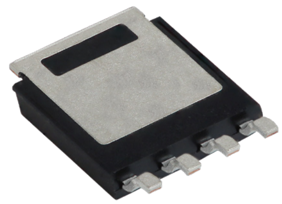
MIGRATION GUIDE

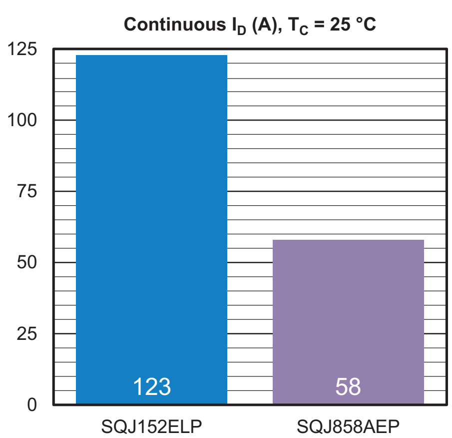
SQJ152ELP MOSFET

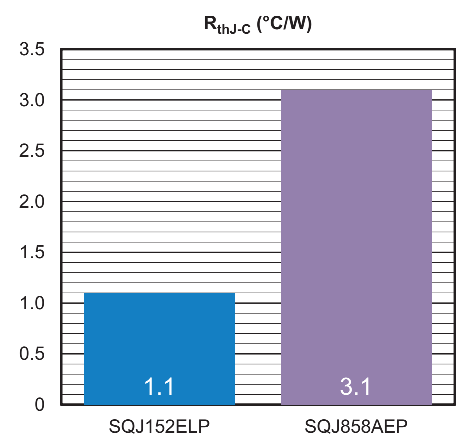
Vishay Automotive Grade SQJ152ELP MOSFET, 40 V, 5.5 mΩ in PowerPAK® SO-8L

- Class-leading $R_{DS(on)}$ - Q_g FOM at V_{GS} = 4.5 V saves energy in automotive applications
- Includes the following key performance-improving features:
  - Latest 40 V TrenchFET® Gen IV technology
  - New materials for lower thermal resistance
  - New lead frame designs for extended board-level reliability



The Vishay Siliconix SQJ152ELP MOSFET provides a technically advanced upgrade to the SQJ858AEP. The device's package construction employs a wire-free design that extends the MOSFET's drain current capabilities, while reducing its thermal resistance. Compared to the SQJ858AEP, the SQJ152ELP's continuous drain current rating has increased by 112 %.

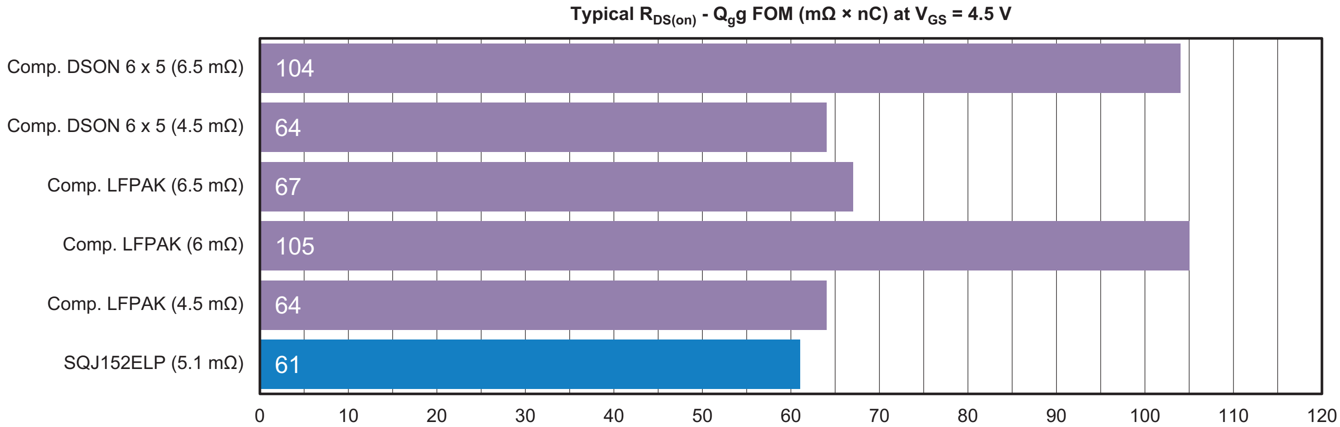




In addition to improved packaging material, the SQJ152ELP features the latest TrenchFET Gen IV technology and provides a 44 % lower $R_{DS(on)}$ - Q_g figure of merit (FOM) than the SQJ858AEP.

