



P-channel -60V, -12A, TO-252 Power MOSFET 功率場效應管

■ **Features 特點**

Low on-resistance and maximum DC current capability 低導通電阻和最大直流電流能力

Super high density cell design 超高元胞密度設計

$R_{DS(ON)} < 115m\Omega @ V_{GS} = -10V$

$R_{DS(ON)} < 150m\Omega @ V_{GS} = -4.5V$

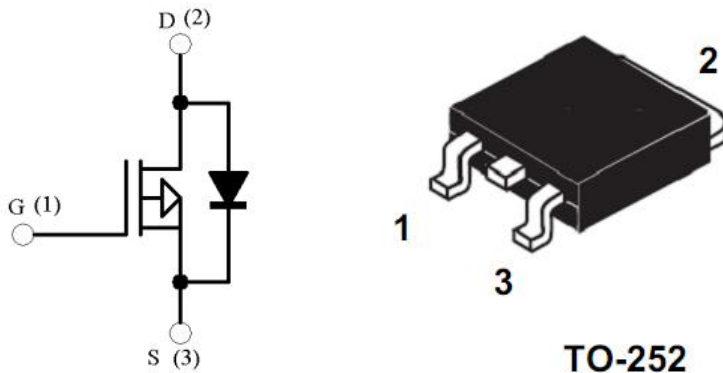
■ **Applications 應用**

Switch mode power supplies 開關電源

DC-DC converters 直流直流變換

General switching applications 普通開關應用

■ **Internal Schematic Diagram 內部結構**



■ **Absolute Maximum Ratings 最大額定值**

Characteristic 特性參數	Symbol 符號	Rat 額定值	Unit 單位
Drain-Source Voltage 漏極-源極電壓	BV_{DSS}	-60	V
Gate- Source Voltage 柵極-源極電壓	V_{GS}	± 20	V
Drain Current (continuous)漏極電流-連續	I_D (at $T_C = 25^\circ C$)	-12	A
Drain Current (pulsed)漏極電流-脈沖	I_{DM}	-30	A
Total Device Dissipation 總耗散功率	P_{TOT} (at $T_C = 25^\circ C$)	50	W
Thermal Resistance Junction-Ambient 熱阻	$R_{\theta JA}$	2.5	$^\circ C/W$
Junction/Storage Temperature 結溫/儲存溫度	T_J, T_{stg}	-50~150	$^\circ C$



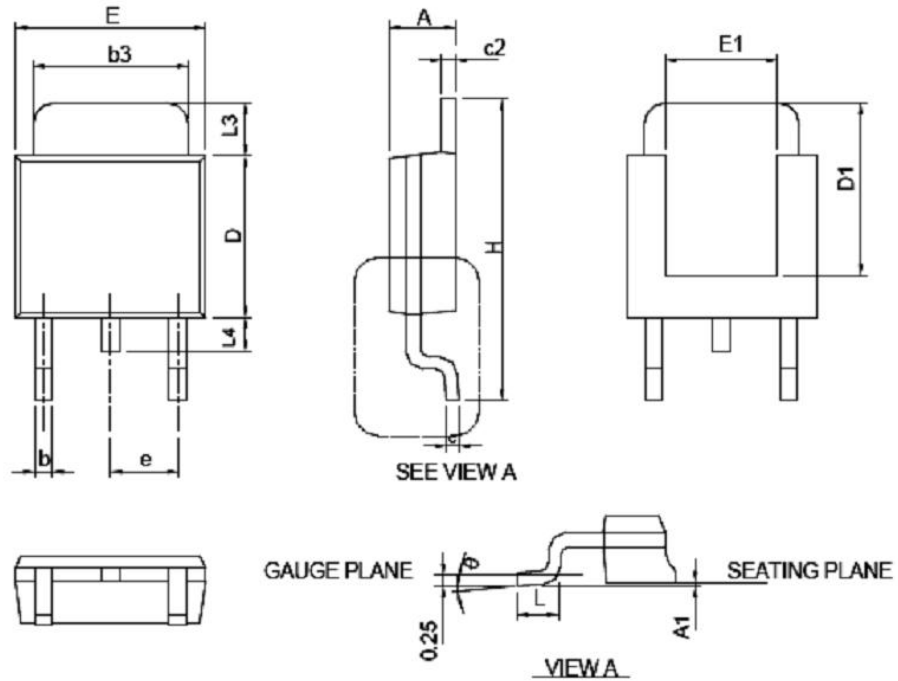
■ Electrical Characteristics 電特性

($T_A=25^{\circ}\text{C}$ unless otherwise noted 如無特殊說明，溫度為 25°C)

