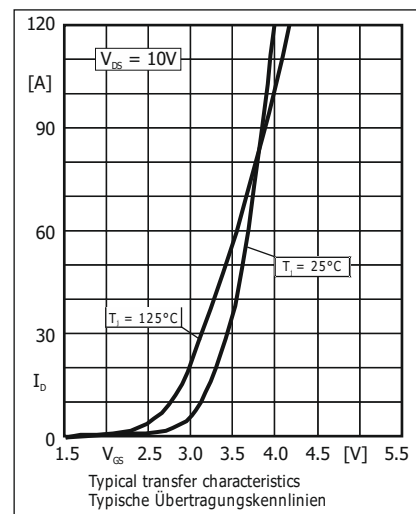
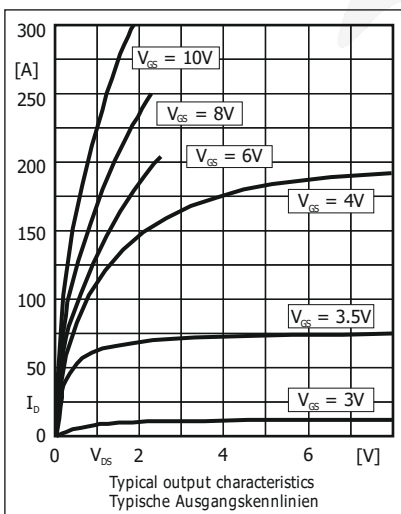
**Kennwerte (thermisch)**

		Min.	Typ.	Max.	
Thermal resistance junction to case Wärmewiderstand Sperrschicht – Gehäuse		$R_{thc}$	–	1.3 K/W <sup>1)</sup>	–