Part Number	Package	V_{DS} (V)	V_{GS} (V)	$R_{DS(on)}$ at 10 V (mΩ)		$R_{DS(on)}$ at 4.5 V (mΩ)		Q_g (nC)		Q_{gd} (nC)	Q_{gs} (nC)	C_{oss} (pF)	$R_{DS(on)}$ - Q_g (mΩ × nC)	
				Typ.	Max.	Typ.	Max.	10 V	4.5 V				10 V	4.5 V
SQJ152ELP	PowerPAK SO-8L	40	± 20	4	5.1	5.5	7.5	22.5	11	4.3	4	412	90	61
SQJ858AEP	PowerPAK SO-8L	40	± 20	5	6.3	6	7.5	36	18	6	8	295	180	108

The SQJ152ELP's typical $R_{DS(ON)}$ - Q_g FOM at a V_{GS} of 4.5 V is 61 mΩ × nC, which is the lowest among similar products with $R_{DS(ON)}$ of 4.5 mΩ to 6.5 mΩ. Its 38 % lower Q_g reduces gate driver related power losses and contributes to the class-leading FOM, which is 5 % lower than the next best product on the market.



In addition to its improved electrical parameters, the PowerPAK® SO-8L package offers proven board-level reliability capabilities. Its internal construction and external gullwing leads are engineered for maximum stress relief during extremes of thermal and mechanical stress. The package has passed extended powered temperature cycling and rapid temperature cycling, as well as PCB flexing and vibration tests.

Combining upgraded performance figures and robustness, the SQJ152ELP is well-suited to replace the SQJ858AEP in new designs for multiple automotive applications, including solid state relays, high side switches, motor drive controls, and other safety and convenience systems.

Performance Highlights

- Class-leading $R_{DS(on)}$ - Q_g FOM of 61 mΩ × nC at a V_{GS} of 4.5 V
- Wire-free construction reduces parasitic inductance
- Test-proven, enhanced board-level reliability
- Passed power temperature cycling, board dropping, flexing, and vibration tests

The detailed comparison of critical parameters is on the next page.

SQJ152ELP AND SQJ858EP COMPARISON TABLE

Parameters	Test Conditions		Min.		Typ.		Max.		Unit
	SQJ152ELP	SQJ858AEP	SQJ152ELP	SQJ858AEP	SQJ152ELP	SQJ858AEP	SQJ152ELP	SQJ858AEP	
V_{DS}	V_{GS} = 0 V, I_D = 250 μA		40	40	-	-	-	-	V
V_{GS}	Absolute max.		-20	-20	-	-	20	20	
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA		1.5	1.5	2	2	2.5	2.5	
I_D	T_C = 25 °C		-	-	-	-	123	58	A
	T_C = 125 °C		-	-	-	-	71	33	
I_{AS}	L = 0.1 mH		-	-	-	-	14	35	
E_{AS}	L = 0.1 mH		-	-	-	-	9.8	61	mJ
P_D	T_C = 25 °C		-	-	-	-	136	48	W
	T_C = 125 °C		-	-	-	-	45	16	
T_J, T_{stg}	Absolute max.		-55	-55	-	-	175	175	°C
R_{thJA}	T_A = 25 °C		-	-	-	-	42	85	°C/W
R_{thJC}	T_C = 25 °C		-	-	-	-	1.1	3.1	
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 14 A, T_J = 25 °C	V_{GS} = 10 V, I_D = 14 A, T_J = 25 °C	-	-	4	5	5.1	6.3	mΩ
	V_{GS} = 4.5 V, T_J = 25 °C	V_{GS} = 4.5 V, I_D = 10 A, T_J = 25 °C	-	-	5.5	6	7.5	7.5	
Q_g	V_{GS} = 10 V, V_{DS} = 20 V, I_D = 15 A	V_{GS} = 10 V, V_{DS} = 20 V, I_D = 20 A	-	-	22.5	36	34	55	nC
Q_{gs}			-	-	4	8	-	-	
Q_{gd}			-	-	4.3	6	-	-	
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	V_{GS} = 0 V, V_{DS} = 20 V, f = 1 MHz	-	-	1166	1951	1633	2450	pF
C_{oss}			-	-	412	295	577	370	
C_{rss}			-	-	57	110	80	140	
R_g	f = 1 MHz	f = 1 MHz	3.5	1.5	5.9	2.97	9.4	4.5	Ω
$t_{d(on)}$	V_{DD} = 20 V, R_L = 1.33 Ω, I_D = 15 A, V_{GEN} = 10 V, R_g = 1 Ω	V_{DD} = 20 V, R_L = 2 Ω, I_D = 10 A, V_{GEN} = 10 V, R_g = 1 Ω	-	-	9.6	10	13.5	15	ns
t_r			-	-	4.3	9	6.1	14	
$t_{d(off)}$			-	-	25	26	35	40	
t_f			-	-	8.5	8	12	12	
V_{SD}	V_{GS} = 0 V, I_F = 15 A		-	-	-	0.8	1.1	1.1	V