Characteristic 特性參數	Symbol 符號	Min 最小值	Typ 典型值	Max 最大值	Unit 單位
Drain-Source Breakdown Voltage 漏極-源極擊穿電壓($I_D=-250\mu\text{A}, V_{GS}=0\text{V}$)	BV_{DSS}	-60	—	—	V
Gate Threshold Voltage 柵極開啓電壓($I_D=-250\mu\text{A}, V_{GS}=V_{DS}$)	$V_{GS(th)}$	-1	-2	-3	V
Zero Gate Voltage Drain Current 零柵壓漏極電流($V_{GS}=0\text{V}, V_{DS}=-48\text{V}$)	I_{DSS}	—	—	-1	μA
Gate Body Leakage 柵極漏電流($V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$)	I_{GSS}	—	—	± 100	nA
Static Drain-Source On-State Resistance 靜態漏源導通電阻($I_D=-12\text{A}, V_{GS}=-10\text{V}$) ($I_D=-8\text{A}, V_{GS}=-4.5\text{V}$)	$R_{DS(on)}$	—	91 114	115 150	$\text{m}\Omega$
Source Drain Current 源極-漏極電流	I_{SD}	—	—	-12	A
Diode Forward Voltage Drop 內附二極管正向壓降($I_{SD}=-1\text{A}, V_{GS}=0\text{V}$)	V_{SD}	—	—	-1	V
Input Capacitance 輸入電容 ($V_{GS}=0\text{V}, V_{DS}=-30\text{V}, f=1\text{MHz}$)	C_{ISS}	—	980	—	pF
Common Source Output Capacitance 共源輸出電容($V_{GS}=0\text{V}, V_{DS}=-30\text{V}, f=1\text{MHz}$)	C_{OSS}	—	110	—	pF
Reverse Transfer Capacitance 回饋電容($V_{GS}=0\text{V}, V_{DS}=-30\text{V}, f=1\text{MHz}$)	C_{RSS}	—	50	—	pF
Total Gate Charge 總柵電荷密度 ($V_{DS}=-30\text{V}, I_D=-12\text{A}, V_{GS}=-10\text{V}$)	Q_g	—	18	—	nC
Gate Source Charge 柵源電荷密度 ($V_{DS}=-30\text{V}, I_D=-12\text{A}, V_{GS}=-10\text{V}$)	Q_{gs}	—	3	—	nC
Gate Drain Charge 柵漏電荷密度 ($V_{DS}=-30\text{V}, I_D=-12\text{A}, V_{GS}=-10\text{V}$)	Q_{gd}	—	5	—	nC
Turn-On Delay Time 開啓延遲時間 ($V_{DS}=-30\text{V}, I_D=-1\text{A}, R_{GEN}=3\Omega, V_{GS}=-10\text{V}$)	$t_{d(on)}$	—	9	—	ns
Turn-On Rise Time 開啓上升時間 ($V_{DS}=-30\text{V}, I_D=-1\text{A}, R_{GEN}=3\Omega, V_{GS}=-10\text{V}$)	t_r	—	10	—	ns
Turn-Off Delay Time 關斷延遲時間 ($V_{DS}=-30\text{V}, I_D=-1\text{A}, R_{GEN}=3\Omega, V_{GS}=-10\text{V}$)	$t_{d(off)}$	—	25	—	ns
Turn-On Fall Time 開啓下降時間 ($V_{DS}=-30\text{V}, I_D=-1\text{A}, R_{GEN}=3\Omega, V_{GS}=-10\text{V}$)	t_f	—	11	—	ns



■ DIMENSION 外形封裝尺寸



SYMBOL	TO-252			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.39	0.086	0.094
A1		0.13		0.005
b	0.50	0.89	0.020	0.035
b3	4.95	5.46	0.195	0.215
c	0.46	0.61	0.018	0.024
c2	0.46	0.89	0.018	0.035
D	5.33	6.22	0.210	0.245
D1	4.57	6.00	0.180	0.236
E	6.35	6.73	0.250	0.265
E1	3.81	6.00	0.150	0.236
e	2.29 BSC		0.090 BSC	
H	9.40	10.41	0.370	0.410
L	0.90	1.78	0.035	0.070
L3	0.89	2.03	0.035	0.080
L4		1.02		0.040
0	0°	8°	0°	8°