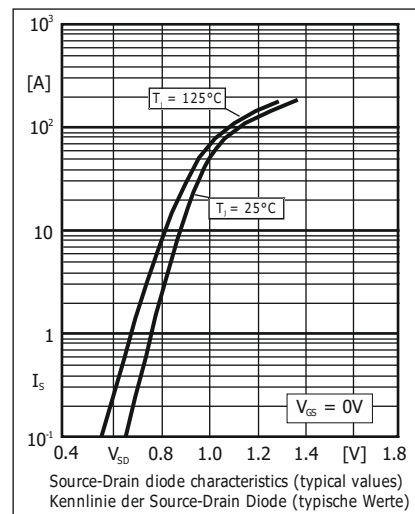
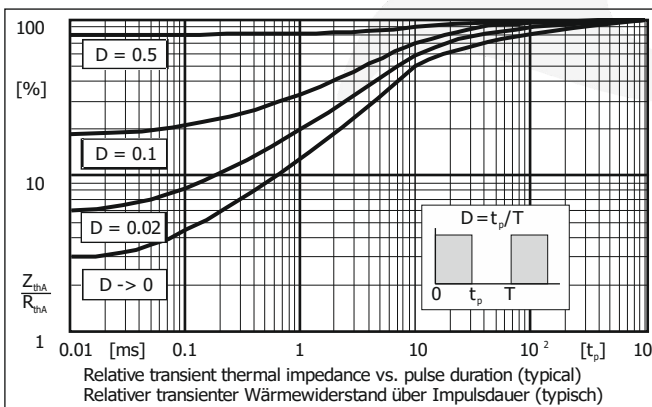
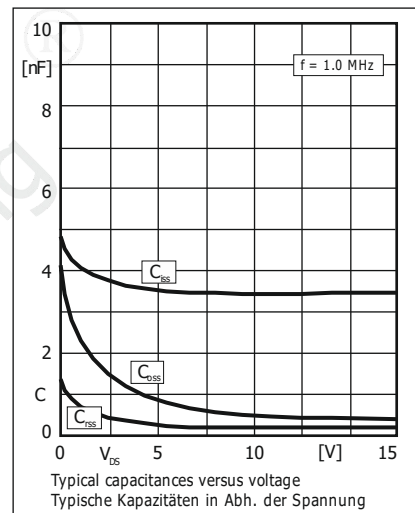
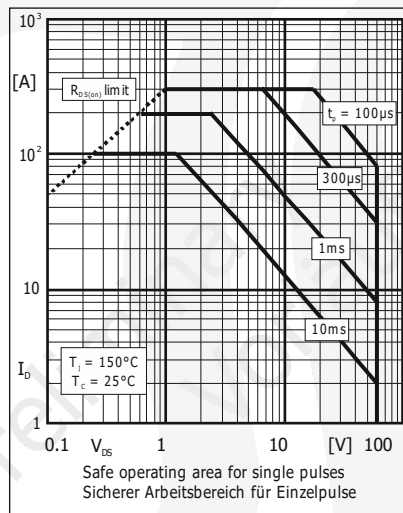
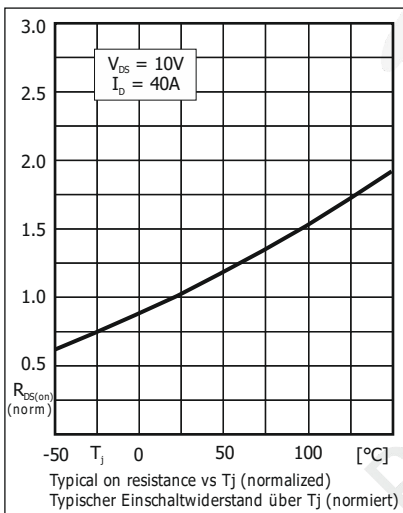
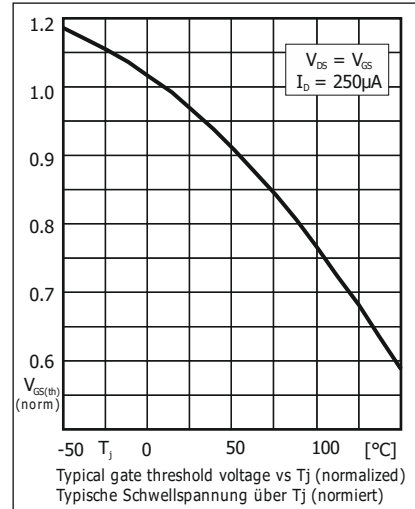
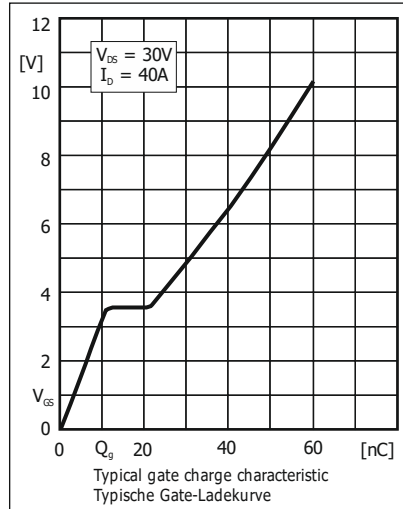
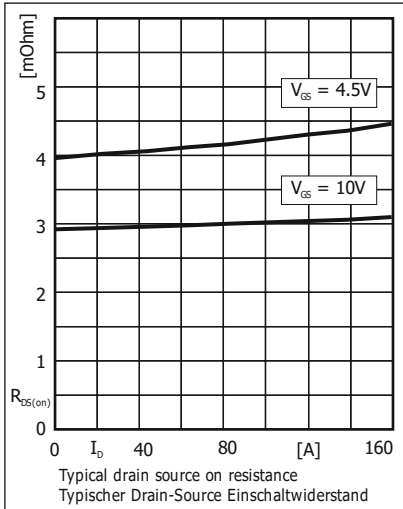
**Dimensions - Maße [mm]**



Unit	A	b	C	D	D1	D2	E	E1	E2	e	L	L1	H	P
mm	1.12 0.9	0.51 0.33	0.34 0.11	5.26 4.7	5.1 4.7	4.5 3.56	6.25 5.75	6 5.6	3.66 3.18	1.37 1.17	0.71 0.35	0.2 0.06	0.71 0.35	2.3 1.7



1 Measured towards heat sink area (Drain) – Gemessen zur Kühlfläche (Drain)



**Disclaimer:** See data book page 2 or [website](#)  
**Haftungsausschluss:** Siehe Datenbuch Seite 2 oder [Internet](#)